jsonToBatProject

Generated on Mon Feb 26 2024 16:05:03 for jsonToBatProject by Doxygen 1.9.8

Mon Feb 26 2024 16:05:03

Chapter 1

README

Doxygen Documentation

Sonar Cloud

1.1 README

1.1.1 Current workflows:

- build
  - build and test the application on:
    - windows with cl
    - ubunut with g++
    - ubuntu with clang++
- CodeQl
  - Code security
- Doxygen Action
  - Generate Doxygen documentation
  - Deploys generated documentation to gh-pages
- Microsoft C++ Code Analysis
- pages-build-deployment
- SonarCloud
  - Static code analysis *For Scanning Alerts -> Security*

1.1.2 Regarding coding style (?):

- no classes in global namespace
- no "using NAMESPACE"
- 4 space indenting
- ? *setup astyle options?*

1.1.3 Git (?):

- no direct commits onto main (only via pull-requests)

Chapter 2

Deprecated List

Class Json::FastWriter
Use StreamWriterBuilder.

Class Json::Reader
Use CharReader and CharReaderBuilder.

Global Json::Reader::getFormatedErrorMessages () const
Use getFormattedErrorMessages() instead (typo fix).

Global Json::Reader::Reader ()
Use CharReader and CharReaderBuilder.

Global Json::Reader::Reader (const Features &features)
Use CharReader and CharReaderBuilder.

Class Json::StyledStreamWriter
Use StreamWriterBuilder.

Class Json::StyledWriter
Use StreamWriterBuilder.

Global Json::Value::setComment (const char *comment, CommentPlacement placement)
Always pass len.

Global Json::ValueIteratorBase::memberName () const
This cannot be used for UTF-8 strings, since there can be embedded nulls.

Class Json::Writer
Use StreamWriter. (And really, this is an implementation detail.)

Chapter 3

Todo List

Namespace WIP

Github

- "Dev-Ops"
- Doxygen settings
- Template-Comment
- Template-Header-Comment

Global WIP::exampleEasyLogging ()

Configure easylogging properly

- outsource easylogging config
  - e.g. startup class?

Chapter 4

Namespace Index

4.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 5

Hierarchical Index

5.1 Class Hierarchy

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

Chapter 6

Data Structure Index

6.1 Data Structures

Here are the data structures with brief descriptions:

Chapter 7

File Index

7.1 File List

Here is a list of all files with brief descriptions:

Chapter 8

Namespace Documentation

8.1 el Namespace Reference

Easylogging++ entry namespace.

Namespaces

- namespace base

  Namespace containing base/internal functionality used by Easylogging++.

Data Structures

- class Callback
- class Configuration

  Represents single configuration that has representing level, configuration type and a string based value.
- class Configurations

  Thread-safe Configuration repository.
- struct ConfigurationStringToTypeItem
- class ConfigurationTypeHelper

  Static class that contains helper functions for el::ConfigurationType.
- class CustomFormatSpecifier

  User-provided custom format specifier.
- class Helpers

  Static helpers for developers.
- class LevelHelper

  Static class that contains helper functions for el::Level.
- class LogBuilder
- class LogDispatchCallback
- class LogDispatchData
- class Loggable

  Base of Easylogging++ friendly class.
- class Logger

  Represents a logger holding ID and configurations we need to write logs.
- class LoggerRegistrationCallback
- class Loggers

Static helpers to deal with loggers and their configurations.

- class LogMessage
- class PerformanceTrackingCallback
- struct StringToLevelItem
- class SysLogInitializer

  Initializes syslog with process ID, options and facility. calls closelog() on d'tor.
- class VersionInfo

Typedefs

- typedef std::function< void(const char *, std::size_t)> PreRollOutCallback
- typedef std::function< std::string(const LogMessage *)> FormatSpecifierValueResolver

  Resolving function for format specifier.
- typedef std::shared_ptr< LogBuilder > LogBuilderPtr

Enumerations

- enum class Level : base::type::EnumType {
  Global = 1 , Trace = 2 , Debug = 4 , Fatal = 8 ,
  Error = 16 , Warning = 32 , Verbose = 64 , Info = 128 ,
  Unknown = 1010 }

  Represents enumeration for severity level used to determine level of logging.
- enum class ConfigurationType : base::type::EnumType {
  Enabled = 1 , ToFile = 2 , ToStandardOutput = 4 , Format = 8 ,
  Filename = 16 , SubsecondPrecision = 32 , MillisecondsWidth = SubsecondPrecision , PerformanceTracking = 64 ,
  MaxLogFileSize = 128 , LogFlushThreshold = 256 , Unknown = 1010 }

  Represents enumeration of ConfigurationType used to configure or access certain aspect of logging.
- enum class LoggingFlag : base::type::EnumType {
  NewLineForContainer = 1 , AllowVerboseIfModuleNotSpecified = 2 , LogDetailedCrashReason = 4 , DisableApplicationAbortOnFatalLog = 8 ,
  ImmediateFlush = 16 , StrictLogFileSizeCheck = 32 , ColoredTerminalOutput = 64 , MultiLoggerSupport = 128 ,
  DisablePerformanceTrackingCheckpointComparison = 256 , DisableVModules = 512 , DisableVModulesExtensions = 1024 , HierarchicalLogging = 2048 ,
  CreateLoggerAutomatically = 4096 , AutoSpacing = 8192 , FixedTimeFormat = 16384 , IgnoreSigInt = 32768
  }

  Flags used while writing logs. This flags are set by user.

Variables

- base::debug::CrashHandler elCrashHandler
- static struct StringToLevelItem stringToLevelMap [ ]
- static struct ConfigurationStringToTypeItem configStringToTypeMap [ ]

8.1.1 Detailed Description

Easylogging++ entry namespace.

8.1.2 Typedef Documentation

8.1.2.1 FormatSpecifierValueResolver

```
typedef std::function<std::string(const LogMessage*)> el::FormatSpecifierValueResolver
```

Resolving function for format specifier.

Definition at line 1642 of file easylogging++.h.

8.1.2.2 LogBuilderPtr

```
typedef std::shared_ptr<LogBuilder> el::LogBuilderPtr
```

Definition at line 2209 of file easylogging++.h.

8.1.2.3 PreRollOutCallback

```
typedef std::function<void(const char*, std::size_t)> el::PreRollOutCallback
```

Definition at line 808 of file easylogging++.h.

8.1.3 Enumeration Type Documentation

8.1.3.1 ConfigurationType

```
enum class el::ConfigurationType : base::type::EnumType [strong]
```

Represents enumeration of ConfigurationType used to configure or access certain aspect of logging.

Enumerator

Enabled	Determines whether or not corresponding level and logger of logging is enabled You may disable all logs by using el::Level::Global.
ToFile	Whether or not to write corresponding log to log file.
ToStandardOutput	Whether or not to write corresponding level and logger log to standard output. By standard output meaning termnal, command prompt etc.
Format	Determines format of logging corresponding level and logger.
Filename	Determines log file (full path) to write logs to for corresponding level and logger.
SubsecondPrecision	Specifies precision of the subsecond part. It should be within range (1-6).
MillisecondsWidth	Alias of SubsecondPrecision (for backward compatibility)
PerformanceTracking	Determines whether or not performance tracking is enabled. @detail This does not depend on logger or level. Performance tracking always uses 'performance' logger
MaxLogFileSize	Specifies log file max size. @detail If file size of corresponding log file (for corresponding level) is >= specified size, log file will be truncated and re-initiated.
LogFlushThreshold	Specifies number of log entries to hold until we flush pending log data.
Unknown	Represents unknown configuration.

Definition at line 633 of file easylogging++.h.

8.1.3.2 Level

```
enum class el::Level : base::type::EnumType [strong]
```

Represents enumeration for severity level used to determine level of logging.

@detail With Easylogging++, developers may disable or enable any level regardless of what the severity is. Or they can choose to log using hierarchical logging flag

Enumerator

Global	Generic level that represents all the levels. Useful when setting global configuration for all levels.
Trace	Information that can be useful to back-trace certain events - mostly useful than debug logs.
Debug	Informational events most useful for developers to debug application.
Fatal	Severe error information that will presumably abort application.
Error	Information representing errors in application but application will keep running.
Warning	Useful when application has potentially harmful situations.
Verbose	Information that can be highly useful and vary with verbose logging level.
Info	Mainly useful to represent current progress of application.
Unknown	Represents unknown level.

Definition at line 573 of file easylogging++.h.

8.1.3.3 LoggingFlag

```
enum class el::LoggingFlag : base::type::EnumType [strong]
```

Flags used while writing logs. This flags are set by user.

Enumerator

NewLineForContainer	Makes sure we have new line for each container log entry.
AllowVerboseIfModuleNotSpecified	Makes sure if -vmodule is used and does not specifies a module, then verbose logging is allowed via that module.
LogDetailedCrashReason	When handling crashes by default, detailed crash reason will be logged as well.
DisableApplicationAbortOnFatalLog	Allows to disable application abortion when logged using FATAL level.
ImmediateFlush	Flushes log with every log-entry (performance sensitive) - Disabled by default.
StrictLogFileSizeCheck	Enables strict file rolling.
ColoredTerminalOutput	Make terminal output colorful for supported terminals.
MultiLoggerSupport	Supports use of multiple logging in same macro, e.g, CLOG(INFO, "default", "network")
DisablePerformanceTrackingCheckpointComparison	Disables comparing performance tracker's checkpoints.

Enumerator

DisableVModules	Disable VModules.
DisableVModulesExtensions	Disable VModules extensions.
HierarchicalLogging	Enables hierarchical logging.
CreateLoggerAutomatically	Creates logger automatically when not available.
AutoSpacing	Adds spaces b/w logs that separated by left-shift operator.
FixedTimeFormat	Preserves time format and does not convert it to sec, hour etc (performance tracking only)
IgnoreSigInt	

Definition at line 694 of file easylogging++.h.

8.1.4 Variable Documentation

8.1.4.1 configStringToTypeMap

```
struct ConfigurationStringToTypeItem el::configStringToTypeMap[]  [static]
```

Initial value:

```
= {
  { "enabled", ConfigurationType::Enabled },
  { "to_file", ConfigurationType::ToFile },
  { "to_standard_output", ConfigurationType::ToStandardOutput },
  { "format", ConfigurationType::Format },
  { "filename", ConfigurationType::Filename },
  { "subsecond_precision", ConfigurationType::SubsecondPrecision },
  { "milliseconds_width", ConfigurationType::MillisecondsWidth },
  { "performance_tracking", ConfigurationType::PerformanceTracking },
  { "max_log_file_size", ConfigurationType::MaxLogFileSize },
  { "log_flush_threshold", ConfigurationType::LogFlushThreshold },
}
```

Definition at line 201 of file easylogging++.cc.

8.1.4.2 elCrashHandler

```
base::debug::CrashHandler el::elCrashHandler  [extern]
```

8.1.4.3 stringToLevelMap

```
struct StringToLevelItem el::stringToLevelMap[]  [static]
```

Initial value:

```
= {
  { "global", Level::Global },
  { "debug", Level::Debug },
  { "info", Level::Info },
  { "warning", Level::Warning },
  { "error", Level::Error },
  { "fatal", Level::Fatal },
  { "verbose", Level::Verbose },
  { "trace", Level::Trace }
}
```

Definition at line 150 of file easylogging++.cc.

8.2 el::base Namespace Reference

Namespace containing base/internal functionality used by Easylogging++.

Namespaces

- namespace consts

  Namespace containing constants used internally.
- namespace debug

  Contains some internal debugging tools like crash handler and stack tracer.
- namespace threading
- namespace type

  Data types used by Easylogging++.
- namespace utils

  Namespace containing utility functions/static classes used internally.

Data Structures

- class DefaultLogBuilder
- class DefaultLogDispatchCallback
- class HitCounter

  Class that keeps record of current line hit for occasional logging.
- class LogDispatcher

  Dispatches log messages.
- class LogFormat

  Represents log format containing flags and date format. This is used internally to start initial log.
- class MessageBuilder
- class NoCopy

  Internal helper class that prevent copy constructor for class.
- class NullWriter

  Writes nothing - Used when certain log is disabled.
- class PErrorWriter
- class RegisteredHitCounters

  Repository for hit counters used across the application.
- class RegisteredLoggers

  Loggers repository.
- class StaticClass

  Internal helper class that makes all default constructors private.
- class Storage

  Easylogging++ management storage.
- class SubsecondPrecision

  A subsecond precision class containing actual width and offset of the subsecond part.
- class TypedConfigurations

  Configurations with data types.
- class VRegistry

  Represents registries for verbose logging.
- class Writer

  Main entry point of each logging.

Typedefs

- typedef SubsecondPrecision MillisecondsWidth

  Type alias of SubsecondPrecision.
- typedef std::shared_ptr< base::type::fstream_t > FileStreamPtr
- typedef std::unordered_map< std::string, FileStreamPtr > LogStreamsReferenceMap
- typedef std::shared_ptr< base::LogStreamsReferenceMap > LogStreamsReferenceMapPtr

Enumerations

- enum class TimestampUnit : base::type::EnumType {
  Microsecond = 0 , Millisecond = 1 , Second = 2 , Minute = 3 ,
  Hour = 4 , Day = 5 }

  Enum to represent timestamp unit.
- enum class FormatFlags : base::type::EnumType {
  DateTime = 1 << 1 , LoggerId = 1 << 2 , File = 1 << 3 , Line = 1 << 4 ,
  Location = 1 << 5 , Function = 1 << 6 , User = 1 << 7 , Host = 1 << 8 ,
  LogMessage = 1 << 9 , VerboseLevel = 1 << 10 , AppName = 1 << 11 , ThreadId = 1 << 12 ,
  Level = 1 << 13 , FileBase = 1 << 14 , LevelShort = 1 << 15 }

  Format flags used to determine specifiers that are active for performance improvements.
- enum class DispatchAction : base::type::EnumType { None = 1 , NormalLog = 2 , SysLog = 4 }

  Action to be taken for dispatching.

Functions

- static void defaultPreRollOutCallback (const char *, std::size_t)

Variables

- ELPP_EXPORT base::type::StoragePointer elStorage

8.2.1 Detailed Description

Namespace containing base/internal functionality used by Easylogging++.

8.2.2 Typedef Documentation

8.2.2.1 FileStreamPtr

```
typedef std::shared_ptr<base::type::fstream_t> el::base::FileStreamPtr  [private]
```

Definition at line 1895 of file easylogging++.h.

8.2.2.2 LogStreamsReferenceMap

```
typedef std::unordered_map<std::string, FileStreamPtr> el::base::LogStreamsReferenceMap  [private]
```

Definition at line 1896 of file easylogging++.h.

8.2.2.3 LogStreamsReferenceMapPtr

```
typedef std::shared_ptr<base::LogStreamsReferenceMap> el::base::LogStreamsReferenceMapPtr
[private]
```

Definition at line 1897 of file easylogging++.h.

8.2.2.4 MillisecondsWidth

```
typedef SubsecondPrecision el::base::MillisecondsWidth
```

Type alias of SubsecondPrecision.

Definition at line 851 of file easylogging++.h.

8.2.3 Enumeration Type Documentation

8.2.3.1 DispatchAction

```
enum class el::base::DispatchAction :  base::type::EnumType  [strong], [private]
```

Action to be taken for dispatching.

Enumerator

None	
NormalLog	
SysLog	

Definition at line 2139 of file easylogging++.h.

8.2.3.2 FormatFlags

```
enum class el::base::FormatFlags :  base::type::EnumType  [strong]
```

Format flags used to determine specifiers that are active for performance improvements.

Enumerator

DateTime	
LoggerId	
File	
Line	
Location	
Function	
User	
Host	
LogMessage	

Enumerator

VerboseLevel	
AppName	
ThreadId	
Level	
FileBase	
LevelShort	

Definition at line 816 of file easylogging++.h.

8.2.3.3 TimestampUnit

```
enum class el::base::TimestampUnit :  base::type::EnumType  [strong]
```

Enum to represent timestamp unit.

Enumerator

Microsecond	
Millisecond	
Second	
Minute	
Hour	
Day	

Definition at line 812 of file easylogging++.h.

8.2.4 Function Documentation

8.2.4.1 defaultPreRollOutCallback()

```
static void el::base::defaultPreRollOutCallback (
             const char * ,
             std::size_t  )  [inline], [static]
```

Definition at line 810 of file easylogging++.h.

8.2.5 Variable Documentation

8.2.5.1 elStorage

```
ELPP_EXPORT base::type::StoragePointer el::base::elStorage  [extern], [private]
```

8.3 el::base::consts Namespace Reference

Namespace containing constants used internally.

Variables

- static const char kFormatSpecifierCharValue = 'v'
- static const char kFormatSpecifierChar = '%'
- static const unsigned int kMaxLogPerCounter = 100000
- static const unsigned int kMaxLogPerContainer = 100
- static const unsigned int kDefaultSubsecondPrecision = 3
- static const char * kDefaultLoggerId = "default"
- static const char * kFilePathSeparator = "/"
- static const std::size_t kSourceFilenameMaxLength = 100
- static const std::size_t kSourceLineMaxLength = 10
- static const Level kPerformanceTrackerDefaultLevel = Level::Info
- struct {
  double el::base::consts::value
  const base::type::char_t * el::base::consts::unit
  } kTimeFormats [ ]

- static const int kTimeFormatsCount = sizeof(kTimeFormats) / sizeof(kTimeFormats[0])
- struct {
  int el::base::consts::numb
  const char * el::base::consts::name
  const char * el::base::consts::brief
  const char * el::base::consts::detail
  } kCrashSignals [ ]

- static const int kCrashSignalsCount = sizeof(kCrashSignals) / sizeof(kCrashSignals[0])
- static const base::type::char_t * kInfoLevelLogValue = ELPP_LITERAL("INFO")
- static const base::type::char_t * kDebugLevelLogValue = ELPP_LITERAL("DEBUG")
- static const base::type::char_t * kWarningLevelLogValue = ELPP_LITERAL("WARNING")
- static const base::type::char_t * kErrorLevelLogValue = ELPP_LITERAL("ERROR")
- static const base::type::char_t * kFatalLevelLogValue = ELPP_LITERAL("FATAL")
- static const base::type::char_t * kVerboseLevelLogValue
- static const base::type::char_t * kTraceLevelLogValue = ELPP_LITERAL("TRACE")
- static const base::type::char_t * kInfoLevelShortLogValue = ELPP_LITERAL("I")
- static const base::type::char_t * kDebugLevelShortLogValue = ELPP_LITERAL("D")
- static const base::type::char_t * kWarningLevelShortLogValue = ELPP_LITERAL("W")
- static const base::type::char_t * kErrorLevelShortLogValue = ELPP_LITERAL("E")
- static const base::type::char_t * kFatalLevelShortLogValue = ELPP_LITERAL("F")
- static const base::type::char_t * kVerboseLevelShortLogValue = ELPP_LITERAL("V")
- static const base::type::char_t * kTraceLevelShortLogValue = ELPP_LITERAL("T")
- static const base::type::char_t * kAppNameFormatSpecifier = ELPP_LITERAL("%app")
- static const base::type::char_t * kLoggerIdFormatSpecifier = ELPP_LITERAL("%logger")
- static const base::type::char_t * kThreadIdFormatSpecifier = ELPP_LITERAL("%thread")
- static const base::type::char_t * kSeverityLevelFormatSpecifier = ELPP_LITERAL("%level")
- static const base::type::char_t * kSeverityLevelShortFormatSpecifier = ELPP_LITERAL("%levshort")
- static const base::type::char_t * kDateTimeFormatSpecifier = ELPP_LITERAL("%datetime")
- static const base::type::char_t * kLogFileFormatSpecifier = ELPP_LITERAL("%file")
- static const base::type::char_t * kLogFileBaseFormatSpecifier = ELPP_LITERAL("%fbase")
- static const base::type::char_t * kLogLineFormatSpecifier = ELPP_LITERAL("%line")
- static const base::type::char_t * kLogLocationFormatSpecifier = ELPP_LITERAL("%loc")
- static const base::type::char_t * kLogFunctionFormatSpecifier = ELPP_LITERAL("%func")
- static const base::type::char_t * kCurrentUserFormatSpecifier = ELPP_LITERAL("%user")
- static const base::type::char_t * kCurrentHostFormatSpecifier = ELPP_LITERAL("%host")
- static const base::type::char_t * kMessageFormatSpecifier = ELPP_LITERAL("%msg")
- static const base::type::char_t * kVerboseLevelFormatSpecifier = ELPP_LITERAL("%vlevel")

- static const char * kDateTimeFormatSpecifierForFilename = "%datetime"
- static const char * kDays [7] = { "Sunday", "Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday" }
- static const char * kDaysAbbrev [7] = { "Sun", "Mon", "Tue", "Wed", "Thu", "Fri", "Sat" }
- static const char * kMonths [12]
- static const char * kMonthsAbbrev [12] = { "Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep", "Oct", "Nov", "Dec" }
- static const char * kDefaultDateTimeFormat = "%Y-%M-%d %H:%m:%s,%g"
- static const char * kDefaultDateTimeFormatInFilename = "%Y-%M-%d_%H-%m"
- static const int kYearBase = 1900
- static const char * kAm = "AM"
- static const char * kPm = "PM"
- static const char * kNullPointer = "nullptr"
- static const base::type::VerboseLevel kMaxVerboseLevel = 9
- static const char * kUnknownUser = "unknown-user"
- static const char * kUnknownHost = "unknown-host"
- static const char * kDefaultLogFile = "myeasylog.log"
- static const char * kDefaultLogFileParam = "--default-log-file"
- static const char * kValidLoggerIdSymbols
- static const char * kConfigurationComment = "##"
- static const char * kConfigurationLevel = "*"
- static const char * kConfigurationLoggerId = "--"

8.3.1 Detailed Description

Namespace containing constants used internally.

8.3.2 Variable Documentation

8.3.2.1 brief

```
const char* el::base::consts::brief
```

Definition at line 780 of file easylogging++.h.

8.3.2.2 detail

```
const char* el::base::consts::detail
```

Definition at line 781 of file easylogging++.h.

8.3.2.3 kAm

```
const char* el::base::consts::kAm = "AM"  [static]
```

Definition at line 70 of file easylogging++.cc.

8.3.2.4 kAppNameFormatSpecifier

```
const base::type::char_t* el::base::consts::kAppNameFormatSpecifier = ELPP_LITERAL("%app")
[static]
```

Definition at line 44 of file easylogging++.cc.

8.3.2.5 kConfigurationComment

```
const char* el::base::consts::kConfigurationComment = "##"  [static]
```

Definition at line 105 of file easylogging++.cc.

8.3.2.6 kConfigurationLevel

```
const char* el::base::consts::kConfigurationLevel = "*"  [static]
```

Definition at line 106 of file easylogging++.cc.

8.3.2.7 kConfigurationLoggerId

```
const char* el::base::consts::kConfigurationLoggerId = "--"  [static]
```

Definition at line 107 of file easylogging++.cc.

8.3.2.8 [struct]

```
const struct { ...  } el::base::consts::kCrashSignals[]
```

Initial value:

```
= {

  {
    SIGABRT, "SIGABRT", "Abnormal termination",
    "Program was abnormally terminated."
  },
  {
    SIGFPE, "SIGFPE", "Erroneous arithmetic operation",
    "Arithmetic operation issue such as division by zero or operation resulting in overflow."
  },
  {
    SIGILL, "SIGILL", "Illegal instruction",
    "Generally due to a corruption in the code or to an attempt to execute data."
  },
  {
    SIGSEGV, "SIGSEGV", "Invalid access to memory",
    "Program is trying to read an invalid (unallocated, deleted or corrupted) or inaccessible memory."
  },
  {
    SIGINT, "SIGINT", "Interactive attention signal",
    "Interruption generated (generally) by user or operating system."
  },
}
```

8.3.2.9 kCrashSignalsCount

```
const int el::base::consts::kCrashSignalsCount = sizeof(kCrashSignals) / sizeof(kCrashSignals[0])
[static]
```

Definition at line 805 of file easylogging++.h.

8.3.2.10 kCurrentHostFormatSpecifier

```
const base::type::char_t* el::base::consts::kCurrentHostFormatSpecifier = ELPP_LITERAL("%host")
[static]
```

Definition at line 56 of file easylogging++.cc.

8.3.2.11 kCurrentUserFormatSpecifier

```
const base::type::char_t* el::base::consts::kCurrentUserFormatSpecifier = ELPP_LITERAL("%user")
[static]
```

Definition at line 55 of file easylogging++.cc.

8.3.2.12 kDateTimeFormatSpecifier

```
const base::type::char_t* el::base::consts::kDateTimeFormatSpecifier = ELPP_LITERAL("%datetime")
[static]
```

Definition at line 49 of file easylogging++.cc.

8.3.2.13 kDateTimeFormatSpecifierForFilename

```
const char* el::base::consts::kDateTimeFormatSpecifierForFilename = "%datetime"  [static]
```

Definition at line 59 of file easylogging++.cc.

8.3.2.14 kDays

```
const char* el::base::consts::kDays[7] = { "Sunday", "Monday", "Tuesday", "Wednesday", "Thursday",
"Friday", "Saturday" }  [static]
```

Definition at line 61 of file easylogging++.cc.

8.3.2.15 kDaysAbbrev

```
const char* el::base::consts::kDaysAbbrev[7] = { "Sun", "Mon", "Tue", "Wed", "Thu", "Fri",
"Sat" }  [static]
```

Definition at line 62 of file easylogging++.cc.

8.3.2.16 kDebugLevelLogValue

```
const base::type::char_t* el::base::consts::kDebugLevelLogValue = ELPP_LITERAL("DEBUG")  [static]
```

Definition at line 29 of file easylogging++.cc.

8.3.2.17 kDebugLevelShortLogValue

```
const base::type::char_t* el::base::consts::kDebugLevelShortLogValue = ELPP_LITERAL("D")  [static]
```

Definition at line 37 of file easylogging++.cc.

8.3.2.18 kDefaultDateTimeFormat

```
const char* el::base::consts::kDefaultDateTimeFormat = "%Y-%M-%d %H:%m:%s,%g"  [static]
```

Definition at line 67 of file easylogging++.cc.

8.3.2.19 kDefaultDateTimeFormatInFilename

```
const char* el::base::consts::kDefaultDateTimeFormatInFilename = "%Y-%M-%d_%H-%m"  [static]
```

Definition at line 68 of file easylogging++.cc.

8.3.2.20 kDefaultLogFile

```
const char* el::base::consts::kDefaultLogFile = "myeasylog.log"  [static]
```

Definition at line 93 of file easylogging++.cc.

8.3.2.21 kDefaultLogFileParam

```
const char* el::base::consts::kDefaultLogFileParam = "--default-log-file"  [static]
```

Definition at line 98 of file easylogging++.cc.

8.3.2.22 kDefaultLoggerId

```
const char* el::base::consts::kDefaultLoggerId = "default"  [static]
```

Definition at line 741 of file easylogging++.h.

8.3.2.23 kDefaultSubsecondPrecision

```
const unsigned int el::base::consts::kDefaultSubsecondPrecision = 3  [static]
```

Definition at line 736 of file easylogging++.h.

8.3.2.24 kErrorLevelLogValue

```
const base::type::char_t* el::base::consts::kErrorLevelLogValue = ELPP_LITERAL("ERROR")  [static]
```

Definition at line 31 of file easylogging++.cc.

8.3.2.25 kErrorLevelShortLogValue

```
const base::type::char_t* el::base::consts::kErrorLevelShortLogValue = ELPP_LITERAL("E")  [static]
```

Definition at line 39 of file easylogging++.cc.

8.3.2.26 kFatalLevelLogValue

```
const base::type::char_t* el::base::consts::kFatalLevelLogValue = ELPP_LITERAL("FATAL")  [static]
```

Definition at line 32 of file easylogging++.cc.

8.3.2.27 kFatalLevelShortLogValue

```
const base::type::char_t* el::base::consts::kFatalLevelShortLogValue = ELPP_LITERAL("F")  [static]
```

Definition at line 40 of file easylogging++.cc.

8.3.2.28 kFilePathSeparator

```
const char* el::base::consts::kFilePathSeparator = "/"  [static]
```

Definition at line 759 of file easylogging++.h.

8.3.2.29 kFormatSpecifierChar

```
const char el::base::consts::kFormatSpecifierChar = '%'  [static]
```

Definition at line 733 of file easylogging++.h.

8.3.2.30 kFormatSpecifierCharValue

```
const char el::base::consts::kFormatSpecifierCharValue = 'v'  [static]
```

Definition at line 732 of file easylogging++.h.

8.3.2.31 kInfoLevelLogValue

```
const base::type::char_t* el::base::consts::kInfoLevelLogValue = ELPP_LITERAL("INFO")  [static]
```

Definition at line 28 of file easylogging++.cc.

8.3.2.32 kInfoLevelShortLogValue

```
const base::type::char_t* el::base::consts::kInfoLevelShortLogValue = ELPP_LITERAL("I")  [static]
```

Definition at line 36 of file easylogging++.cc.

8.3.2.33 kLogFileBaseFormatSpecifier

```
const base::type::char_t* el::base::consts::kLogFileBaseFormatSpecifier = ELPP_LITERAL("%fbase")
[static]
```

Definition at line 51 of file easylogging++.cc.

8.3.2.34 kLogFileFormatSpecifier

```
const base::type::char_t* el::base::consts::kLogFileFormatSpecifier = ELPP_LITERAL("%file")
[static]
```

Definition at line 50 of file easylogging++.cc.

8.3.2.35 kLogFunctionFormatSpecifier

```
const base::type::char_t* el::base::consts::kLogFunctionFormatSpecifier = ELPP_LITERAL("%func")
[static]
```

Definition at line 54 of file easylogging++.cc.

8.3.2.36 kLoggerIdFormatSpecifier

```
const base::type::char_t* el::base::consts::kLoggerIdFormatSpecifier = ELPP_LITERAL("%logger")
[static]
```

Definition at line 45 of file easylogging++.cc.

8.3.2.37 kLogLineFormatSpecifier

```
const base::type::char_t* el::base::consts::kLogLineFormatSpecifier = ELPP_LITERAL("%line")
[static]
```

Definition at line 52 of file easylogging++.cc.

8.3.2.38 kLogLocationFormatSpecifier

```
const base::type::char_t* el::base::consts::kLogLocationFormatSpecifier = ELPP_LITERAL("%loc")
[static]
```

Definition at line 53 of file easylogging++.cc.

8.3.2.39 kMaxLogPerContainer

```
const unsigned int el::base::consts::kMaxLogPerContainer = 100  [static]
```

Definition at line 735 of file easylogging++.h.

8.3.2.40 kMaxLogPerCounter

```
const unsigned int el::base::consts::kMaxLogPerCounter = 100000  [static]
```

Definition at line 734 of file easylogging++.h.

8.3.2.41 kMaxVerboseLevel

```
const base::type::VerboseLevel el::base::consts::kMaxVerboseLevel = 9  [static]
```

Definition at line 77 of file easylogging++.cc.

8.3.2.42 kMessageFormatSpecifier

```
const base::type::char_t* el::base::consts::kMessageFormatSpecifier = ELPP_LITERAL("%msg")
[static]
```

Definition at line 57 of file easylogging++.cc.

8.3.2.43 kMonths

```
const char* el::base::consts::kMonths[12]  [static]
```

Initial value:

```
=      { "January", "February", "March", "April", "May", "June", "July", "August",
                                                    "September", "October", "November", "December"
                                                  }
```

Definition at line 63 of file easylogging++.cc.

8.3.2.44 kMonthsAbbrev

```
const char* el::base::consts::kMonthsAbbrev[12] = { "Jan", "Feb", "Mar", "Apr", "May", "Jun",
"Jul", "Aug", "Sep", "Oct", "Nov", "Dec" }  [static]
```

Definition at line 66 of file easylogging++.cc.

8.3.2.45 kNullPointer

```
const char* el::base::consts::kNullPointer = "nullptr"  [static]
```

Definition at line 74 of file easylogging++.cc.

8.3.2.46 kPerformanceTrackerDefaultLevel

```
const Level el::base::consts::kPerformanceTrackerDefaultLevel = Level::Info  [static]
```

Definition at line 764 of file easylogging++.h.

8.3.2.47 kPm

```
const char* el::base::consts::kPm = "PM"  [static]
```

Definition at line 71 of file easylogging++.cc.

8.3.2.48 kSeverityLevelFormatSpecifier

```
const base::type::char_t* el::base::consts::kSeverityLevelFormatSpecifier = ELPP_LITERAL("%level")
[static]
```

Definition at line 47 of file easylogging++.cc.

8.3.2.49 kSeverityLevelShortFormatSpecifier

```
const base::type::char_t* el::base::consts::kSeverityLevelShortFormatSpecifier = ELPP_LITERAL("%levshort")
[static]
```

Definition at line 48 of file easylogging++.cc.

8.3.2.50 kSourceFilenameMaxLength

```
const std::size_t el::base::consts::kSourceFilenameMaxLength = 100  [static]
```

Definition at line 762 of file easylogging++.h.

8.3.2.51 kSourceLineMaxLength

```
const std::size_t el::base::consts::kSourceLineMaxLength = 10  [static]
```

Definition at line 763 of file easylogging++.h.

8.3.2.52 kThreadIdFormatSpecifier

```
const base::type::char_t* el::base::consts::kThreadIdFormatSpecifier = ELPP_LITERAL("%thread")
[static]
```

Definition at line 46 of file easylogging++.cc.

8.3.2.53 [struct]

```
const struct { ...  } el::base::consts::kTimeFormats[]
```

Initial value:

```
= {
  { 1000.0f, ELPP_LITERAL("us") },
  { 1000.0f, ELPP_LITERAL("ms") },
  { 60.0f, ELPP_LITERAL("seconds") },
  { 60.0f, ELPP_LITERAL("minutes") },
  { 24.0f, ELPP_LITERAL("hours") },
  { 7.0f, ELPP_LITERAL("days") }
}
```

8.3.2.54 kTimeFormatsCount

```
const int el::base::consts::kTimeFormatsCount = sizeof(kTimeFormats) / sizeof(kTimeFormats[0])
[static]
```

Definition at line 776 of file easylogging++.h.

8.3.2.55 kTraceLevelLogValue

```
const base::type::char_t* el::base::consts::kTraceLevelLogValue = ELPP_LITERAL("TRACE")  [static]
```

Definition at line 35 of file easylogging++.cc.

8.3.2.56 kTraceLevelShortLogValue

```
const base::type::char_t* el::base::consts::kTraceLevelShortLogValue = ELPP_LITERAL("T")  [static]
```

Definition at line 42 of file easylogging++.cc.

8.3.2.57 kUnknownHost

```
const char* el::base::consts::kUnknownHost = "unknown-host"  [static]
```

Definition at line 79 of file easylogging++.cc.

8.3.2.58 kUnknownUser

```
const char* el::base::consts::kUnknownUser = "unknown-user"  [static]
```

Definition at line 78 of file easylogging++.cc.

8.3.2.59 kValidLoggerIdSymbols

```
const char* el::base::consts::kValidLoggerIdSymbols  [static]
```

Initial value:

```
=
  "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789-._"
```

Definition at line 103 of file easylogging++.cc.

8.3.2.60 kVerboseLevelFormatSpecifier

```
const base::type::char_t* el::base::consts::kVerboseLevelFormatSpecifier = ELPP_LITERAL("%vlevel")
[static]
```

Definition at line 58 of file easylogging++.cc.

8.3.2.61 kVerboseLevelLogValue

```
const base::type::char_t* el::base::consts::kVerboseLevelLogValue  [static]
```

Initial value:

```
=
  ELPP_LITERAL("VERBOSE")
```

Definition at line 33 of file easylogging++.cc.

8.3.2.62 kVerboseLevelShortLogValue

```
const base::type::char_t* el::base::consts::kVerboseLevelShortLogValue = ELPP_LITERAL("V")
[static]
```

Definition at line 41 of file easylogging++.cc.

8.3.2.63 kWarningLevelLogValue

```
const base::type::char_t* el::base::consts::kWarningLevelLogValue = ELPP_LITERAL("WARNING")
[static]
```

Definition at line 30 of file easylogging++.cc.

8.3.2.64 kWarningLevelShortLogValue

```
const base::type::char_t* el::base::consts::kWarningLevelShortLogValue = ELPP_LITERAL("W")
[static]
```

Definition at line 38 of file easylogging++.cc.

8.3.2.65 kYearBase

```
const int el::base::consts::kYearBase = 1900  [static]
```

Definition at line 69 of file easylogging++.cc.

8.3.2.66 name

```
const char* el::base::consts::name
```

Definition at line 779 of file easylogging++.h.

8.3.2.67 numb

```
int el::base::consts::numb
```

Definition at line 778 of file easylogging++.h.

8.3.2.68 unit

```
const base::type::char_t* el::base::consts::unit
```

Definition at line 767 of file easylogging++.h.

8.3.2.69 value

```
double el::base::consts::value
```

Definition at line 766 of file easylogging++.h.

8.4 el::base::debug Namespace Reference

Contains some internal debugging tools like crash handler and stack tracer.

Data Structures

- class CrashHandler

8.4.1 Detailed Description

Contains some internal debugging tools like crash handler and stack tracer.

8.5 el::base::threading Namespace Reference

Namespaces

- namespace internal

Data Structures

- class ThreadSafe

  Base of thread safe class, this class is inheritable-only.

Typedefs

- typedef base::threading::internal::NoMutex Mutex
- typedef base::threading::internal::NoScopedLock< base::threading::Mutex > ScopedLock

Functions

- static std::string getCurrentThreadId (void)

8.5.1 Typedef Documentation

8.5.1.1 Mutex

```
typedef base::threading::internal::NoMutex el::base::threading::Mutex  [private]
```

Definition at line 998 of file easylogging++.h.

8.5.1.2 ScopedLock

```
typedef base::threading::internal::NoScopedLock<base::threading::Mutex> el::base::threading::ScopedLock
[private]
```

Definition at line 999 of file easylogging++.h.

8.5.2 Function Documentation

8.5.2.1 getCurrentThreadId()

```
static std::string el::base::threading::getCurrentThreadId (
            void  )  [inline], [static], [private]
```

Definition at line 1033 of file easylogging++.h.

References getCurrentThreadId().

8.6 el::base::threading::internal Namespace Reference

Data Structures

- class NoMutex

  Mutex wrapper used when multi-threading is disabled.
- class NoScopedLock

  Lock guard wrapper used when multi-threading is disabled.

8.7 el::base::type Namespace Reference

Data types used by Easylogging++.

Typedefs

- typedef char char_t
- typedef std::string string_t
- typedef std::stringstream stringstream_t
- typedef std::fstream fstream_t
- typedef std::ostream ostream_t
- typedef unsigned int EnumType
- typedef unsigned short VerboseLevel
- typedef unsigned long int LineNumber
- typedef std::shared_ptr< base::Storage > StoragePointer
- typedef std::shared_ptr< LogDispatchCallback > LogDispatchCallbackPtr
- typedef std::shared_ptr< PerformanceTrackingCallback > PerformanceTrackingCallbackPtr
- typedef std::shared_ptr< LoggerRegistrationCallback > LoggerRegistrationCallbackPtr
- typedef std::unique_ptr< el::base::PerformanceTracker > PerformanceTrackerPtr

8.7.1 Detailed Description

Data types used by Easylogging++.

8.7.2 Typedef Documentation

8.7.2.1 char_t

```
typedef char el::base::type::char_t
```

Definition at line 528 of file easylogging++.h.

8.7.2.2 EnumType

```
typedef unsigned int el::base::type::EnumType
```

Definition at line 539 of file easylogging++.h.

8.7.2.3 fstream_t

```
typedef std::fstream el::base::type::fstream_t
```

Definition at line 531 of file easylogging++.h.

8.7.2.4 LineNumber

```
typedef unsigned long int el::base::type::LineNumber
```

Definition at line 541 of file easylogging++.h.

8.7.2.5 LogDispatchCallbackPtr

```
typedef std::shared_ptr<LogDispatchCallback> el::base::type::LogDispatchCallbackPtr
```

Definition at line 543 of file easylogging++.h.

8.7.2.6 LoggerRegistrationCallbackPtr

```
typedef std::shared_ptr<LoggerRegistrationCallback> el::base::type::LoggerRegistrationCallbackPtr
```

Definition at line 545 of file easylogging++.h.

8.7.2.7 ostream_t

```
typedef std::ostream el::base::type::ostream_t
```

Definition at line 532 of file easylogging++.h.

8.7.2.8 PerformanceTrackerPtr

```
typedef std::unique_ptr<el::base::PerformanceTracker> el::base::type::PerformanceTrackerPtr
```

Definition at line 546 of file easylogging++.h.

8.7.2.9 PerformanceTrackingCallbackPtr

```
typedef std::shared_ptr<PerformanceTrackingCallback> el::base::type::PerformanceTrackingCallbackPtr
```

Definition at line 544 of file easylogging++.h.

8.7.2.10 StoragePointer

```
typedef std::shared_ptr<base::Storage> el::base::type::StoragePointer
```

Definition at line 542 of file easylogging++.h.

8.7.2.11 string_t

```
typedef std::string el::base::type::string_t
```

Definition at line 529 of file easylogging++.h.

8.7.2.12 stringstream_t

```
typedef std::stringstream el::base::type::stringstream_t
```

Definition at line 530 of file easylogging++.h.

8.7.2.13 VerboseLevel

```
typedef unsigned short el::base::type::VerboseLevel
```

Definition at line 540 of file easylogging++.h.

8.8 el::base::utils Namespace Reference

Namespace containing utility functions/static classes used internally.

Namespaces

- namespace bitwise

  Bitwise operations for C++11 strong enum class. This casts e into Flag_T and returns value after bitwise operation Use these function as.

Data Structures

- class AbstractRegistry

  Abstract registry (aka repository) that provides basic interface for pointer repository specified by T_Ptr type.
- class CommandLineArgs

  Command line arguments for application if specified using el::Helpers::setArgs(..) or START_EASYLOGGINGPP(..)
- class DateTime

  Contains utilities for cross-platform date/time. This class make use of el::base::utils::Str.
- class File
- class OS

  Operating System helper static class used internally. You should not use it.
- class Registry

  A pointer registry mechanism to manage memory and provide search functionalities. (non-predicate version)
- class RegistryWithPred

  A pointer registry mechanism to manage memory and provide search functionalities. (predicate version)
- class Str

  String utilities helper class used internally. You should not use it.
- class Utils

Functions

- template<typename T >
  static std::enable_if< std::is_pointer< T * >::value, void >::type safeDelete (T *&pointer)

  Deletes memory safely and points to null.
- template<typename Enum >
  static void addFlag (Enum e, base::type::EnumType *flag)
- template<typename Enum >
  static void removeFlag (Enum e, base::type::EnumType *flag)
- template<typename Enum >
  static bool hasFlag (Enum e, base::type::EnumType flag)
- static void abort (int status, const std::string &reason)

  Aborts application due with user-defined status.
- base::type::ostream_t & operator<< (base::type::ostream_t &os, const CommandLineArgs &c)

8.8.1 Detailed Description

Namespace containing utility functions/static classes used internally.

8.8.2 Function Documentation

8.8.2.1 abort()

```
static void el::base::utils::abort (
            int status,
            const std::string & reason )  [static]
```

Aborts application due with user-defined status.

Definition at line 113 of file easylogging++.cc.

References abort(), and ELPP_UNUSED.

8.8.2.2 addFlag()

```
template<typename Enum >
static void el::base::utils::addFlag (
            Enum e,
            base::type::EnumType * flag )  [inline], [static], [private]
```

Definition at line 881 of file easylogging++.h.

References el::base::utils::bitwise::Or().

8.8.2.3 hasFlag()

```
template<typename Enum >
static bool el::base::utils::hasFlag (
            Enum e,
            base::type::EnumType flag )  [inline], [static], [private]
```

Definition at line 889 of file easylogging++.h.

References el::base::utils::bitwise::Or().

8.8.2.4 operator<<()

```
base::type::ostream_t & el::base::utils::operator<< (
            base::type::ostream_t & os,
            const CommandLineArgs & c )
```

Definition at line 1368 of file easylogging++.cc.

8.8.2.5 removeFlag()

```
template<typename Enum >
static void el::base::utils::removeFlag (
            Enum e,
            base::type::EnumType * flag )  [inline], [static], [private]
```

Definition at line 885 of file easylogging++.h.

References el::base::utils::bitwise::Or().

8.8.2.6 safeDelete()

```
template<typename T >
static std::enable_if< std::is_pointer< T * >::value, void >::type el::base::utils::safe↩
Delete (
            T *& pointer )  [static], [private]
```

Deletes memory safely and points to null.

Definition at line 858 of file easylogging++.h.

8.9 el::base::utils::bitwise Namespace Reference

Bitwise operations for C++11 strong enum class. This casts e into Flag_T and returns value after bitwise operation Use these function as.

Functions

- template<typename Enum >
  static base::type::EnumType And (Enum e, base::type::EnumType flag)
- template<typename Enum >
  static base::type::EnumType Not (Enum e, base::type::EnumType flag)
- template<typename Enum >
  static base::type::EnumType Or (Enum e, base::type::EnumType flag)

8.9.1 Detailed Description

Bitwise operations for C++11 strong enum class. This casts e into Flag_T and returns value after bitwise operation Use these function as.

```
flag = bitwise::Or<MyEnum>(MyEnum::val1, flag);
```

8.9.2 Function Documentation

8.9.2.1 And()

```
template<typename Enum >
static base::type::EnumType el::base::utils::bitwise::And (
             Enum e,
             base::type::EnumType flag )  [inline], [static], [private]
```

Definition at line 868 of file easylogging++.h.

8.9.2.2 Not()

```
template<typename Enum >
static base::type::EnumType el::base::utils::bitwise::Not (
             Enum e,
             base::type::EnumType flag )  [inline], [static], [private]
```

Definition at line 872 of file easylogging++.h.

8.9.2.3 Or()

```
template<typename Enum >
static base::type::EnumType el::base::utils::bitwise::Or (
             Enum e,
             base::type::EnumType flag )  [inline], [static], [private]
```

Definition at line 876 of file easylogging++.h.

8.10 Json Namespace Reference

JSON (JavaScript Object Notation).

Data Structures

- class CharReader
- class CharReaderBuilder

  Build a CharReader implementation.
- class Exception
- class FastWriter

  Outputs a Value in JSON format without formatting (not human friendly).
- class Features

  Configuration passed to reader and writer. This configuration object can be used to force the Reader or Writer to behave in a standard conforming way.
- class LogicError
- class Path

  Experimental and untested: represents a "path" to access a node.
- class PathArgument

Experimental and untested: represents an element of the "path" to access a node.

- class Reader

  Unserialize a JSON document into a Value.
- class RuntimeError
- class SecureAllocator
- class StaticString

  Lightweight wrapper to tag static string.
- class StreamWriter
- class StreamWriterBuilder

  Build a StreamWriter implementation.
- class StyledStreamWriter

  Writes a Value in JSON format in a human friendly way, to a stream rather than to a string.
- class StyledWriter

  Writes a Value in JSON format in a human friendly way.
- class Value

  Represents a JSON value.
- class ValueConstIterator

  const iterator for object and array value.
- class ValueIterator

  Iterator for object and array value.
- class ValueIteratorBase

  base class for Value iterators.
- class Writer

  Abstract class for writers.

Typedefs

- using Int = int
- using UInt = unsigned int
- using Int64 = int64_t
- using UInt64 = uint64_t
- using LargestInt = Int64
- using LargestUInt = UInt64
- template<typename T >
  using Allocator = typename std::conditional< JSONCPP_USING_SECURE_MEMORY, SecureAllocator< T >, std::allocator< T > >::type
- using String = std::basic_string< char, std::char_traits< char >, Allocator< char > >
- using IStringStream = std::basic_istringstream< String::value_type, String::traits_type, String::allocator_type >
- using OStringStream = std::basic_ostringstream< String::value_type, String::traits_type, String::allocator_type >
- using IStream = std::istream
- using OStream = std::ostream
- using ArrayIndex = unsigned int

Enumerations

- enum ValueType {
  nullValue = 0 , intValue , uintValue , realValue ,
  stringValue , booleanValue , arrayValue , objectValue }

  Type of the value held by a Value object.
- enum CommentPlacement { commentBefore = 0 , commentAfterOnSameLine , commentAfter , numberOfCommentPlacement }
- enum PrecisionType { significantDigits = 0 , decimalPlaces }

  Type of precision for formatting of real values.

Functions

- template<typename T , typename U >
  bool operator== (const SecureAllocator< T > &, const SecureAllocator< U > &)
- template<typename T , typename U >
  bool operator!= (const SecureAllocator< T > &, const SecureAllocator< U > &)
- bool JSON_API parseFromStream (CharReader::Factory const &, IStream &, Value *root, String *errs)
- JSON_API IStream & operator>> (IStream &, Value &)

  Read from 'sin' into 'root'.
- JSONCPP_NORETURN void throwRuntimeError (String const &msg)

  used internally
- JSONCPP_NORETURN void throwLogicError (String const &msg)

  used internally
- void swap (Value &a, Value &b)
- String JSON_API writeString (StreamWriter::Factory const &factory, Value const &root)

  Write into stringstream, then return string, for convenience. A StreamWriter will be created from the factory, used, and then deleted.
- String JSON_API valueToString (Int value)
- String JSON_API valueToString (UInt value)
- String JSON_API valueToString (LargestInt value)
- String JSON_API valueToString (LargestUInt value)
- String JSON_API valueToString (double value, unsigned int precision=Value::defaultRealPrecision, PrecisionType precisionType=PrecisionType::significantDigits)
- String JSON_API valueToString (bool value)
- String JSON_API valueToQuotedString (const char *value)
- JSON_API OStream & operator<< (OStream &, const Value &root)

  Output using the StyledStreamWriter.

8.10.1 Detailed Description

JSON (JavaScript Object Notation).

8.10.2 Typedef Documentation

8.10.2.1 Allocator

```
template<typename T >
using Json::Allocator = typedef typename std::conditional<JSONCPP_USING_SECURE_MEMORY, SecureAllocator<T>,
std::allocator<T> >::type
```

Definition at line 129 of file config.h.

8.10.2.2 ArrayIndex

```
using Json::ArrayIndex = typedef unsigned int
```

Definition at line 32 of file forwards.h.

8.10.2.3 Int

```
using Json::Int = typedef int
```

Definition at line 108 of file config.h.

8.10.2.4 Int64

```
using Json::Int64 = typedef int64_t
```

Definition at line 120 of file config.h.

8.10.2.5 IStream

```
using Json::IStream = typedef std::istream
```

Definition at line 139 of file config.h.

8.10.2.6 IStringStream

```
using Json::IStringStream = typedef std::basic_istringstream<String::value_type, String↩
::traits_type, String::allocator_type>
```

Definition at line 133 of file config.h.

8.10.2.7 LargestInt

```
using Json::LargestInt = typedef Int64
```

Definition at line 123 of file config.h.

8.10.2.8 LargestUInt

```
using Json::LargestUInt = typedef UInt64
```

Definition at line 124 of file config.h.

8.10.2.9 OStream

```
using Json::OStream = typedef std::ostream
```

Definition at line 140 of file config.h.

8.10.2.10 OStringStream

```
using Json::OStringStream = typedef std::basic_ostringstream<String::value_type, String↩
::traits_type, String::allocator_type>
```

Definition at line 136 of file config.h.

8.10.2.11 String

```
using Json::String = typedef std::basic_string<char, std::char_traits<char>, Allocator<char>
>
```

Definition at line 132 of file config.h.

8.10.2.12 UInt

```
using Json::UInt = typedef unsigned int
```

Definition at line 109 of file config.h.

8.10.2.13 UInt64

```
using Json::UInt64 = typedef uint64_t
```

Definition at line 121 of file config.h.

8.10.3 Enumeration Type Documentation

8.10.3.1 CommentPlacement

```
enum Json::CommentPlacement
```

Enumerator

commentBefore	a comment placed on the line before a value
commentAfterOnSameLine	a comment just after a value on the same line
commentAfter	a comment on the line after a value (only make sense for
numberOfCommentPlacement	root value)

Definition at line 119 of file value.h.

8.10.3.2 PrecisionType

```
enum Json::PrecisionType
```

Type of precision for formatting of real values.

Enumerator

significantDigits	we set max number of significant digits in string
decimalPlaces	we set max number of digits after "." in string

Definition at line 129 of file value.h.

8.10.3.3 ValueType

```
enum Json::ValueType
```

Type of the value held by a Value object.

Enumerator

nullValue	'null' value
intValue	signed integer value
uintValue	unsigned integer value
realValue	double value
stringValue	UTF-8 string value.
booleanValue	bool value
arrayValue	array value (ordered list)
objectValue	object value (collection of name/value pairs).

Definition at line 108 of file value.h.

8.10.4 Function Documentation

8.10.4.1 operator"!=()

```
template<typename T , typename U >
bool Json::operator!= (
            const SecureAllocator< T > & ,
            const SecureAllocator< U > &  )
```

Definition at line 89 of file allocator.h.

8.10.4.2 operator<<()

```
JSON_API OStream & Json::operator<< (
            OStream & ,
            const Value & root )
```

Output using the StyledStreamWriter.

See also

Json::operator>>()

8.10.4.3 operator==()

```
template<typename T , typename U >
bool Json::operator== (
            const SecureAllocator< T > & ,
            const SecureAllocator< U > &  )
```

Definition at line 84 of file allocator.h.

8.10.4.4 operator>>()

```
JSON_API IStream & Json::operator>> (
            IStream & ,
            Value &  )
```

Read from 'sin' into 'root'.

Always keep comments from the input JSON.

This can be used to read a file into a particular sub-object. For example:

```
Json::Value root;
cin » root["dir"]["file"];
cout « root;
```

Result:

```
* {
* "dir": {
*    "file": {
*    // The input stream JSON would be nested here.
*    }
* }
* }
*
```

Exceptions

std::exception	on parse error.

See also

Json::operator<<()

8.10.4.5 parseFromStream()

```
bool JSON_API Json::parseFromStream (
            CharReader::Factory const & ,
            IStream & ,
            Value * root,
            String * errs )
```

Consume entire stream and use its begin/end. Someday we might have a real StreamReader, but for now this is convenient.

8.10.4.6 swap()

```
void Json::swap (
            Value & a,
            Value & b )  [inline]
```

Definition at line 992 of file value.h.

References swap(), and Json::Value::swap().

8.10.4.7 throwLogicError()

```
JSONCPP_NORETURN void Json::throwLogicError (
            String const & msg )
```

used internally

References throwLogicError().

8.10.4.8 throwRuntimeError()

```
JSONCPP_NORETURN void Json::throwRuntimeError (
            String const & msg )
```

used internally

References throwRuntimeError().

8.10.4.9 valueToQuotedString()

```
String JSON_API Json::valueToQuotedString (
            const char * value )
```

8.10.4.10 valueToString() [1/6]

```
String JSON_API Json::valueToString (
            bool value )
```

8.10.4.11 valueToString() [2/6]

```
String JSON_API Json::valueToString (
            double value,
            unsigned int precision = Value::defaultRealPrecision,
            PrecisionType precisionType = PrecisionType::significantDigits )
```

8.10.4.12 valueToString() [3/6]

```
String JSON_API Json::valueToString (
            Int value )
```

8.10.4.13 valueToString() [4/6]

```
String JSON_API Json::valueToString (
            LargestInt value )
```

8.10.4.14 valueToString() [5/6]

```
String JSON_API Json::valueToString (
            LargestUInt value )
```

8.10.4.15 valueToString() [6/6]

```
String JSON_API Json::valueToString (
            UInt value )
```

8.10.4.16 writeString()

```
String JSON_API Json::writeString (
            StreamWriter::Factory const & factory,
            Value const & root )
```

Write into stringstream, then return string, for convenience. A StreamWriter will be created from the factory, used, and then deleted.

8.11 std Namespace Reference

Data Structures

- struct hash< el::Level >

8.12 WIP Namespace Reference

Namespace for work in progress.

Functions

- void exampleEasyLogging ()

  Example of how to use easylogging with a configuration file.

8.12.1 Detailed Description

Namespace for work in progress.

Todo
- Github
- "Dev-Ops"
- Doxygen settings
- Template-Comment
- Template-Header-Comment

- This namespace is for code that is not finished yet
- It is used to keep the main namespace clean

8.12.2 Function Documentation

8.12.2.1 exampleEasyLogging()

```
void WIP::exampleEasyLogging ( )
```

Example of how to use easylogging with a configuration file.

- This function is an example of how to use easylogging
- The configuration file is located in ../conf
- Before proper integration, config has to be done properly

  Todo

Definition at line 53 of file main.cpp.

References LOG, el::Loggers::reconfigureAllLoggers(), and el::Loggers::reconfigureLogger().

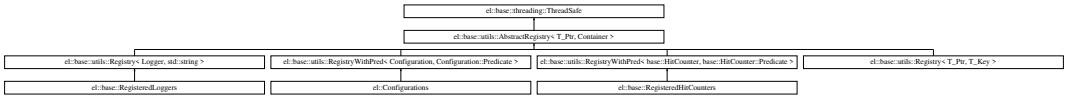
Chapter 9

Data Structure Documentation

9.1 el::base::utils::AbstractRegistry< T_Ptr, Container > Class Template Reference

Abstract registry (aka repository) that provides basic interface for pointer repository specified by T_Ptr type.

Inheritance diagram for el::base::utils::AbstractRegistry< T_Ptr, Container >:



Public Types

- typedef Container::iterator iterator
- typedef Container::const_iterator const_iterator

Public Member Functions

- AbstractRegistry (void)

  Default constructor.
- AbstractRegistry (AbstractRegistry &&sr)

  Move constructor that is useful for base classes.
- bool operator== (const AbstractRegistry< T_Ptr, Container > &other)
- bool operator!= (const AbstractRegistry< T_Ptr, Container > &other)
- AbstractRegistry & operator= (AbstractRegistry &&sr)

  Assignment move operator.
- virtual ~AbstractRegistry (void)
- virtual iterator begin (void) ELPP_FINAL
- virtual iterator end (void) ELPP_FINAL
- virtual const_iterator cbegin (void) const ELPP_FINAL
- virtual const_iterator cend (void) const ELPP_FINAL
- virtual bool empty (void) const ELPP_FINAL
- virtual std::size_t size (void) const ELPP_FINAL
- virtual Container & list (void) ELPP_FINAL

  Returns underlying container by reference.
- virtual const Container & list (void) const ELPP_FINAL

  Returns underlying container by constant reference.
- virtual void unregisterAll (void)=0

  Unregisters all the pointers from current repository.

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Protected Member Functions

- virtual void deepCopy (const AbstractRegistry< T_Ptr, Container > &)=0
- void reinitDeepCopy (const AbstractRegistry< T_Ptr, Container > &sr)

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

Private Attributes

- Container m_list

9.1.1 Detailed Description

template<typename T_Ptr, typename Container>
class el::base::utils::AbstractRegistry< T_Ptr, Container >

Abstract registry (aka repository) that provides basic interface for pointer repository specified by T_Ptr type.

@detail Most of the functions are virtual final methods but anything implementing this abstract class should implement unregisterAll() and deepCopy(const AbstractRegistry<T_Ptr, Container>&) and write registerNew() method according to container and few more methods; get() to find element, unregister() to unregister single entry. Please note that this is thread-unsafe and should also implement thread-safety mechanisms in implementation.

Definition at line 1255 of file easylogging++.h.

9.1.2 Member Typedef Documentation

9.1.2.1 const_iterator

```
template<typename T_Ptr , typename Container >
typedef Container::const_iterator el::base::utils::AbstractRegistry< T_Ptr, Container >↩
::const_iterator
```

Definition at line 1258 of file easylogging++.h.

9.1.2.2 iterator

```
template<typename T_Ptr , typename Container >
typedef Container::iterator el::base::utils::AbstractRegistry< T_Ptr, Container >::iterator
```

Definition at line 1257 of file easylogging++.h.

9.1.3 Constructor & Destructor Documentation

9.1.3.1 AbstractRegistry() [1/2]

```
template<typename T_Ptr , typename Container >
el::base::utils::AbstractRegistry< T_Ptr, Container >::AbstractRegistry (
            void  )  [inline]
```

Default constructor.

Definition at line 1261 of file easylogging++.h.

9.1.3.2 AbstractRegistry() [2/2]

```
template<typename T_Ptr , typename Container >
el::base::utils::AbstractRegistry< T_Ptr, Container >::AbstractRegistry (
            AbstractRegistry< T_Ptr, Container > && sr )  [inline]
```

Move constructor that is useful for base classes.

Definition at line 1264 of file easylogging++.h.

9.1.3.3 ~AbstractRegistry()

```
template<typename T_Ptr , typename Container >
virtual el::base::utils::AbstractRegistry< T_Ptr, Container >::~AbstractRegistry (
            void  )  [inline], [virtual]
```

Definition at line 1306 of file easylogging++.h.

9.1.4 Member Function Documentation

9.1.4.1 begin()

```
template<typename T_Ptr , typename Container >
virtual iterator el::base::utils::AbstractRegistry< T_Ptr, Container >::begin (
            void  )  [inline], [virtual]
```

Returns

Iterator pointer from start of repository

Definition at line 1310 of file easylogging++.h.

9.1.4.2 cbegin()

```
template<typename T_Ptr , typename Container >
virtual const_iterator el::base::utils::AbstractRegistry< T_Ptr, Container >::cbegin (
            void  ) const  [inline], [virtual]
```

Returns

Constant iterator pointer from start of repository

Definition at line 1321 of file easylogging++.h.

9.1.4.3 cend()

```
template<typename T_Ptr , typename Container >
virtual const_iterator el::base::utils::AbstractRegistry< T_Ptr, Container >::cend (
            void  ) const  [inline], [virtual]
```

Returns

End of repository

Definition at line 1326 of file easylogging++.h.

9.1.4.4 deepCopy()

```
template<typename T_Ptr , typename Container >
virtual void el::base::utils::AbstractRegistry< T_Ptr, Container >::deepCopy (
            const AbstractRegistry< T_Ptr, Container > &  )  [protected], [pure virtual]
```

Implemented in el::base::utils::RegistryWithPred< T_Ptr, Pred >.

9.1.4.5 empty()

```
template<typename T_Ptr , typename Container >
virtual bool el::base::utils::AbstractRegistry< T_Ptr, Container >::empty (
            void  ) const  [inline], [virtual]
```

Returns

Whether or not repository is empty

Definition at line 1331 of file easylogging++.h.

9.1.4.6 end()

```
template<typename T_Ptr , typename Container >
virtual iterator el::base::utils::AbstractRegistry< T_Ptr, Container >::end (
            void  )  [inline], [virtual]
```

Returns

Iterator pointer from end of repository

Definition at line 1315 of file easylogging++.h.

9.1.4.7 list() [1/2]

```
template<typename T_Ptr , typename Container >
virtual const Container & el::base::utils::AbstractRegistry< T_Ptr, Container >::list (
            void  ) const  [inline], [virtual]
```

Returns underlying container by constant reference.

Definition at line 1346 of file easylogging++.h.

9.1.4.8 list() [2/2]

```
template<typename T_Ptr , typename Container >
virtual Container & el::base::utils::AbstractRegistry< T_Ptr, Container >::list (
            void  )  [inline], [virtual]
```

Returns underlying container by reference.

Definition at line 1341 of file easylogging++.h.

9.1.4.9 operator"!=()

```
template<typename T_Ptr , typename Container >
bool el::base::utils::AbstractRegistry< T_Ptr, Container >::operator!= (
            const AbstractRegistry< T_Ptr, Container > & other )  [inline]
```

Definition at line 1284 of file easylogging++.h.

References el::base::utils::AbstractRegistry< T_Ptr, Container >::m_list, and el::base::utils::AbstractRegistry< T_Ptr, Container >::s

9.1.4.10 operator=()

```
template<typename T_Ptr , typename Container >
AbstractRegistry & el::base::utils::AbstractRegistry< T_Ptr, Container >::operator= (
            AbstractRegistry< T_Ptr, Container > && sr )  [inline]
```

Assignment move operator.

Definition at line 1297 of file easylogging++.h.

9.1.4.11 operator==()

```
template<typename T_Ptr , typename Container >
bool el::base::utils::AbstractRegistry< T_Ptr, Container >::operator== (
            const AbstractRegistry< T_Ptr, Container > & other )  [inline]
```

Definition at line 1272 of file easylogging++.h.

References el::base::utils::AbstractRegistry< T_Ptr, Container >::m_list, and el::base::utils::AbstractRegistry< T_Ptr, Container >::s

9.1.4.12 reinitDeepCopy()

```
template<typename T_Ptr , typename Container >
void el::base::utils::AbstractRegistry< T_Ptr, Container >::reinitDeepCopy (
            const AbstractRegistry< T_Ptr, Container > & sr )  [inline], [protected]
```

Definition at line 1355 of file easylogging++.h.

9.1.4.13 size()

```
template<typename T_Ptr , typename Container >
virtual std::size_t el::base::utils::AbstractRegistry< T_Ptr, Container >::size (
            void  ) const  [inline], [virtual]
```

Returns

Size of repository

Definition at line 1336 of file easylogging++.h.

9.1.4.14 unregisterAll()

```
template<typename T_Ptr , typename Container >
virtual void el::base::utils::AbstractRegistry< T_Ptr, Container >::unregisterAll (
            void  )  [pure virtual]
```

Unregisters all the pointers from current repository.

Implemented in el::base::utils::Registry< T_Ptr, T_Key >, el::base::utils::Registry< Logger, std::string >, el::base::utils::RegistryWithPred< T_Ptr, Pred >, el::base::utils::RegistryWithPred< base::HitCounter, base::HitCounter::Predicate > and el::base::utils::RegistryWithPred< Configuration, Configuration::Predicate >.

9.1.5 Field Documentation

9.1.5.1 m_list

```
template<typename T_Ptr , typename Container >
Container el::base::utils::AbstractRegistry< T_Ptr, Container >::m_list  [private]
```

Definition at line 1361 of file easylogging++.h.

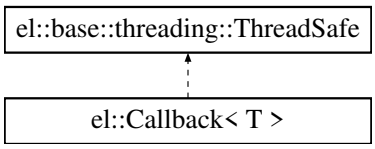
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.2 el::Callback< T > Class Template Reference

`#include <easylogging++.h>`

Inheritance diagram for el::Callback< T >:



Public Member Functions

- Callback (void)
- bool enabled (void) const
- void setEnabled (bool enabled)

Protected Member Functions

- virtual void handle (const T *handlePtr)=0

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Private Attributes

- bool m_enabled

9.2.1 Detailed Description

template<typename T>
class el::Callback< T >

Definition at line 2144 of file easylogging++.h.

9.2.2 Constructor & Destructor Documentation

9.2.2.1 Callback()

```
template<typename T >
el::Callback< T >::Callback (
            void  )  [inline]
```

Definition at line 2146 of file easylogging++.h.

9.2.3 Member Function Documentation

9.2.3.1 enabled()

```
template<typename T >
bool el::Callback< T >::enabled (
            void  ) const  [inline]
```

Definition at line 2147 of file easylogging++.h.

9.2.3.2 handle()

```
template<typename T >
virtual void el::Callback< T >::handle (
            const T * handlePtr )  [protected], [pure virtual]
```

Implemented in el::LogDispatchCallback, and el::base::DefaultLogDispatchCallback.

9.2.3.3 setEnabled()

```
template<typename T >
void el::Callback< T >::setEnabled (
            bool enabled )  [inline]
```

Definition at line 2150 of file easylogging++.h.

9.2.4 Field Documentation

9.2.4.1 m_enabled

```
template<typename T >
bool el::Callback< T >::m_enabled  [private]
```

Definition at line 2157 of file easylogging++.h.

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

- include/easylogging++.h

9.3 Json::CharReader Class Reference

`#include <reader.h>`

Data Structures

- class Factory

Public Member Functions

- virtual ~CharReader ()=default
- virtual bool parse (char const *beginDoc, char const *endDoc, Value *root, String *errs)=0

  Read a Value from a JSON document. The document must be a UTF-8 encoded string containing the document to read.

9.3.1 Detailed Description

Interface for reading JSON from a char array.

Definition at line 245 of file reader.h.

9.3.2 Constructor & Destructor Documentation

9.3.2.1 ~CharReader()

```
virtual Json::CharReader::~CharReader ( )  [virtual], [default]
```

9.3.3 Member Function Documentation

9.3.3.1 parse()

```
virtual bool Json::CharReader::parse (
            char const * beginDoc,
            char const * endDoc,
            Value * root,
            String * errs )  [pure virtual]
```

Read a Value from a JSON document. The document must be a UTF-8 encoded string containing the document to read.

Parameters

	beginDoc	Pointer on the beginning of the UTF-8 encoded string of the document to read.
	endDoc	Pointer on the end of the UTF-8 encoded string of the document to read. Must be >= beginDoc.
out	*root*	Contains the root value of the document if it was successfully parsed.
out	*errs*	Formatted error messages (if not NULL) a user friendly string that lists errors in the parsed document.

Returns

`true` if the document was successfully parsed, `false` if an error occurred.

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

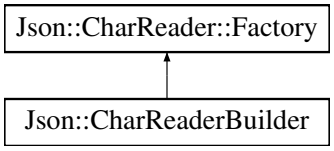
- include/jsoncpp/reader.h

9.4 Json::CharReaderBuilder Class Reference

Build a CharReader implementation.

`#include <reader.h>`

Inheritance diagram for Json::CharReaderBuilder:



Public Member Functions

- CharReaderBuilder ()
- ~CharReaderBuilder () override
- CharReader * newCharReader () const override

  Allocate a CharReader via operator new().
- bool validate (Json::Value *invalid) const
- Value & operator[] (const String &key)

Public Member Functions inherited from Json::CharReader::Factory

- virtual ~Factory ()=default

Static Public Member Functions

- static void setDefaults (Json::Value *settings)
- static void strictMode (Json::Value *settings)

Data Fields

- Json::Value settings_

9.4.1 Detailed Description

Build a CharReader implementation.

Usage:
```
using namespace Json;
CharReaderBuilder builder;
builder["collectComments"] = false;
Value value;
String errs;
bool ok = parseFromStream(builder, std::cin, &value, &errs);
```

Definition at line 289 of file reader.h.

9.4.2 Constructor & Destructor Documentation

9.4.2.1 CharReaderBuilder()

```
Json::CharReaderBuilder::CharReaderBuilder ( )
```

9.4.2.2 ~CharReaderBuilder()

```
Json::CharReaderBuilder::~CharReaderBuilder ( )  [override]
```

9.4.3 Member Function Documentation

9.4.3.1 newCharReader()

```
CharReader * Json::CharReaderBuilder::newCharReader ( ) const  [override], [virtual]
```

Allocate a CharReader via operator new().

Exceptions

std::exception	if something goes wrong (e.g. invalid settings)

Implements Json::CharReader::Factory.

9.4.3.2 operator[]()

```
Value & Json::CharReaderBuilder::operator[] (
            const String & key )
```

A simple way to update a specific setting.

9.4.3.3 setDefaults()

```
static void Json::CharReaderBuilder::setDefaults (
            Json::Value * settings )  [static]
```

Called by ctor, but you can use this to reset settings_.

Precondition

'settings' != NULL (but Json::null is fine)

Remarks

Defaults:

9.4.3.4 strictMode()

```
static void Json::CharReaderBuilder::strictMode (
            Json::Value * settings )  [static]
```

Same as old Features::strictMode().

Precondition

'settings' != NULL (but Json::null is fine)

Remarks

Defaults:

9.4.3.5 validate()

```
bool Json::CharReaderBuilder::validate (
            Json::Value * invalid ) const
```

Returns

true if 'settings' are legal and consistent; otherwise, indicate bad settings via 'invalid'.

9.4.4 Field Documentation

9.4.4.1 settings_

```
Json::Value Json::CharReaderBuilder::settings_
```

Configuration of this builder. These are case-sensitive. Available settings (case-sensitive):

- `"collectComments": false or true`
  - true to collect comment and allow writing them back during serialization, false to discard comments. This parameter is ignored if allowComments is false.
- `"allowComments": false or true`
  - true if comments are allowed.
- `"allowTrailingCommas": false or true`
  - true if trailing commas in objects and arrays are allowed.
- `"strictRoot": false or true`
  - true if root must be either an array or an object value
- `"allowDroppedNullPlaceholders": false or true`
  - true if dropped null placeholders are allowed. (See StreamWriterBuilder.)
- `"allowNumericKeys": false or true`
  - true if numeric object keys are allowed.
- `"allowSingleQuotes": false or true`
  - true if ' are allowed for strings (both keys and values)
- `"stackLimit": integer`
  - Exceeding stackLimit (recursive depth of `readValue()`) will cause an exception.
  - This is a security issue (seg-faults caused by deeply nested JSON), so the default is low.
- `"failIfExtra": false or true`
  - If true, `parse()` returns false when extra non-whitespace trails the JSON value in the input string.
- `"rejectDupKeys": false or true`
  - If true, `parse()` returns false when a key is duplicated within an object.
- `"allowSpecialFloats": false or true`
  - If true, special float values (NaNs and infinities) are allowed and their values are lossfree restorable.
- `"skipBom": false or true`
  - If true, if the input starts with the Unicode byte order mark (BOM), it is skipped.

You can examine 'settings_` yourself to see the defaults. You can also write and read them just like any JSON Value.

See also

setDefaults()

Definition at line 335 of file reader.h.

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

- include/jsoncpp/reader.h

9.5 el::base::utils::CommandLineArgs Class Reference

Command line arguments for application if specified using el::Helpers::setArgs(..) or START_EASYLOGGINGPP(..)

Public Member Functions

- CommandLineArgs (void)
- CommandLineArgs (int argc, const char **argv)
- CommandLineArgs (int argc, char **argv)
- virtual ~CommandLineArgs (void)
- void setArgs (int argc, const char **argv)

  Sets arguments and parses them.
- void setArgs (int argc, char **argv)

  Sets arguments and parses them.
- bool hasParamWithValue (const char *paramKey) const

  Returns true if arguments contain paramKey with a value (separated by '=')
- const char * getParamValue (const char *paramKey) const

  Returns value of arguments.
- bool hasParam (const char *paramKey) const

  Return true if arguments has a param (not having a value) i,e without '='.
- bool empty (void) const

  Returns true if no params available. This exclude argv[0].
- std::size_t size (void) const

  Returns total number of arguments. This exclude argv[0].

Private Attributes

- int m_argc
- char ** m_argv
- std::unordered_map< std::string, std::string > m_paramsWithValue
- std::vector< std::string > m_params

Friends

- base::type::ostream_t & operator<< (base::type::ostream_t &os, const CommandLineArgs &c)

9.5.1 Detailed Description

Command line arguments for application if specified using el::Helpers::setArgs(..) or START_EASYLOGGINGPP(..)

Definition at line 1211 of file easylogging++.h.

9.5.2 Constructor & Destructor Documentation

9.5.2.1 CommandLineArgs() [1/3]

```
el::base::utils::CommandLineArgs::CommandLineArgs (
            void  )  [inline]
```

Definition at line 1213 of file easylogging++.h.

9.5.2.2 CommandLineArgs() [2/3]

```
el::base::utils::CommandLineArgs::CommandLineArgs (
            int argc,
            const char ** argv )  [inline]
```

Definition at line 1216 of file easylogging++.h.

9.5.2.3 CommandLineArgs() [3/3]

```
el::base::utils::CommandLineArgs::CommandLineArgs (
            int argc,
            char ** argv )  [inline]
```

Definition at line 1219 of file easylogging++.h.

9.5.2.4 ~CommandLineArgs()

```
virtual el::base::utils::CommandLineArgs::~CommandLineArgs (
            void  )  [inline], [virtual]
```

Definition at line 1222 of file easylogging++.h.

9.5.3 Member Function Documentation

9.5.3.1 empty()

```
bool el::base::utils::CommandLineArgs::empty (
            void  ) const
```

Returns true if no params available. This exclude argv[0].

Definition at line 1360 of file easylogging++.cc.

References m_params, and m_paramsWithValue.

9.5.3.2 getParamValue()

```
const char * el::base::utils::CommandLineArgs::getParamValue (
            const char * paramKey ) const
```

Returns value of arguments.

See also

hasParamWithValue(const char*)

Definition at line 1351 of file easylogging++.cc.

References m_paramsWithValue.

9.5.3.3 hasParam()

```
bool el::base::utils::CommandLineArgs::hasParam (
            const char * paramKey ) const
```

Return true if arguments has a param (not having a value) i,e without '='.

Definition at line 1356 of file easylogging++.cc.

References m_params.

9.5.3.4 hasParamWithValue()

```
bool el::base::utils::CommandLineArgs::hasParamWithValue (
            const char * paramKey ) const
```

Returns true if arguments contain paramKey with a value (separated by '=')

Definition at line 1347 of file easylogging++.cc.

References m_paramsWithValue.

9.5.3.5 setArgs() [1/2]

```
void el::base::utils::CommandLineArgs::setArgs (
            int argc,
            char ** argv )
```

Sets arguments and parses them.

Definition at line 1317 of file easylogging++.cc.

References ELPP_INTERNAL_INFO, getParamValue(), hasParam(), hasParamWithValue(), m_argc, m_argv, m_params, and m_paramsWithValue.

9.5.3.6 setArgs() [2/2]

```
void el::base::utils::CommandLineArgs::setArgs (
            int argc,
            const char ** argv )  [inline]
```

Sets arguments and parses them.

Definition at line 1224 of file easylogging++.h.

9.5.3.7 size()

```
std::size_t el::base::utils::CommandLineArgs::size (
            void  ) const
```

Returns total number of arguments. This exclude argv[0].

Definition at line 1364 of file easylogging++.cc.

References m_params, and m_paramsWithValue.

9.5.4 Friends And Related Symbol Documentation

9.5.4.1 operator<<

```
base::type::ostream_t & operator<< (
            base::type::ostream_t & os,
            const CommandLineArgs & c )  [friend]
```

Definition at line 1368 of file easylogging++.cc.

9.5.5 Field Documentation

9.5.5.1 m_argc

```
int el::base::utils::CommandLineArgs::m_argc  [private]
```

Definition at line 1243 of file easylogging++.h.

9.5.5.2 m_argv

```
char** el::base::utils::CommandLineArgs::m_argv  [private]
```

Definition at line 1244 of file easylogging++.h.

9.5.5.3 m_params

```
std::vector<std::string> el::base::utils::CommandLineArgs::m_params  [private]
```

Definition at line 1246 of file easylogging++.h.

9.5.5.4 m_paramsWithValue

```
std::unordered_map<std::string, std::string> el::base::utils::CommandLineArgs::m_paramsWith↩
Value  [private]
```

Definition at line 1245 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.6 Json::Value::Comments Class Reference

Public Member Functions

- Comments ()=default
- Comments (const Comments &that)
- Comments (Comments &&that) noexcept
- Comments & operator= (const Comments &that)
- Comments & operator= (Comments &&that) noexcept
- bool has (CommentPlacement slot) const
- String get (CommentPlacement slot) const
- void set (CommentPlacement slot, String comment)

Private Types

- using Array = std::array< String, numberOfCommentPlacement >

Private Attributes

- std::unique_ptr< Array > ptr_

9.6.1 Detailed Description

Definition at line 659 of file value.h.

9.6.2 Member Typedef Documentation

9.6.2.1 Array

```
using Json::Value::Comments::Array = std::array<String, numberOfCommentPlacement>  [private]
```

Definition at line 671 of file value.h.

9.6.3 Constructor & Destructor Documentation

9.6.3.1 Comments() [1/3]

```
Json::Value::Comments::Comments ( )  [default]
```

9.6.3.2 Comments() [2/3]

```
Json::Value::Comments::Comments (
            const Comments & that )
```

9.6.3.3 Comments() [3/3]

```
Json::Value::Comments::Comments (
            Comments && that )  [noexcept]
```

9.6.4 Member Function Documentation

9.6.4.1 get()

```
String Json::Value::Comments::get (
            CommentPlacement slot ) const
```

9.6.4.2 has()

```
bool Json::Value::Comments::has (
            CommentPlacement slot ) const
```

9.6.4.3 operator=() [1/2]

```
Comments & Json::Value::Comments::operator= (
            Comments && that )  [noexcept]
```

9.6.4.4 operator=() [2/2]

```
Comments & Json::Value::Comments::operator= (
            const Comments & that )
```

9.6.4.5 set()

```
void Json::Value::Comments::set (
            CommentPlacement slot,
            String comment )
```

9.6.5 Field Documentation

9.6.5.1 ptr_

```
std::unique_ptr<Array> Json::Value::Comments::ptr_  [private]
```

Definition at line 672 of file value.h.

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

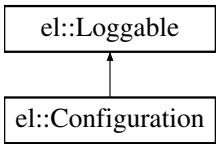
- include/jsoncpp/value.h

9.7 el::Configuration Class Reference

Represents single configuration that has representing level, configuration type and a string based value.

`#include <easylogging++.h>`

Inheritance diagram for el::Configuration:



Data Structures

- class Predicate

  Used to find configuration from configuration (pointers) repository. Avoid using it.

Public Member Functions

- Configuration (const Configuration &c)
- Configuration & operator= (const Configuration &c)
- virtual ~Configuration (void)
- Configuration (Level level, ConfigurationType configurationType, const std::string &value)

  Full constructor used to sets value of configuration.
- Level level (void) const

  Gets level of current configuration.
- ConfigurationType configurationType (void) const

  Gets configuration type of current configuration.
- const std::string & value (void) const

  Gets string based configuration value.
- void setValue (const std::string &value)

  Set string based configuration value.
- virtual void log (el::base::type::ostream_t &os) const

Public Member Functions inherited from el::Loggable

- virtual ~Loggable (void)

Private Attributes

- Level m_level
- ConfigurationType m_configurationType
- std::string m_value

9.7.1 Detailed Description

Represents single configuration that has representing level, configuration type and a string based value.

@detail String based value means any value either its boolean, integer or string itself, it will be embedded inside quotes and will be parsed later.

Consider some examples below:

- el::Configuration confEnabledInfo(el::Level::Info, el::ConfigurationType::Enabled, "true");
- el::Configuration confMaxLogFileSizeInfo(el::Level::Info, el::ConfigurationType::MaxLogFileSize, "2048");
- el::Configuration confFilenameInfo(el::Level::Info, el::ConfigurationType::Filename, "/var/log/my.log");

Definition at line 1673 of file easylogging++.h.

9.7.2 Constructor & Destructor Documentation

9.7.2.1 Configuration() [1/2]

```
el::Configuration::Configuration (
            const Configuration & c )
```

Definition at line 235 of file easylogging++.cc.

9.7.2.2 ~Configuration()

```
virtual el::Configuration::~Configuration (
            void  )  [inline], [virtual]
```

Definition at line 1678 of file easylogging++.h.

9.7.2.3 Configuration() [2/2]

```
el::Configuration::Configuration (
            Level level,
            ConfigurationType configurationType,
            const std::string & value )
```

Full constructor used to sets value of configuration.

Definition at line 251 of file easylogging++.cc.

9.7.3 Member Function Documentation

9.7.3.1 configurationType()

```
ConfigurationType el::Configuration::configurationType (
            void  ) const  [inline]
```

Gets configuration type of current configuration.

Definition at line 1690 of file easylogging++.h.

9.7.3.2 level()

```
Level el::Configuration::level (
            void  ) const  [inline]
```

Gets level of current configuration.

Definition at line 1685 of file easylogging++.h.

9.7.3.3 log()

```
void el::Configuration::log (
            el::base::type::ostream_t & os ) const  [virtual]
```

Implements el::Loggable.

Definition at line 257 of file easylogging++.cc.

References el::ConfigurationTypeHelper::convertToString(), el::LevelHelper::convertToString(), ELPP_LITERAL, m_configurationType, m_level, and m_value.

9.7.3.4 operator=()

```
Configuration & el::Configuration::operator= (
            const Configuration & c )
```

Definition at line 241 of file easylogging++.cc.

References m_configurationType, m_level, and m_value.

9.7.3.5 setValue()

```
void el::Configuration::setValue (
            const std::string & value )  [inline]
```

Set string based configuration value.

Parameters

value	Value to set. Values have to be std::string; For boolean values use "true", "false", for any integral values use them in quotes. They will be parsed when configuring

Definition at line 1702 of file easylogging++.h.

9.7.3.6 value()

```
const std::string & el::Configuration::value (
            void  ) const  [inline]
```

Gets string based configuration value.

Definition at line 1695 of file easylogging++.h.

9.7.4 Field Documentation

9.7.4.1 m_configurationType

```
ConfigurationType el::Configuration::m_configurationType  [private]
```

Definition at line 1722 of file easylogging++.h.

9.7.4.2 m_level

```
Level el::Configuration::m_level  [private]
```

Definition at line 1721 of file easylogging++.h.

9.7.4.3 m_value

```
std::string el::Configuration::m_value  [private]
```

Definition at line 1723 of file easylogging++.h.

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

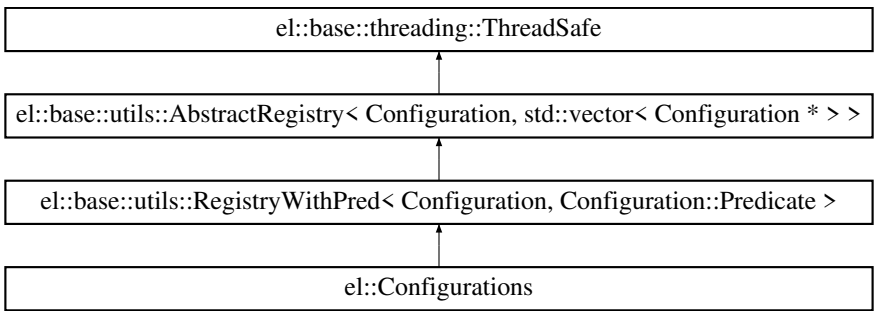
- include/easylogging++.h
- lib/easylogging++.cc

9.8 el::Configurations Class Reference

Thread-safe Configuration repository.

```
#include <easylogging++.h>
```

Inheritance diagram for el::Configurations:



Data Structures

- class Parser

  Parser used internally to parse configurations from file or text.

Public Member Functions

- Configurations (void)

  Default constructor with empty repository.
- Configurations (const std::string &configurationFile, bool useDefaultsForRemaining=true, Configurations *base=nullptr)

  Constructor used to set configurations using configuration file.
- virtual ~Configurations (void)
- bool parseFromFile (const std::string &configurationFile, Configurations *base=nullptr)

  Parses configuration from file.
- bool parseFromText (const std::string &configurationsString, Configurations *base=nullptr)

  Parse configurations from configuration string.
- void setFromBase (Configurations *base)

  Sets configuration based-off an existing configurations.
- bool hasConfiguration (ConfigurationType configurationType)

  Determines whether or not specified configuration type exists in the repository.
- bool hasConfiguration (Level level, ConfigurationType configurationType)

  Determines whether or not specified configuration type exists for specified level.
- void set (Level level, ConfigurationType configurationType, const std::string &value)

  Sets value of configuration for specified level.
- void set (Configuration *conf)

  Sets single configuration based on other single configuration.
- Configuration * get (Level level, ConfigurationType configurationType)
- void setGlobally (ConfigurationType configurationType, const std::string &value)

  Sets configuration for all levels.
- void clear (void)

  Clears repository so that all the configurations are unset.
- const std::string & configurationFile (void) const

  Gets configuration file used in parsing this configurations.
- void setToDefault (void)

  Sets configurations to "factory based" configurations.
- void setRemainingToDefault (void)

  Lets you set the remaining configurations to default.

Public Member Functions inherited from el::base::utils::RegistryWithPred< Configuration, Configuration::Predicate >

- RegistryWithPred (void)
- RegistryWithPred (const RegistryWithPred &sr)

  Copy constructor that is useful for base classes. Try to avoid this constructor, use move constructor.
- virtual ~RegistryWithPred (void)
- RegistryWithPred & operator= (const RegistryWithPred &sr)

  Assignment operator that unregisters all the existing registries and deeply copies each of repo element.

Public Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- AbstractRegistry (void)

  Default constructor.
- AbstractRegistry (AbstractRegistry &&sr)

  Move constructor that is useful for base classes.
- bool operator== (const AbstractRegistry< T_Ptr, Container > &other)
- bool operator!= (const AbstractRegistry< T_Ptr, Container > &other)
- AbstractRegistry & operator= (AbstractRegistry &&sr)

  Assignment move operator.
- virtual ~AbstractRegistry (void)
- virtual iterator begin (void) ELPP_FINAL
- virtual iterator end (void) ELPP_FINAL
- virtual const_iterator cbegin (void) const ELPP_FINAL
- virtual const_iterator cend (void) const ELPP_FINAL
- virtual bool empty (void) const ELPP_FINAL
- virtual std::size_t size (void) const ELPP_FINAL
- virtual Container & list (void) ELPP_FINAL

  Returns underlying container by reference.
- virtual const Container & list (void) const ELPP_FINAL

  Returns underlying container by constant reference.

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Private Member Functions

- void unsafeSetIfNotExist (Level level, ConfigurationType configurationType, const std::string &value)

  Unsafely sets configuration if does not already exist.
- void unsafeSet (Level level, ConfigurationType configurationType, const std::string &value)

  Thread unsafe set.
- void setGlobally (ConfigurationType configurationType, const std::string &value, bool includeGlobalLevel)

  Sets configurations for all levels including Level::Global if includeGlobalLevel is true.
- void unsafeSetGlobally (ConfigurationType configurationType, const std::string &value, bool includeGlobal↩ Level)

  Sets configurations (Unsafely) for all levels including Level::Global if includeGlobalLevel is true.

Private Attributes

- std::string m_configurationFile
- bool m_isFromFile

Friends

- class el::Loggers

Additional Inherited Members

Public Types inherited from el::base::utils::RegistryWithPred< Configuration, Configuration::Predicate >

- typedef RegistryWithPred< Configuration, Configuration::Predicate >::iterator iterator
- typedef RegistryWithPred< Configuration, Configuration::Predicate >::const_iterator const_iterator

Public Types inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- typedef Container::iterator iterator
- typedef Container::const_iterator const_iterator

Protected Member Functions inherited from el::base::utils::RegistryWithPred< Configuration, Configuration::Predicate >

- virtual void unregisterAll (void) ELPP_FINAL

  Unregisters all the pointers from current repository.
- virtual void unregister (Configuration *&ptr) ELPP_FINAL
- virtual void registerNew (Configuration *ptr) ELPP_FINAL
- Configuration * get (const T &arg1, const T2 arg2)

  Gets pointer from repository with specified arguments. Arguments are passed to predicate in order to validate pointer.

Protected Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- virtual void deepCopy (const AbstractRegistry< T_Ptr, Container > &)=0
- void reinitDeepCopy (const AbstractRegistry< T_Ptr, Container > &sr)

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

9.8.1 Detailed Description

Thread-safe Configuration repository.

@detail This repository represents configurations for all the levels and configuration type mapped to a value.

Definition at line 1729 of file easylogging++.h.

9.8.2 Constructor & Destructor Documentation

9.8.2.1 Configurations() [1/2]

```
el::Configurations::Configurations (
            void  )
```

Default constructor with empty repository.

Definition at line 275 of file easylogging++.cc.

9.8.2.2 Configurations() [2/2]

```
el::Configurations::Configurations (
            const std::string & configurationFile,
            bool useDefaultsForRemaining = true,
            Configurations * base = nullptr )
```

Constructor used to set configurations using configuration file.

Parameters

configurationFile	Full path to configuration file
useDefaultsForRemaining	Lets you set the remaining configurations to default.
base	If provided, this configuration will be based off existing repository that this argument is pointing to.

See also

parseFromFile(const std::string&, Configurations* base)

setRemainingToDefault()

Definition at line 280 of file easylogging++.cc.

References configurationFile(), parseFromFile(), and setRemainingToDefault().

9.8.2.3 ~Configurations()

```
virtual el::Configurations::~Configurations (
            void  )  [inline], [virtual]
```

Definition at line 1743 of file easylogging++.h.

9.8.3 Member Function Documentation

9.8.3.1 clear()

```
void el::Configurations::clear (
            void  )  [inline]
```

Clears repository so that all the configurations are unset.

Definition at line 1811 of file easylogging++.h.

9.8.3.2 configurationFile()

```
const std::string & el::Configurations::configurationFile (
            void  ) const  [inline]
```

Gets configuration file used in parsing this configurations.

@detail If this repository was set manually or by text this returns empty string.

Definition at line 1819 of file easylogging++.h.

9.8.3.3 get()

```
Configuration * el::Configurations::get (
            Level level,
            ConfigurationType configurationType )  [inline]
```

Definition at line 1797 of file easylogging++.h.

9.8.3.4 hasConfiguration() [1/2]

```
bool el::Configurations::hasConfiguration (
            ConfigurationType configurationType )
```

Determines whether or not specified configuration type exists in the repository.

@detail Returns as soon as first level is found.

Parameters

configurationType	Type of configuration to check existence for.

Definition at line 322 of file easylogging++.cc.

References el::LevelHelper::castFromInt(), el::LevelHelper::forEachLevel(), hasConfiguration(), and el::LevelHelper::kMinValid.

9.8.3.5 hasConfiguration() [2/2]

```
bool el::Configurations::hasConfiguration (
            Level level,
            ConfigurationType configurationType )
```

Determines whether or not specified configuration type exists for specified level.

Parameters

level	Level to check
configurationType	Type of configuration to check existence for.

Definition at line 334 of file easylogging++.cc.

References el::base::threading::ThreadSafe::lock().

9.8.3.6 parseFromFile()

```
bool el::Configurations::parseFromFile (
            const std::string & configurationFile,
            Configurations * base = nullptr )
```

Parses configuration from file.

Parameters

configurationFile	Full path to configuration file
base	Configurations to base new configuration repository off. This value is used when you want to use existing Configurations to base all the values and then set rest of configuration via configuration file.

Returns

True if successfully parsed, false otherwise. You may define 'ELPP_DEBUG_ASSERT_FAILURE' to make sure you do not proceed without successful parse.

Definition at line 290 of file easylogging++.cc.

References configurationFile(), ELPP_ASSERT, m_isFromFile, el::Configurations::Parser::parseFromFile(), and el::base::utils::File::pathExists().

9.8.3.7 parseFromText()

```
bool el::Configurations::parseFromText (
            const std::string & configurationsString,
            Configurations * base = nullptr )
```

Parse configurations from configuration string.

@detail This configuration string has same syntax as configuration file contents. Make sure all the necessary new line characters are provided.

Parameters

base	Configurations to base new configuration repository off. This value is used when you want to use existing Configurations to base all the values and then set rest of configuration via configuration text.

Returns

True if successfully parsed, false otherwise. You may define 'ELPP_DEBUG_ASSERT_FAILURE' to make sure you do not proceed without successful parse.

Definition at line 304 of file easylogging++.cc.

References m_isFromFile, and el::Configurations::Parser::parseFromText().

9.8.3.8 set() [1/2]

```
void el::Configurations::set (
            Configuration * conf )
```

Sets single configuration based on other single configuration.

See also

set(Level level, ConfigurationType configurationType, const std::string& value)

Definition at line 353 of file easylogging++.cc.

References el::Configuration::configurationType(), el::Configuration::level(), set(), and el::Configuration::value().

9.8.3.9 set() [2/2]

```
void el::Configurations::set (
            Level level,
            ConfigurationType configurationType,
            const std::string & value )
```

Sets value of configuration for specified level.

@detail Any existing configuration for specified level will be replaced. Also note that configuration types ConfigurationType::SubsecondPrecision and ConfigurationType::PerformanceTracking will be ignored if not set for Level::Global because these configurations are not dependant on level.

Parameters

level	Level to set configuration for (el::Level).
configurationType	Type of configuration (el::ConfigurationType)
value	A string based value. Regardless of what the data type of configuration is, it will always be string from users' point of view. This is then parsed later to be used internally.

See also

Configuration::setValue(const std::string& value)

el::Level

el::ConfigurationType

Definition at line 345 of file easylogging++.cc.

References el::Global, el::base::threading::ThreadSafe::lock(), unsafeSet(), and unsafeSetGlobally().

9.8.3.10 setFromBase()

```
void el::Configurations::setFromBase (
             Configurations * base )
```

Sets configuration based-off an existing configurations.

Parameters

base	Pointer to existing configurations.

Definition at line 312 of file easylogging++.cc.

References el::base::utils::AbstractRegistry< T_Ptr, Container >::list(), el::base::threading::ThreadSafe::lock(), and set().

9.8.3.11 setGlobally() [1/2]

```
void el::Configurations::setGlobally (
            ConfigurationType configurationType,
            const std::string & value )  [inline]
```

Sets configuration for all levels.

Parameters

configurationType	Type of configuration
value	String based value

See also

Configurations::set(Level level, ConfigurationType configurationType, const std::string& value)

Definition at line 1806 of file easylogging++.h.

9.8.3.12 setGlobally() [2/2]

```
void el::Configurations::setGlobally (
            ConfigurationType configurationType,
            const std::string & value,
            bool includeGlobalLevel )  [private]
```

Sets configurations for all levels including Level::Global if includeGlobalLevel is true.

See also

Configurations::setGlobally(ConfigurationType configurationType, const std::string& value)

Definition at line 555 of file easylogging++.cc.

References el::LevelHelper::castFromInt(), el::LevelHelper::forEachLevel(), el::Global, el::LevelHelper::kMinValid, and set().

9.8.3.13 setRemainingToDefault()

```
void el::Configurations::setRemainingToDefault (
            void  )
```

Lets you set the remaining configurations to default.

@detail By remaining, it means that the level/type a configuration does not exist for. This function is useful when you want to minimize chances of failures, e.g, if you have a configuration file that sets configuration for all the configurations except for Enabled or not, we use this so that ENABLED is set to default i.e, true. If you dont do this explicitly (either by calling this function or by using second param in Constructor and try to access a value, an error is thrown

Definition at line 384 of file easylogging++.cc.

References el::Debug, el::Enabled, el::Error, el::Fatal, el::Filename, el::Format, el::Global, el::base::consts::kDefaultLogFile, el::base::threading::ThreadSafe::lock(), el::MaxLogFileSize, el::PerformanceTracking, el::SubsecondPrecision, el::ToStandardOutput, el::Trace, unsafeSetIfNotExist(), and el::Verbose.

9.8.3.14 setToDefault()

```
void el::Configurations::setToDefault (
            void  )
```

Sets configurations to "factory based" configurations.

Definition at line 360 of file easylogging++.cc.

References el::Debug, el::Enabled, el::Error, el::Fatal, el::Filename, el::Format, el::base::consts::kDefaultLogFile, el::LogFlushThreshold, el::MaxLogFileSize, el::PerformanceTracking, set(), setGlobally(), el::SubsecondPrecision, el::ToFile, el::ToStandardOutput, el::Trace, and el::Verbose.

9.8.3.15 unsafeSet()

```
void el::Configurations::unsafeSet (
            Level level,
            ConfigurationType configurationType,
            const std::string & value )  [private]
```

Thread unsafe set.

Definition at line 543 of file easylogging++.cc.

References el::Global, el::base::utils::RegistryWithPred< Configuration, Configuration::Predicate >::registerNew(), el::Configuration::setValue(), and unsafeSetGlobally().

9.8.3.16 unsafeSetGlobally()

```
void el::Configurations::unsafeSetGlobally (
            ConfigurationType configurationType,
            const std::string & value,
            bool includeGlobalLevel )  [private]
```

Sets configurations (Unsafely) for all levels including Level::Global if includeGlobalLevel is true.

See also

Configurations::setGlobally(ConfigurationType configurationType, const std::string& value)

Definition at line 567 of file easylogging++.cc.

References el::LevelHelper::castFromInt(), el::LevelHelper::forEachLevel(), el::Global, el::LevelHelper::kMinValid, and unsafeSet().

9.8.3.17 unsafeSetIfNotExist()

```
void el::Configurations::unsafeSetIfNotExist (
            Level level,
            ConfigurationType configurationType,
            const std::string & value )  [private]
```

Unsafely sets configuration if does not already exist.

Definition at line 536 of file easylogging++.cc.

References unsafeSet().

9.8.4 Friends And Related Symbol Documentation

9.8.4.1 el::Loggers

```
friend class el::Loggers  [friend]
```

Definition at line 1877 of file easylogging++.h.

9.8.5 Field Documentation

9.8.5.1 m_configurationFile

```
std::string el::Configurations::m_configurationFile  [private]
```

Definition at line 1875 of file easylogging++.h.

9.8.5.2 m_isFromFile

```
bool el::Configurations::m_isFromFile  [private]
```

Definition at line 1876 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.9 el::ConfigurationStringToTypeItem Struct Reference

Data Fields

- const char * configString
- ConfigurationType configType

9.9.1 Detailed Description

Definition at line 196 of file easylogging++.cc.

9.9.2 Field Documentation

9.9.2.1 configString

```
const char* el::ConfigurationStringToTypeItem::configString
```

Definition at line 197 of file easylogging++.cc.

9.9.2.2 configType

```
ConfigurationType el::ConfigurationStringToTypeItem::configType
```

Definition at line 198 of file easylogging++.cc.

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

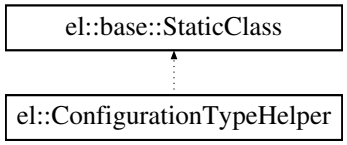
- lib/easylogging++.cc

9.10 el::ConfigurationTypeHelper Class Reference

Static class that contains helper functions for el::ConfigurationType.

`#include <easylogging++.h>`

Inheritance diagram for el::ConfigurationTypeHelper:



Static Public Member Functions

- static base::type::EnumType castToInt (ConfigurationType configurationType)
  Casts configuration type to int, useful for iterating through enum.
- static ConfigurationType castFromInt (base::type::EnumType c)
  Casts int(ushort) to configuration type, useful for iterating through enum.
- static const char * convertToString (ConfigurationType configurationType)
  Converts configuration type to associated const char.*
- static ConfigurationType convertFromString (const char *configStr)
  Converts from configStr to ConfigurationType.
- static void forEachConfigType (base::type::EnumType *startIndex, const std::function< bool(void)> &fn)
  Applies specified function to each configuration type starting from startIndex.

Static Public Attributes

- static const base::type::EnumType kMinValid = static_cast<base::type::EnumType>(ConfigurationType::Enabled)
  Represents minimum valid configuration type. Useful when iterating through enum.
- static const base::type::EnumType kMaxValid = static_cast<base::type::EnumType>(ConfigurationType::MaxLogFileSize)
  Represents maximum valid configuration type. This is used internally and you should not need it.

9.10.1 Detailed Description

Static class that contains helper functions for el::ConfigurationType.

Definition at line 665 of file easylogging++.h.

9.10.2 Member Function Documentation

9.10.2.1 castFromInt()

```
static ConfigurationType el::ConfigurationTypeHelper::castFromInt (
            base::type::EnumType c )  [inline], [static]
```

Casts int(ushort) to configuration type, useful for iterating through enum.

Definition at line 676 of file easylogging++.h.

9.10.2.2 castToInt()

```
static base::type::EnumType el::ConfigurationTypeHelper::castToInt (
            ConfigurationType configurationType )  [inline], [static]
```

Casts configuration type to int, useful for iterating through enum.

Definition at line 672 of file easylogging++.h.

9.10.2.3 convertFromString()

```
ConfigurationType el::ConfigurationTypeHelper::convertFromString (
            const char * configStr )  [static]
```

Converts from configStr to ConfigurationType.

Parameters

configStr	Upper case string based configuration type. Lower case is also valid but providing upper case is recommended.

Definition at line 214 of file easylogging++.cc.

References el::configStringToTypeMap, el::ConfigurationStringToTypeItem::configType, el::base::utils::Str::cStringCaseEq(), and el::Unknown.

9.10.2.4 convertToString()

```
const char * el::ConfigurationTypeHelper::convertToString (
            ConfigurationType configurationType )  [static]
```

Converts configuration type to associated const char*.

Returns

Upper case string based configuration type.

Definition at line 182 of file easylogging++.cc.

References el::Enabled, el::Filename, el::Format, el::LogFlushThreshold, el::MaxLogFileSize, el::PerformanceTracking, el::SubsecondPrecision, el::ToFile, and el::ToStandardOutput.

9.10.2.5 forEachConfigType()

```
void el::ConfigurationTypeHelper::forEachConfigType (
            base::type::EnumType * startIndex,
            const std::function< bool(void)> & fn )  [inline], [static]
```

Applies specified function to each configuration type starting from startIndex.

Parameters

startIndex	initial value to start the iteration from. This is passed by pointer and is left-shifted so this can be used inside function (fn) to represent current configuration type.
fn	function to apply with each configuration type. This bool represent whether or not to stop iterating through configurations.

Definition at line 223 of file easylogging++.cc.

References kMaxValid.

9.10.3 Field Documentation

9.10.3.1 kMaxValid

```
const base::type::EnumType el::ConfigurationTypeHelper::kMaxValid = static_cast<base::type::EnumType>(Configu
[static]
```

Represents maximum valid configuration type. This is used internally and you should not need it.

Definition at line 670 of file easylogging++.h.

9.10.3.2 kMinValid

```
const base::type::EnumType el::ConfigurationTypeHelper::kMinValid = static_cast<base::type::EnumType>(Configu
[static]
```

Represents minimum valid configuration type. Useful when iterating through enum.

Definition at line 668 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.11 el::base::debug::CrashHandler Class Reference

```
#include <easylogging++.h>
```

Public Member Functions

- CrashHandler (bool)

9.11.1 Detailed Description

Definition at line 3622 of file easylogging++.h.

9.11.2 Constructor & Destructor Documentation

9.11.2.1 CrashHandler()

```
el::base::debug::CrashHandler::CrashHandler (
            bool  )  [inline], [explicit]
```

Definition at line 3624 of file easylogging++.h.

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

- include/easylogging++.h

9.12 el::CustomFormatSpecifier Class Reference

User-provided custom format specifier.

```
#include <easylogging++.h>
```

Public Member Functions

- CustomFormatSpecifier (const char *formatSpecifier, const FormatSpecifierValueResolver &resolver)
- const char * formatSpecifier (void) const
- const FormatSpecifierValueResolver & resolver (void) const
- bool operator== (const char *formatSpecifier)

Private Attributes

- const char * m_formatSpecifier
- FormatSpecifierValueResolver m_resolver

9.12.1 Detailed Description

User-provided custom format specifier.

See also

el::Helpers::installCustomFormatSpecifier

FormatSpecifierValueResolver

Definition at line 1646 of file easylogging++.h.

9.12.2 Constructor & Destructor Documentation

9.12.2.1 CustomFormatSpecifier()

```
el::CustomFormatSpecifier::CustomFormatSpecifier (
            const char * formatSpecifier,
            const FormatSpecifierValueResolver & resolver )  [inline]
```

Definition at line 1648 of file easylogging++.h.

9.12.3 Member Function Documentation

9.12.3.1 formatSpecifier()

```
const char * el::CustomFormatSpecifier::formatSpecifier (
            void  ) const  [inline]
```

Definition at line 1650 of file easylogging++.h.

9.12.3.2 operator==()

```
bool el::CustomFormatSpecifier::operator== (
            const char * formatSpecifier )  [inline]
```

Definition at line 1656 of file easylogging++.h.

9.12.3.3 resolver()

```
const FormatSpecifierValueResolver & el::CustomFormatSpecifier::resolver (
            void  ) const  [inline]
```

Definition at line 1653 of file easylogging++.h.

9.12.4 Field Documentation

9.12.4.1 m_formatSpecifier

```
const char* el::CustomFormatSpecifier::m_formatSpecifier  [private]
```

Definition at line 1661 of file easylogging++.h.

9.12.4.2 m_resolver

```
FormatSpecifierValueResolver el::CustomFormatSpecifier::m_resolver  [private]
```

Definition at line 1662 of file easylogging++.h.

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

- include/easylogging++.h

9.13 Json::Value::CZString Class Reference

Data Structures

- struct StringStorage

Public Types

- enum DuplicationPolicy { noDuplication = 0 , duplicate , duplicateOnCopy }

Public Member Functions

- CZString (ArrayIndex index)
- CZString (char const *str, unsigned length, DuplicationPolicy allocate)
- CZString (CZString const &other)
- CZString (CZString &&other) noexcept
- ~CZString ()
- CZString & operator= (const CZString &other)
- CZString & operator= (CZString &&other) noexcept
- bool operator< (CZString const &other) const
- bool operator== (CZString const &other) const
- ArrayIndex index () const
- char const * data () const
- unsigned length () const
- bool isStaticString () const

Private Member Functions

- void swap (CZString &other)

Private Attributes

- char const * cstr_
- union {
  ArrayIndex index_
  StringStorage storage_
  };

9.13.1 Detailed Description

Definition at line 265 of file value.h.

9.13.2 Member Enumeration Documentation

9.13.2.1 DuplicationPolicy

```
enum Json::Value::CZString::DuplicationPolicy
```

Enumerator

noDuplication	
duplicate	
duplicateOnCopy	

Definition at line 267 of file value.h.

9.13.3 Constructor & Destructor Documentation

9.13.3.1 CZString() [1/4]

```
Json::Value::CZString::CZString (
            ArrayIndex index )
```

9.13.3.2 CZString() [2/4]

```
Json::Value::CZString::CZString (
            char const * str,
            unsigned length,
            DuplicationPolicy allocate )
```

9.13.3.3 CZString() [3/4]

```
Json::Value::CZString::CZString (
            CZString const & other )
```

9.13.3.4 CZString() [4/4]

```
Json::Value::CZString::CZString (
            CZString && other )  [noexcept]
```

9.13.3.5 ~CZString()

```
Json::Value::CZString::~CZString ( )
```

9.13.4 Member Function Documentation

9.13.4.1 data()

```
char const * Json::Value::CZString::data ( ) const
```

9.13.4.2 index()

```
ArrayIndex Json::Value::CZString::index ( ) const
```

9.13.4.3 isStaticString()

```
bool Json::Value::CZString::isStaticString ( ) const
```

9.13.4.4 length()

```
unsigned Json::Value::CZString::length ( ) const
```

9.13.4.5 operator<()

```
bool Json::Value::CZString::operator< (
            CZString const & other ) const
```

9.13.4.6 operator=() [1/2]

```
CZString & Json::Value::CZString::operator= (
            const CZString & other )
```

9.13.4.7 operator=() [2/2]

```
CZString & Json::Value::CZString::operator= (
            CZString && other )  [noexcept]
```

9.13.4.8 operator==()

```
bool Json::Value::CZString::operator== (
            CZString const & other ) const
```

9.13.4.9 swap()

```
void Json::Value::CZString::swap (
            CZString & other )  [private]
```

9.13.5 Field Documentation

9.13.5.1 [union]

```
union { ... } Json::Value::CZString  [private]
```

9.13.5.2 cstr_

```
char const* Json::Value::CZString::cstr_  [private]
```

Definition at line 292 of file value.h.

9.13.5.3 index_

```
ArrayIndex Json::Value::CZString::index_
```

Definition at line 294 of file value.h.

9.13.5.4 storage_

```
StringStorage Json::Value::CZString::storage_
```

Definition at line 295 of file value.h.

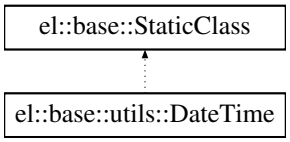
The documentation for this class was generated from the following file:

- include/jsoncpp/value.h

9.14 el::base::utils::DateTime Class Reference

Contains utilities for cross-platform date/time. This class make use of el::base::utils::Str.

Inheritance diagram for el::base::utils::DateTime:



Static Public Member Functions

- static void gettimeofday (struct timeval *tv)

  Cross platform gettimeofday for Windows and unix platform. This can be used to determine current microsecond.
- static std::string getDateTime (const char *format, const base::SubsecondPrecision *ssPrec)

  Gets current date and time with a subsecond part.
- static std::string timevalToString (struct timeval tval, const char *format, const el::base::SubsecondPrecision *ssPrec)

  Converts timeval (struct from ctime) to string using specified format and subsecond precision.
- static base::type::string_t formatTime (unsigned long long time, base::TimestampUnit timestampUnit)

  Formats time to get unit accordingly, units like second if > 1000 or minutes if > 60000 etc.
- static unsigned long long getTimeDifference (const struct timeval &endTime, const struct timeval &startTime, base::TimestampUnit timestampUnit)

  Gets time difference in milli/micro second depending on timestampUnit.
- static struct::tm * buildTimeInfo (struct timeval *currTime, struct ::tm *timeInfo)

Static Private Member Functions

- static char * parseFormat (char *buf, std::size_t bufSz, const char *format, const struct tm *tInfo, std::size_t msec, const base::SubsecondPrecision *ssPrec)

9.14.1 Detailed Description

Contains utilities for cross-platform date/time. This class make use of el::base::utils::Str.

Definition at line 1179 of file easylogging++.h.

9.14.2 Member Function Documentation

9.14.2.1 buildTimeInfo()

```
struct::tm * el::base::utils::DateTime::buildTimeInfo (
             struct timeval * currTime,
             struct ::tm * timeInfo )  [static]
```

Definition at line 1225 of file easylogging++.cc.

References ELPP_UNUSED, elpptime, elpptime_r, and elpptime_s.

9.14.2.2 formatTime()

```
base::type::string_t el::base::utils::DateTime::formatTime (
             unsigned long long time,
             base::TimestampUnit timestampUnit )  [static]
```

Formats time to get unit accordingly, units like second if > 1000 or minutes if > 60000 etc.

Definition at line 1194 of file easylogging++.cc.

References el::base::consts::kTimeFormats, and el::base::consts::kTimeFormatsCount.

9.14.2.3 getDateTime()

```
std::string el::base::utils::DateTime::getDateTime (
             const char * format,
             const base::SubsecondPrecision * ssPrec )  [static]
```

Gets current date and time with a subsecond part.

Parameters

format	User provided date/time format
ssPrec	A pointer to base::SubsecondPrecision from configuration (non-null)

Returns

string based date time in specified format.

Definition at line 1177 of file easylogging++.cc.

References gettimeofday(), and timevalToString().

9.14.2.4 getTimeDifference()

```
unsigned long long el::base::utils::DateTime::getTimeDifference (
            const struct timeval & endTime,
            const struct timeval & startTime,
            base::TimestampUnit timestampUnit )  [static]
```

Gets time difference in milli/micro second depending on timestampUnit.

Definition at line 1212 of file easylogging++.cc.

References el::base::Microsecond.

9.14.2.5 gettimeofday()

```
void el::base::utils::DateTime::gettimeofday (
            struct timeval * tv )  [static]
```

Cross platform gettimeofday for Windows and unix platform. This can be used to determine current microsecond.

@detail For unix system it uses gettimeofday(timeval*, timezone*) and for Windows, a separate implementation is provided

Parameters

in,out	*tv*	Pointer that gets updated

Definition at line 1150 of file easylogging++.cc.

References gettimeofday().

9.14.2.6 parseFormat()

```
char * el::base::utils::DateTime::parseFormat (
            char * buf,
            std::size_t bufSz,
            const char * format,
            const struct tm * tInfo,
            std::size_t msec,
            const base::SubsecondPrecision * ssPrec )  [static], [private]
```

Definition at line 1251 of file easylogging++.cc.

References el::base::utils::Str::addToBuff(), el::base::utils::Str::convertAndAddToBuff(), el::base::consts::kAm, el::base::consts::kDays, el::base::consts::kDaysAbbrev, el::base::consts::kFormatSpecifierChar, el::base::consts::kMonths, el::base::consts::kMonthsAbbrev, el::base::consts::kPm, el::base::consts::kYearBase, and el::base::SubsecondPrecision::m_width.

9.14.2.7 timevalToString()

```
std::string el::base::utils::DateTime::timevalToString (
            struct timeval tval,
            const char * format,
            const el::base::SubsecondPrecision * ssPrec )  [static]
```

Converts timeval (struct from ctime) to string using specified format and subsecond precision.

Definition at line 1183 of file easylogging++.cc.

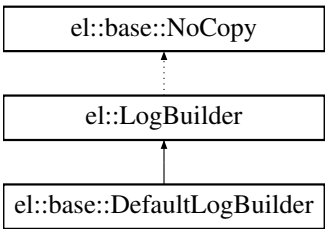
References buildTimeInfo(), el::base::SubsecondPrecision::m_offset, and parseFormat().

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

- include/easylogging++.h
- lib/easylogging++.cc

9.15 el::base::DefaultLogBuilder Class Reference

Inheritance diagram for el::base::DefaultLogBuilder:



Public Member Functions

- base::type::string_t build (const LogMessage *logMessage, bool appendNewLine) const

Public Member Functions inherited from el::LogBuilder

- LogBuilder ()
- virtual ~LogBuilder (void)
- void convertToColoredOutput (base::type::string_t *logLine, Level level)

9.15.1 Detailed Description

Definition at line 2765 of file easylogging++.h.

9.15.2 Member Function Documentation

9.15.2.1 build()

```
base::type::string_t el::base::DefaultLogBuilder::build (
            const LogMessage * logMessage,
            bool appendNewLine ) const  [virtual]
```

Implements el::LogBuilder.

Definition at line 2392 of file easylogging++.cc.

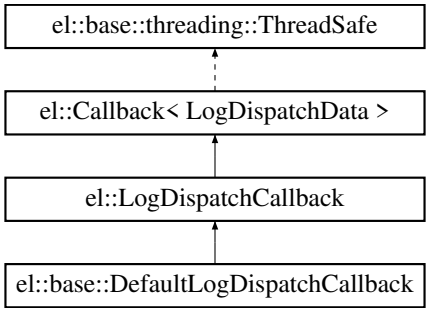
References el::base::utils::Str::addToBuff(), el::base::AppName, el::base::utils::File::buildBaseFilename(), el::base::utils::File::buildStrippedFilename(), el::base::utils::Str::clearBuff(), el::base::utils::Str::convertAndAddToBuff(), el::base::DateTime, el::base::LogFormat::dateTimeFormat(), ELPP, ELPP_LITERAL, ELPP_UNUSED, el::base::File, el::LogMessage::file(), el::base::FileBase, el::base::LogFormat::format(), el::LogMessage::func(), el::base::Function, el::base::threading::getCurrentThreadId(), el::base::utils::DateTime::getDateTime(), el::base::LogFormat::hasFlag(), el::base::consts::kAppNameFormatSpecifier, el::base::consts::kDateTimeFormatSpecifier, el::base::consts::kLogFileBaseFormatSpe el::base::consts::kLogFileFormatSpecifier, el::base::consts::kLogFunctionFormatSpecifier, el::base::consts::kLogLineFormatSpecifier el::base::consts::kLogLocationFormatSpecifier, el::base::consts::kMessageFormatSpecifier, el::base::consts::kSourceFilenameMaxL el::base::consts::kSourceLineMaxLength, el::base::consts::kThreadIdFormatSpecifier, el::base::consts::kVerboseLevelFormatSpecifie el::LogMessage::level(), el::base::Line, el::LogMessage::line(), el::base::Location, el::base::TypedConfigurations::logFormat(), el::LogMessage::logger(), el::base::LogMessage, el::LogMessage::message(), el::Logger::parentApplicationName(), el::base::utils::Str::replaceFirstWithEscape(), el::base::TypedConfigurations::subsecondPrecision(), el::base::ThreadId, el::Logger::typedConfigurations(), el::Verbose, el::base::VerboseLevel, and el::LogMessage::verboseLevel().

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

- include/easylogging++.h
- lib/easylogging++.cc

9.16 el::base::DefaultLogDispatchCallback Class Reference

Inheritance diagram for el::base::DefaultLogDispatchCallback:



Protected Member Functions

- void handle (const LogDispatchData *data)

Protected Member Functions inherited from el::LogDispatchCallback

- base::threading::Mutex & fileHandle (const LogDispatchData *data)

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Private Member Functions

- void dispatch (base::type::string_t &&logLine)

Private Attributes

- const LogDispatchData * m_data

Additional Inherited Members

Public Member Functions inherited from el::Callback< LogDispatchData >

- Callback (void)
- bool enabled (void) const
- void setEnabled (bool enabled)

9.16.1 Detailed Description

Definition at line 2726 of file easylogging++.h.

9.16.2 Member Function Documentation

9.16.2.1 dispatch()

```
void el::base::DefaultLogDispatchCallback::dispatch (
            base::type::string_t && logLine )  [private]
```

Definition at line 2215 of file easylogging++.cc.

References el::ColoredTerminalOutput, el::LogBuilder::convertToColoredOutput(), el::LevelHelper::convertToString(), el::Debug, el::LogDispatchData::dispatchAction(), ELPP, ELPP_COUT, ELPP_COUT_LINE, ELPP_INTERNAL_ERROR, el::Error, el::Fatal, el::base::TypedConfigurations::filename(), el::base::TypedConfigurations::fileStream(), el::Logger::flush(), el::Logger::id(), el::ImmediateFlush, el::Info, el::Logger::isFlushNeeded(), el::LogMessage::level(), el::Logger::logBuilder(), el::LogMessage::logger(), el::LogDispatchData::logMessage(), m_data, el::Logger::m_typedConfigurations, el::base::NormalLog, el::base::SysLog, el::base::TypedConfigurations::toFile(), el::base::TypedConfigurations::toStandardOutput(), el::Warning, and el::base::utils::Str::wcharPtrToCharPtr().

9.16.2.2 handle()

```
void el::base::DefaultLogDispatchCallback::handle (
            const LogDispatchData * data )  [protected], [virtual]
```

Reimplemented from el::LogDispatchCallback.

Definition at line 2205 of file easylogging++.cc.

References el::LogBuilder::build(), dispatch(), el::LogDispatchData::dispatchAction(), el::LogDispatchCallback::fileHandle(), el::LogDispatchCallback::handle(), el::Logger::logBuilder(), el::LogMessage::logger(), el::LogDispatchData::logMessage(), m_data, and el::base::NormalLog.

9.16.3 Field Documentation

9.16.3.1 m_data

```
const LogDispatchData* el::base::DefaultLogDispatchCallback::m_data  [private]
```

Definition at line 2730 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.17 Json::Reader::ErrorInfo Class Reference

Data Fields

- Token token_
- String message_
- Location extra_

9.17.1 Detailed Description

Definition at line 183 of file reader.h.

9.17.2 Field Documentation

9.17.2.1 extra_

```
Location Json::Reader::ErrorInfo::extra_
```

Definition at line 187 of file reader.h.

9.17.2.2 message_

```
String Json::Reader::ErrorInfo::message_
```

Definition at line 186 of file reader.h.

9.17.2.3 token_

```
Token Json::Reader::ErrorInfo::token_
```

Definition at line 185 of file reader.h.

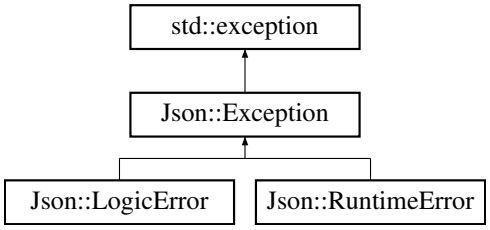
The documentation for this class was generated from the following file:

- include/jsoncpp/reader.h

9.18 Json::Exception Class Reference

```
#include <value.h>
```

Inheritance diagram for Json::Exception:



Public Member Functions

- Exception (String msg)
- ~Exception () noexcept override
- char const * what () const noexcept override

Protected Attributes

- String msg_

9.18.1 Detailed Description

Base class for all exceptions we throw.

We use nothing but these internally. Of course, STL can throw others.

Definition at line 68 of file value.h.

9.18.2 Constructor & Destructor Documentation

9.18.2.1 Exception()

```
Json::Exception::Exception (
            String msg )
```

9.18.2.2 ~Exception()

```
Json::Exception::~Exception ( )  [override], [noexcept]
```

9.18.3 Member Function Documentation

9.18.3.1 what()

```
char const * Json::Exception::what ( ) const  [override], [noexcept]
```

9.18.4 Field Documentation

9.18.4.1 msg_

```
String Json::Exception::msg_  [protected]
```

Definition at line 75 of file value.h.

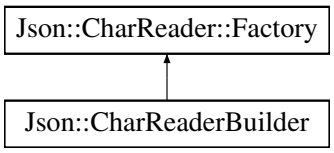
The documentation for this class was generated from the following file:

- include/jsoncpp/value.h

9.19 Json::CharReader::Factory Class Reference

```
#include <reader.h>
```

Inheritance diagram for Json::CharReader::Factory:



Public Member Functions

- virtual ~Factory ()=default
- virtual CharReader * newCharReader () const =0

  Allocate a CharReader via operator new().

9.19.1 Detailed Description

Definition at line 267 of file reader.h.

9.19.2 Constructor & Destructor Documentation

9.19.2.1 ~Factory()

```
virtual Json::CharReader::Factory::~Factory ( )  [virtual], [default]
```

9.19.3 Member Function Documentation

9.19.3.1 newCharReader()

```
virtual CharReader * Json::CharReader::Factory::newCharReader ( ) const  [pure virtual]
```

Allocate a CharReader via operator new().

Exceptions

std::exception	if something goes wrong (e.g. invalid settings)

Implemented in Json::CharReaderBuilder.

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

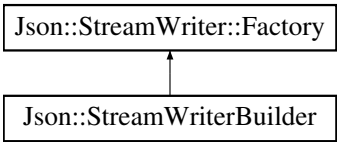
- include/jsoncpp/reader.h

9.20 Json::StreamWriter::Factory Class Reference

A simple abstract factory.

```
#include <writer.h>
```

Inheritance diagram for Json::StreamWriter::Factory:



Public Member Functions

- virtual ~Factory ()
- virtual StreamWriter * newStreamWriter () const =0

  Allocate a CharReader via operator new().

9.20.1 Detailed Description

A simple abstract factory.

Definition at line 59 of file writer.h.

9.20.2 Constructor & Destructor Documentation

9.20.2.1 ~Factory()

```
virtual Json::StreamWriter::Factory::~Factory ( )  [virtual]
```

9.20.3 Member Function Documentation

9.20.3.1 newStreamWriter()

```
virtual StreamWriter * Json::StreamWriter::Factory::newStreamWriter ( ) const  [pure virtual]
```

Allocate a CharReader via operator new().

Exceptions

std::exception	if something goes wrong (e.g. invalid settings)

Implemented in Json::StreamWriterBuilder.

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

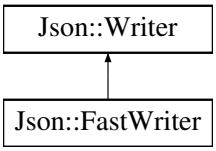
- include/jsoncpp/writer.h

9.21 Json::FastWriter Class Reference

Outputs a Value in JSON format without formatting (not human friendly).

```
#include <writer.h>
```

Inheritance diagram for Json::FastWriter:



Public Member Functions

- FastWriter ()
- ~FastWriter () override=default
- void enableYAMLCompatibility ()
- void dropNullPlaceholders ()

  Drop the "null" string from the writer's output for nullValues. Strictly speaking, this is not valid JSON. But when the output is being fed to a browser's JavaScript, it makes for smaller output and the browser can handle the output just fine.
- void omitEndingLineFeed ()
- String write (const Value &root) override

Public Member Functions inherited from Json::Writer

- virtual ~Writer ()

Private Member Functions

- void writeValue (const Value &value)

Private Attributes

- String document_
- bool yamlCompatibilityEnabled_ {false}
- bool dropNullPlaceholders_ {false}
- bool omitEndingLineFeed_ {false}

9.21.1 Detailed Description

Outputs a Value in JSON format without formatting (not human friendly).

The JSON document is written in a single line. It is not intended for 'human' consumption, but may be useful to support feature such as RPC where bandwidth is limited.

See also

Reader, Value

Deprecated Use StreamWriterBuilder.

Definition at line 171 of file writer.h.

9.21.2 Constructor & Destructor Documentation

9.21.2.1 FastWriter()

```
Json::FastWriter::FastWriter ( )
```

9.21.2.2 ~FastWriter()

```
Json::FastWriter::~FastWriter ( )  [override], [default]
```

9.21.3 Member Function Documentation

9.21.3.1 dropNullPlaceholders()

```
void Json::FastWriter::dropNullPlaceholders ( )
```

Drop the "null" string from the writer's output for nullValues. Strictly speaking, this is not valid JSON. But when the output is being fed to a browser's JavaScript, it makes for smaller output and the browser can handle the output just fine.

9.21.3.2 enableYAMLCompatibility()

```
void Json::FastWriter::enableYAMLCompatibility ( )
```

9.21.3.3 omitEndingLineFeed()

```
void Json::FastWriter::omitEndingLineFeed ( )
```

9.21.3.4 write()

```
String Json::FastWriter::write (
            const Value & root )  [override], [virtual]
```

Implements Json::Writer.

9.21.3.5 writeValue()

```
void Json::FastWriter::writeValue (
            const Value & value )  [private]
```

9.21.4 Field Documentation

9.21.4.1 document_

```
String Json::FastWriter::document_  [private]
```

Definition at line 194 of file writer.h.

9.21.4.2 dropNullPlaceholders_

```
bool Json::FastWriter::dropNullPlaceholders_ {false}  [private]
```

Definition at line 196 of file writer.h.

9.21.4.3 omitEndingLineFeed_

```
bool Json::FastWriter::omitEndingLineFeed_ {false}  [private]
```

Definition at line 197 of file writer.h.

9.21.4.4 yamlCompatibilityEnabled_

```
bool Json::FastWriter::yamlCompatibilityEnabled_ {false}  [private]
```

Definition at line 195 of file writer.h.

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

- include/jsoncpp/writer.h

9.22 Json::Features Class Reference

Configuration passed to reader and writer. This configuration object can be used to force the Reader or Writer to behave in a standard conforming way.

```
#include <json_features.h>
```

Public Member Functions

- Features ()
  Initialize the configuration like JsonConfig::allFeatures;.

Static Public Member Functions

- static Features all ()
  A configuration that allows all features and assumes all strings are UTF-8.
- static Features strictMode ()
  A configuration that is strictly compatible with the JSON specification.

Data Fields

- bool allowComments_ {true}
  `true` *if comments are allowed. Default:* `true`*.*
- bool strictRoot_ {false}
- bool allowDroppedNullPlaceholders_ {false}
  `true` *if dropped null placeholders are allowed. Default:* `false`*.*
- bool allowNumericKeys_ {false}
  `true` *if numeric object key are allowed. Default:* `false`*.*

9.22.1 Detailed Description

Configuration passed to reader and writer. This configuration object can be used to force the Reader or Writer to behave in a standard conforming way.

Definition at line 22 of file json_features.h.

9.22.2 Constructor & Destructor Documentation

9.22.2.1 Features()

```
Json::Features::Features ( )
```

Initialize the configuration like JsonConfig::allFeatures;.

9.22.3 Member Function Documentation

9.22.3.1 all()

```
static Features Json::Features::all ( )  [static]
```

A configuration that allows all features and assumes all strings are UTF-8.

- C & C++ comments are allowed
- Root object can be any JSON value
- Assumes Value strings are encoded in UTF-8

9.22.3.2 strictMode()

```
static Features Json::Features::strictMode ( )  [static]
```

A configuration that is strictly compatible with the JSON specification.

- Comments are forbidden.
- Root object must be either an array or an object value.
- Assumes Value strings are encoded in UTF-8

9.22.4 Field Documentation

9.22.4.1 allowComments_

```
bool Json::Features::allowComments_ {true}
```

`true` if comments are allowed. Default: `true`.

Definition at line 45 of file json_features.h.

9.22.4.2 allowDroppedNullPlaceholders_

```
bool Json::Features::allowDroppedNullPlaceholders_ {false}
```

`true` if dropped null placeholders are allowed. Default: `false`.

Definition at line 52 of file json_features.h.

9.22.4.3 allowNumericKeys_

```
bool Json::Features::allowNumericKeys_ {false}
```

`true` if numeric object key are allowed. Default: `false`.

Definition at line 55 of file json_features.h.

9.22.4.4 strictRoot_

```
bool Json::Features::strictRoot_ {false}
```

`true` if root must be either an array or an object value. Default: `false`.

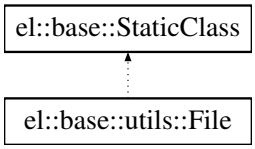
Definition at line 49 of file json_features.h.

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

- include/jsoncpp/json_features.h

9.23 el::base::utils::File Class Reference

Inheritance diagram for el::base::utils::File:



Static Public Member Functions

- static base::type::fstream_t * newFileStream (const std::string &filename)
  Creates new out file stream for specified filename.
- static std::size_t getSizeOfFile (base::type::fstream_t *fs)
  Gets size of file provided in stream.
- static bool pathExists (const char *path, bool considerFile=false)
  Determines whether or not provided path exist in current file system.
- static bool createPath (const std::string &path)
  Creates specified path on file system.
- static std::string extractPathFromFilename (const std::string &fullPath, const char *separator=base::consts::kFilePathSeparator)
  Extracts path of filename with leading slash.
- static void buildStrippedFilename (const char *filename, char buff[ ], std::size_t limit=base::consts::kSourceFilenameMaxLength
  builds stripped filename and puts it in buff
- static void buildBaseFilename (const std::string &fullPath, char buff[ ], std::size_t limit=base::consts::kSourceFilenameMaxLengt
  const char *separator=base::consts::kFilePathSeparator)
  builds base filename and puts it in buff

9.23.1 Detailed Description

Definition at line 1039 of file easylogging++.h.

9.23.2 Member Function Documentation

9.23.2.1 buildBaseFilename()

```
void el::base::utils::File::buildBaseFilename (
            const std::string & fullPath,
            char buff[],
            std::size_t limit = base::consts::kSourceFilenameMaxLength,
            const char * separator = base::consts::kFilePathSeparator )  [static]
```

builds base filename and puts it in buff

Definition at line 841 of file easylogging++.cc.

References STRCAT.

9.23.2.2 buildStrippedFilename()

```
void el::base::utils::File::buildStrippedFilename (
            const char * filename,
            char buff[],
            std::size_t limit = base::consts::kSourceFilenameMaxLength )  [static]
```

builds stripped filename and puts it in buff

Definition at line 829 of file easylogging++.cc.

References STRCAT.

9.23.2.3 createPath()

```
bool el::base::utils::File::createPath (
            const std::string & path )  [static]
```

Creates specified path on file system.

Parameters

path	Path to create.

Definition at line 778 of file easylogging++.cc.

References ELPP_INTERNAL_ERROR, ELPP_UNUSED, el::base::consts::kFilePathSeparator, pathExists(), and STRTOK.

9.23.2.4 extractPathFromFilename()

```
std::string el::base::utils::File::extractPathFromFilename (
            const std::string & fullPath,
            const char * separator = base::consts::kFilePathSeparator )  [static]
```

Extracts path of filename with leading slash.

Definition at line 818 of file easylogging++.cc.

9.23.2.5 getSizeOfFile()

```
std::size_t el::base::utils::File::getSizeOfFile (
            base::type::fstream_t * fs )  [static]
```

Gets size of file provided in stream.

Definition at line 751 of file easylogging++.cc.

9.23.2.6 newFileStream()

```
base::type::fstream_t * el::base::utils::File::newFileStream (
            const std::string & filename )  [static]
```

Creates new out file stream for specified filename.

Returns

Pointer to newly created fstream or nullptr

Definition at line 727 of file easylogging++.cc.

References ELPP_INTERNAL_ERROR, and el::base::utils::safeDelete().

9.23.2.7 pathExists()

```
bool el::base::utils::File::pathExists (
            const char * path,
            bool considerFile = false )  [static]
```

Determines whether or not provided path exist in current file system.

Definition at line 761 of file easylogging++.cc.

References ELPP_UNUSED.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.24 std::hash< el::Level > Struct Reference

`#include <easylogging++.h>`

Public Member Functions

- std::size_t operator() (const el::Level &l) const

9.24.1 Detailed Description

Definition at line 595 of file easylogging++.h.

9.24.2 Member Function Documentation

9.24.2.1 operator()()

```
std::size_t std::hash< el::Level >::operator() (
            const el::Level & l ) const  [inline]
```

Definition at line 597 of file easylogging++.h.

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

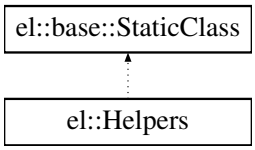
- include/easylogging++.h

9.25 el::Helpers Class Reference

Static helpers for developers.

`#include <easylogging++.h>`

Inheritance diagram for el::Helpers:



Static Public Member Functions

- static void setStorage (base::type::StoragePointer storage)

  Shares logging repository (base::Storage)
- static base::type::StoragePointer storage ()
- static void setArgs (int argc, char **argv)

  Sets application arguments and figures out whats active for logging and whats not.
- static void setArgs (int argc, const char **argv)

  Sets application arguments and figures out whats active for logging and whats not.
- static void setThreadName (const std::string &name)

  Sets thread name for current thread. Requires std::thread.
- static std::string getThreadName ()
- static void installPreRollOutCallback (const PreRollOutCallback &callback)

  Installs pre rollout callback, this callback is triggered when log file is about to be rolled out (can be useful for backing up)
- static void uninstallPreRollOutCallback (void)

  Uninstalls pre rollout callback.
- template<typename T >
  static bool installLogDispatchCallback (const std::string &id)

  Installs post log dispatch callback, this callback is triggered when log is dispatched.
- template<typename T >
  static void uninstallLogDispatchCallback (const std::string &id)

  Uninstalls log dispatch callback.
- template<typename T >
  static T * logDispatchCallback (const std::string &id)
- template<typename T >
  static std::string convertTemplateToStdString (const T &templ)

  Converts template to std::string - useful for loggable classes to log containers within log(std::ostream&) const.
- static const el::base::utils::CommandLineArgs * commandLineArgs (void)

  Returns command line arguments (pointer) provided to easylogging++.
- static void reserveCustomFormatSpecifiers (std::size_t size)

  Reserve space for custom format specifiers for performance.
- static void installCustomFormatSpecifier (const CustomFormatSpecifier &customFormatSpecifier)

  Installs user defined format specifier and handler.
- static bool uninstallCustomFormatSpecifier (const char *formatSpecifier)

  Uninstalls user defined format specifier and handler.
- static bool hasCustomFormatSpecifier (const char *formatSpecifier)

  Returns true if custom format specifier is installed.
- static void validateFileRolling (Logger *logger, Level level)

9.25.1 Detailed Description

Static helpers for developers.

Definition at line 3653 of file easylogging++.h.

9.25.2 Member Function Documentation

9.25.2.1 commandLineArgs()

```
static const el::base::utils::CommandLineArgs * el::Helpers::commandLineArgs (
            void  )  [inline], [static]
```

Returns command line arguments (pointer) provided to easylogging++.

Definition at line 3757 of file easylogging++.h.

References ELPP.

9.25.2.2 convertTemplateToStdString()

```
template<typename T >
static std::string el::Helpers::convertTemplateToStdString (
            const T & templ )  [inline], [static]
```

Converts template to std::string - useful for loggable classes to log containers within log(std::ostream&) const.

Definition at line 3737 of file easylogging++.h.

References el::base::threading::ThreadSafe::acquireLock(), ELPP, ELPP_LITERAL, el::base::MessageBuilder::initialize(), el::base::consts::kDefaultLoggerId, el::base::threading::ThreadSafe::releaseLock(), and el::Logger::stream().

9.25.2.3 getThreadName()

```
static std::string el::Helpers::getThreadName ( )  [inline], [static]
```

Definition at line 3675 of file easylogging++.h.

References ELPP.

9.25.2.4 hasCustomFormatSpecifier()

```
static bool el::Helpers::hasCustomFormatSpecifier (
            const char * formatSpecifier )  [inline], [static]
```

Returns true if custom format specifier is installed.

Definition at line 3774 of file easylogging++.h.

References ELPP.

9.25.2.5 installCustomFormatSpecifier()

```
static void el::Helpers::installCustomFormatSpecifier (
            const CustomFormatSpecifier & customFormatSpecifier )  [inline], [static]
```

Installs user defined format specifier and handler.

Definition at line 3766 of file easylogging++.h.

References ELPP.

9.25.2.6 installLogDispatchCallback()

```
template<typename T >
static bool el::Helpers::installLogDispatchCallback (
            const std::string & id )  [inline], [static]
```

Installs post log dispatch callback, this callback is triggered when log is dispatched.

Definition at line 3707 of file easylogging++.h.

References ELPP.

9.25.2.7 installPreRollOutCallback()

```
static void el::Helpers::installPreRollOutCallback (
            const PreRollOutCallback & callback )  [inline], [static]
```

Installs pre rollout callback, this callback is triggered when log file is about to be rolled out (can be useful for backing up)

Definition at line 3698 of file easylogging++.h.

9.25.2.8 logDispatchCallback()

```
template<typename T >
static T * el::Helpers::logDispatchCallback (
            const std::string & id )  [inline], [static]
```

Definition at line 3716 of file easylogging++.h.

References ELPP.

9.25.2.9 reserveCustomFormatSpecifiers()

```
static void el::Helpers::reserveCustomFormatSpecifiers (
            std::size_t size )  [inline], [static]
```

Reserve space for custom format specifiers for performance.

See also

std::vector::reserve

Definition at line 3762 of file easylogging++.h.

References ELPP.

9.25.2.10 setArgs() [1/2]

```
static void el::Helpers::setArgs (
             int argc,
             char ** argv )  [inline], [static]
```

Sets application arguments and figures out whats active for logging and whats not.

Definition at line 3664 of file easylogging++.h.

References ELPP.

9.25.2.11 setArgs() [2/2]

```
static void el::Helpers::setArgs (
             int argc,
             const char ** argv )  [inline], [static]
```

Sets application arguments and figures out whats active for logging and whats not.

Definition at line 3668 of file easylogging++.h.

References ELPP.

9.25.2.12 setStorage()

```
static void el::Helpers::setStorage (
             base::type::StoragePointer storage )  [inline], [static]
```

Shares logging repository (base::Storage)

Definition at line 3656 of file easylogging++.h.

References ELPP.

9.25.2.13 setThreadName()

```
static void el::Helpers::setThreadName (
             const std::string & name )  [inline], [static]
```

Sets thread name for current thread. Requires std::thread.

Definition at line 3672 of file easylogging++.h.

References ELPP.

9.25.2.14 storage()

```
static base::type::StoragePointer el::Helpers::storage ( )  [inline], [static]
```

Returns

Main storage repository

Definition at line 3660 of file easylogging++.h.

References ELPP.

9.25.2.15 uninstallCustomFormatSpecifier()

```
static bool el::Helpers::uninstallCustomFormatSpecifier (
             const char * formatSpecifier )  [inline], [static]
```

Uninstalls user defined format specifier and handler.

Definition at line 3770 of file easylogging++.h.

References ELPP.

9.25.2.16 uninstallLogDispatchCallback()

```
template<typename T >
static void el::Helpers::uninstallLogDispatchCallback (
             const std::string & id )  [inline], [static]
```

Uninstalls log dispatch callback.

Definition at line 3712 of file easylogging++.h.

References ELPP.

9.25.2.17 uninstallPreRollOutCallback()

```
static void el::Helpers::uninstallPreRollOutCallback (
             void  )  [inline], [static]
```

Uninstalls pre rollout callback.

Definition at line 3702 of file easylogging++.h.

References ELPP.

9.25.2.18 validateFileRolling()

```
static void el::Helpers::validateFileRolling (
             Logger * logger,
             Level level )  [inline], [static]
```

Definition at line 3777 of file easylogging++.h.

References ELPP, el::Logger::m_typedConfigurations, and el::base::TypedConfigurations::validateFileRolling().

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

- include/easylogging++.h

9.26 el::base::HitCounter Class Reference

Class that keeps record of current line hit for occasional logging.

Data Structures

- class Predicate

Public Member Functions

- HitCounter (void)
- HitCounter (const char *filename, base::type::LineNumber lineNumber)
- HitCounter (const HitCounter &hitCounter)
- HitCounter & operator= (const HitCounter &hitCounter)
- virtual ~HitCounter (void)
- void resetLocation (const char *filename, base::type::LineNumber lineNumber)

  Resets location of current hit counter.
- void validateHitCounts (std::size_t n)

  Validates hit counts and resets it if necessary.
- const char * filename (void) const
- base::type::LineNumber lineNumber (void) const
- std::size_t hitCounts (void) const
- void increment (void)

Private Attributes

- const char * m_filename
- base::type::LineNumber m_lineNumber
- std::size_t m_hitCounts

9.26.1 Detailed Description

Class that keeps record of current line hit for occasional logging.

Definition at line 2033 of file easylogging++.h.

9.26.2 Constructor & Destructor Documentation

9.26.2.1 HitCounter() [1/3]

```
el::base::HitCounter::HitCounter (
            void  )  [inline]
```

Definition at line 2035 of file easylogging++.h.

9.26.2.2 HitCounter() [2/3]

```
el::base::HitCounter::HitCounter (
            const char * filename,
            base::type::LineNumber lineNumber )  [inline]
```

Definition at line 2041 of file easylogging++.h.

9.26.2.3 HitCounter() [3/3]

```
el::base::HitCounter::HitCounter (
            const HitCounter & hitCounter )  [inline]
```

Definition at line 2047 of file easylogging++.h.

9.26.2.4 ~HitCounter()

```
virtual el::base::HitCounter::~HitCounter (
            void  )  [inline], [virtual]
```

Definition at line 2062 of file easylogging++.h.

9.26.3 Member Function Documentation

9.26.3.1 filename()

```
const char * el::base::HitCounter::filename (
            void  ) const  [inline]
```

Definition at line 2079 of file easylogging++.h.

9.26.3.2 hitCounts()

```
std::size_t el::base::HitCounter::hitCounts (
            void  ) const  [inline]
```

Definition at line 2087 of file easylogging++.h.

9.26.3.3 increment()

```
void el::base::HitCounter::increment (
            void  )  [inline]
```

Definition at line 2091 of file easylogging++.h.

9.26.3.4 lineNumber()

```
base::type::LineNumber el::base::HitCounter::lineNumber (
            void  ) const  [inline]
```

Definition at line 2083 of file easylogging++.h.

9.26.3.5 operator=()

```
HitCounter & el::base::HitCounter::operator= (
            const HitCounter & hitCounter )  [inline]
```

Definition at line 2053 of file easylogging++.h.

References m_filename, m_hitCounts, and m_lineNumber.

9.26.3.6 resetLocation()

```
void el::base::HitCounter::resetLocation (
            const char * filename,
            base::type::LineNumber lineNumber )  [inline]
```

Resets location of current hit counter.

Definition at line 2066 of file easylogging++.h.

9.26.3.7 validateHitCounts()

```
void el::base::HitCounter::validateHitCounts (
            std::size_t n )  [inline]
```

Validates hit counts and resets it if necessary.

Definition at line 2072 of file easylogging++.h.

9.26.4 Field Documentation

9.26.4.1 m_filename

```
const char* el::base::HitCounter::m_filename  [private]
```

Definition at line 2113 of file easylogging++.h.

9.26.4.2 m_hitCounts

```
std::size_t el::base::HitCounter::m_hitCounts  [private]
```

Definition at line 2115 of file easylogging++.h.

9.26.4.3 m_lineNumber

```
base::type::LineNumber el::base::HitCounter::m_lineNumber  [private]
```

Definition at line 2114 of file easylogging++.h.

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

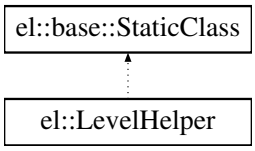
- include/easylogging++.h

9.27 el::LevelHelper Class Reference

Static class that contains helper functions for el::Level.

```
#include <easylogging++.h>
```

Inheritance diagram for el::LevelHelper:



Static Public Member Functions

- static base::type::EnumType castToInt (Level level)
  Casts level to int, useful for iterating through enum.
- static Level castFromInt (base::type::EnumType l)
  Casts int(ushort) to level, useful for iterating through enum.
- static const char * convertToString (Level level)
  Converts level to associated const char.*
- static Level convertFromString (const char *levelStr)
  Converts from levelStr to Level.
- static void forEachLevel (base::type::EnumType *startIndex, const std::function< bool(void)> &fn)
  Applies specified function to each level starting from startIndex.

Static Public Attributes

- static const base::type::EnumType kMinValid = static_cast<base::type::EnumType>(Level::Trace)
  Represents minimum valid level. Useful when iterating through enum.
- static const base::type::EnumType kMaxValid = static_cast<base::type::EnumType>(Level::Info)
  Represents maximum valid level. This is used internally and you should not need it.

9.27.1 Detailed Description

Static class that contains helper functions for el::Level.

Definition at line 604 of file easylogging++.h.

9.27.2 Member Function Documentation

9.27.2.1 castFromInt()

```
static Level el::LevelHelper::castFromInt (
            base::type::EnumType l )  [inline], [static]
```

Casts int(ushort) to level, useful for iterating through enum.

Definition at line 615 of file easylogging++.h.

9.27.2.2 castToInt()

```
static base::type::EnumType el::LevelHelper::castToInt (
            Level level )  [inline], [static]
```

Casts level to int, useful for iterating through enum.

Definition at line 611 of file easylogging++.h.

9.27.2.3 convertFromString()

```
Level el::LevelHelper::convertFromString (
            const char * levelStr )  [static]
```

Converts from levelStr to Level.

Parameters

levelStr	Upper case string based level. Lower case is also valid but providing upper case is recommended.

Definition at line 161 of file easylogging++.cc.

References el::base::utils::Str::cStringCaseEq(), el::StringToLevelItem::level, el::stringToLevelMap, and el::Unknown.

9.27.2.4 convertToString()

```
const char * el::LevelHelper::convertToString (
            Level level )  [static]
```

Converts level to associated const char*.

Returns

Upper case string based level.

Definition at line 132 of file easylogging++.cc.

References el::Debug, el::Error, el::Fatal, el::Global, el::Info, el::Trace, el::Verbose, and el::Warning.

9.27.2.5 forEachLevel()

```
void el::LevelHelper::forEachLevel (
            base::type::EnumType * startIndex,
            const std::function< bool(void)> & fn )  [static]
```

Applies specified function to each level starting from startIndex.

Parameters

startIndex	initial value to start the iteration from. This is passed as pointer and is left-shifted so this can be used inside function (fn) to represent current level.
fn	function to apply with each level. This bool represent whether or not to stop iterating through levels.

Definition at line 170 of file easylogging++.cc.

References kMaxValid.

9.27.3 Field Documentation

9.27.3.1 kMaxValid

```
const base::type::EnumType el::LevelHelper::kMaxValid = static_cast<base::type::EnumType>(Level::Info)
[static]
```

Represents maximum valid level. This is used internally and you should not need it.

Definition at line 609 of file easylogging++.h.

9.27.3.2 kMinValid

```
const base::type::EnumType el::LevelHelper::kMinValid = static_cast<base::type::EnumType>(Level::Trace)
[static]
```

Represents minimum valid level. Useful when iterating through enum.

Definition at line 607 of file easylogging++.h.

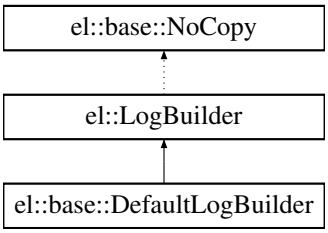
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.28 el::LogBuilder Class Reference

`#include <easylogging++.h>`

Inheritance diagram for el::LogBuilder:



Public Member Functions

- LogBuilder ()
- virtual ~LogBuilder (void)
- virtual base::type::string_t build (const LogMessage *logMessage, bool appendNewLine) const =0
- void convertToColoredOutput (base::type::string_t *logLine, Level level)

Private Attributes

- bool m_termSupportsColor

Friends

- class el::base::DefaultLogDispatchCallback

Additional Inherited Members

Private Member Functions inherited from el::base::NoCopy

- NoCopy (void)

9.28.1 Detailed Description

Definition at line 2197 of file easylogging++.h.

9.28.2 Constructor & Destructor Documentation

9.28.2.1 LogBuilder()

`el::LogBuilder::LogBuilder ( )  [inline]`

Definition at line 2199 of file easylogging++.h.

9.28.2.2 ~LogBuilder()

```
virtual el::LogBuilder::~LogBuilder (
            void  )  [inline], [virtual]
```

Definition at line 2200 of file easylogging++.h.

References ELPP_INTERNAL_INFO.

9.28.3 Member Function Documentation

9.28.3.1 build()

```
virtual base::type::string_t el::LogBuilder::build (
            const LogMessage * logMessage,
            bool appendNewLine ) const  [pure virtual]
```

Implemented in el::base::DefaultLogBuilder.

9.28.3.2 convertToColoredOutput()

```
void el::LogBuilder::convertToColoredOutput (
            base::type::string_t * logLine,
            Level level )
```

Definition at line 581 of file easylogging++.cc.

References el::Debug, ELPP_LITERAL, el::Error, el::Fatal, el::Info, el::Trace, and el::Warning.

9.28.4 Friends And Related Symbol Documentation

9.28.4.1 el::base::DefaultLogDispatchCallback

```
friend class el::base::DefaultLogDispatchCallback  [friend]
```

Definition at line 2207 of file easylogging++.h.

9.28.5 Field Documentation

9.28.5.1 m_termSupportsColor

```
bool el::LogBuilder::m_termSupportsColor  [private]
```

Definition at line 2206 of file easylogging++.h.

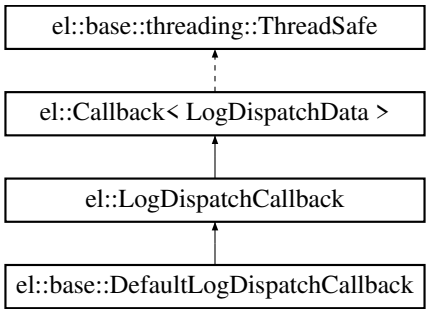
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.29 el::LogDispatchCallback Class Reference

`#include <easylogging++.h>`

Inheritance diagram for el::LogDispatchCallback:



Protected Member Functions

- virtual void handle (const LogDispatchData *data)
- base::threading::Mutex & fileHandle (const LogDispatchData *data)

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Private Attributes

- std::unordered_map< std::string, std::unique_ptr< base::threading::Mutex > > m_fileLocks
- base::threading::Mutex m_fileLocksMapLock

Friends

- class base::LogDispatcher

Additional Inherited Members

Public Member Functions inherited from el::Callback< LogDispatchData >

- Callback (void)
- bool enabled (void) const
- void setEnabled (bool enabled)

9.29.1 Detailed Description

Definition at line 2180 of file easylogging++.h.

9.29.2 Member Function Documentation

9.29.2.1 fileHandle()

```
base::threading::Mutex & el::LogDispatchCallback::fileHandle (
            const LogDispatchData * data )  [protected]
```

Definition at line 2197 of file easylogging++.cc.

References el::base::TypedConfigurations::filename(), el::LogMessage::level(), el::LogMessage::logger(), el::LogDispatchData::logMessage(), m_fileLocks, and el::Logger::typedConfigurations().

9.29.2.2 handle()

```
void el::LogDispatchCallback::handle (
            const LogDispatchData * data )  [protected], [virtual]
```

Implements el::Callback< LogDispatchData >.

Reimplemented in el::base::DefaultLogDispatchCallback.

Definition at line 2194 of file easylogging++.cc.

9.29.3 Friends And Related Symbol Documentation

9.29.3.1 base::LogDispatcher

```
friend class base::LogDispatcher  [friend]
```

Definition at line 2185 of file easylogging++.h.

9.29.4 Field Documentation

9.29.4.1 m_fileLocks

```
std::unordered_map<std::string, std::unique_ptr<base::threading::Mutex> > el::LogDispatch↩
Callback::m_fileLocks  [private]
```

Definition at line 2186 of file easylogging++.h.

9.29.4.2 m_fileLocksMapLock

```
base::threading::Mutex el::LogDispatchCallback::m_fileLocksMapLock  [private]
```

Definition at line 2187 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.30 el::LogDispatchData Class Reference

```
#include <easylogging++.h>
```

Public Member Functions

- LogDispatchData ()
- const LogMessage * logMessage (void) const
- base::DispatchAction dispatchAction (void) const
- void setLogMessage (LogMessage *logMessage)
- void setDispatchAction (base::DispatchAction dispatchAction)

Private Attributes

- LogMessage * m_logMessage
- base::DispatchAction m_dispatchAction

Friends

- class base::LogDispatcher

9.30.1 Detailed Description

Definition at line 2159 of file easylogging++.h.

9.30.2 Constructor & Destructor Documentation

9.30.2.1 LogDispatchData()

```
el::LogDispatchData::LogDispatchData ( )  [inline]
```

Definition at line 2161 of file easylogging++.h.

9.30.3 Member Function Documentation

9.30.3.1 dispatchAction()

```
base::DispatchAction el::LogDispatchData::dispatchAction (
            void  ) const  [inline]
```

Definition at line 2165 of file easylogging++.h.

9.30.3.2 logMessage()

```
const LogMessage * el::LogDispatchData::logMessage (
            void  ) const  [inline]
```

Definition at line 2162 of file easylogging++.h.

9.30.3.3 setDispatchAction()

```
void el::LogDispatchData::setDispatchAction (
            base::DispatchAction dispatchAction )  [inline]
```

Definition at line 2171 of file easylogging++.h.

9.30.3.4 setLogMessage()

```
void el::LogDispatchData::setLogMessage (
            LogMessage * logMessage )  [inline]
```

Definition at line 2168 of file easylogging++.h.

9.30.4 Friends And Related Symbol Documentation

9.30.4.1 base::LogDispatcher

```
friend class base::LogDispatcher  [friend]
```

Definition at line 2177 of file easylogging++.h.

9.30.5 Field Documentation

9.30.5.1 m_dispatchAction

```
base::DispatchAction el::LogDispatchData::m_dispatchAction  [private]
```

Definition at line 2176 of file easylogging++.h.

9.30.5.2 m_logMessage

```
LogMessage* el::LogDispatchData::m_logMessage  [private]
```

Definition at line 2175 of file easylogging++.h.

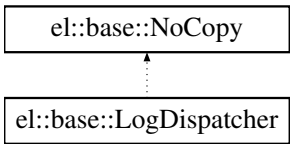
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.31 el::base::LogDispatcher Class Reference

Dispatches log messages.

Inheritance diagram for el::base::LogDispatcher:



Public Member Functions

- LogDispatcher (bool proceed, LogMessage *logMessage, base::DispatchAction dispatchAction)
- void dispatch (void)

Private Attributes

- bool m_proceed
- LogMessage * m_logMessage
- base::DispatchAction m_dispatchAction

Additional Inherited Members

Private Member Functions inherited from el::base::NoCopy

- NoCopy (void)

9.31.1 Detailed Description

Dispatches log messages.

Definition at line 2770 of file easylogging++.h.

9.31.2 Constructor & Destructor Documentation

9.31.2.1 LogDispatcher()

```
el::base::LogDispatcher::LogDispatcher (
            bool proceed,
            LogMessage * logMessage,
            base::DispatchAction dispatchAction )  [inline]
```

Definition at line 2772 of file easylogging++.h.

9.31.3 Member Function Documentation

9.31.3.1 dispatch()

```
void el::base::LogDispatcher::dispatch (
            void  )
```

Definition at line 2473 of file easylogging++.cc.

References ELPP, el::Callback< T >::enabled(), el::LogDispatchCallback::handle(), el::LogMessage::level(), el::LogMessage::logger(), m_dispatchAction, m_logMessage, m_proceed, el::Logger::m_typedConfigurations, el::base::None, el::LogDispatchData::setDispatchAction(), el::LogDispatchData::setLogMessage(), el::StrictLogFileSizeCheck, and el::base::TypedConfigurations::validateFileRolling().

9.31.4 Field Documentation

9.31.4.1 m_dispatchAction

```
base::DispatchAction el::base::LogDispatcher::m_dispatchAction  [private]
```

Definition at line 2783 of file easylogging++.h.

9.31.4.2 m_logMessage

```
LogMessage* el::base::LogDispatcher::m_logMessage  [private]
```

Definition at line 2782 of file easylogging++.h.

9.31.4.3 m_proceed

```
bool el::base::LogDispatcher::m_proceed  [private]
```

Definition at line 2781 of file easylogging++.h.

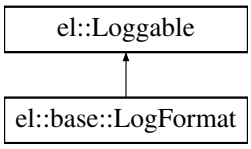
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.32 el::base::LogFormat Class Reference

Represents log format containing flags and date format. This is used internally to start initial log.

Inheritance diagram for el::base::LogFormat:



Public Member Functions

- LogFormat (void)
- LogFormat (Level level, const base::type::string_t &format)
- LogFormat (const LogFormat &logFormat)
- LogFormat (LogFormat &&logFormat)
- LogFormat & operator= (const LogFormat &logFormat)
- virtual ~LogFormat (void)
- bool operator== (const LogFormat &other)
- void parseFromFormat (const base::type::string_t &userFormat)

  Updates format to be used while logging.
- Level level (void) const
- const base::type::string_t & userFormat (void) const
- const base::type::string_t & format (void) const
- const std::string & dateTimeFormat (void) const
- base::type::EnumType flags (void) const
- bool hasFlag (base::FormatFlags flag) const
- virtual void log (el::base::type::ostream_t &os) const

Public Member Functions inherited from el::Loggable

- virtual ~Loggable (void)

Protected Member Functions

- virtual void updateDateFormat (std::size_t index, base::type::string_t &currFormat) ELPP_FINAL

  Updates date time format if available in currFormat.
- virtual void updateFormatSpec (void) ELPP_FINAL

  Updates level from format. This is so that we dont have to do it at log-writing-time. It uses m_format and m_level.
- void addFlag (base::FormatFlags flag)

Private Attributes

- Level m_level
- base::type::string_t m_userFormat
- base::type::string_t m_format
- std::string m_dateTimeFormat
- base::type::EnumType m_flags
- std::string m_currentUser
- std::string m_currentHost

Friends

- class el::Logger

9.32.1 Detailed Description

Represents log format containing flags and date format. This is used internally to start initial log.

Definition at line 1575 of file easylogging++.h.

9.32.2 Constructor & Destructor Documentation

9.32.2.1 LogFormat() [1/4]

```
el::base::LogFormat::LogFormat (
            void  )
```

Definition at line 1430 of file easylogging++.cc.

9.32.2.2 LogFormat() [2/4]

```
el::base::LogFormat::LogFormat (
            Level level,
            const base::type::string_t & format )
```

Definition at line 1440 of file easylogging++.cc.

References m_userFormat, and parseFromFormat().

9.32.2.3 LogFormat() [3/4]

```
el::base::LogFormat::LogFormat (
            const LogFormat & logFormat )
```

Definition at line 1446 of file easylogging++.cc.

9.32.2.4 LogFormat() [4/4]

```
el::base::LogFormat::LogFormat (
            LogFormat && logFormat )
```

Definition at line 1456 of file easylogging++.cc.

References m_currentHost, m_currentUser, m_dateTimeFormat, m_flags, m_format, m_level, and m_userFormat.

9.32.2.5 ~LogFormat()

```
virtual el::base::LogFormat::~LogFormat (
            void  )  [inline], [virtual]
```

Definition at line 1582 of file easylogging++.h.

9.32.3 Member Function Documentation

9.32.3.1 addFlag()

```
void el::base::LogFormat::addFlag (
            base::FormatFlags flag )  [inline], [protected]
```

Definition at line 1626 of file easylogging++.h.

9.32.3.2 dateTimeFormat()

```
const std::string & el::base::LogFormat::dateTimeFormat (
            void  ) const  [inline]
```

Definition at line 1601 of file easylogging++.h.

9.32.3.3 flags()

```
base::type::EnumType el::base::LogFormat::flags (
            void  ) const  [inline]
```

Definition at line 1605 of file easylogging++.h.

9.32.3.4 format()

```
const base::type::string_t & el::base::LogFormat::format (
            void  ) const  [inline]
```

Definition at line 1597 of file easylogging++.h.

9.32.3.5 hasFlag()

```
bool el::base::LogFormat::hasFlag (
            base::FormatFlags flag ) const  [inline]
```

Definition at line 1609 of file easylogging++.h.

9.32.3.6 level()

```
Level el::base::LogFormat::level (
            void  ) const  [inline]
```

Definition at line 1589 of file easylogging++.h.

9.32.3.7 log()

```
virtual void el::base::LogFormat::log (
            el::base::type::ostream_t & os ) const  [inline], [virtual]
```

Implements el::Loggable.

Definition at line 1613 of file easylogging++.h.

9.32.3.8 operator=()

```
LogFormat & el::base::LogFormat::operator= (
            const LogFormat & logFormat )
```

Definition at line 1466 of file easylogging++.cc.

References m_currentHost, m_currentUser, m_dateTimeFormat, m_flags, m_level, and m_userFormat.

9.32.3.9 operator==()

```
bool el::base::LogFormat::operator== (
            const LogFormat & other )
```

Definition at line 1478 of file easylogging++.cc.

References m_dateTimeFormat, m_flags, m_format, m_level, and m_userFormat.

9.32.3.10 parseFromFormat()

```
void el::base::LogFormat::parseFromFormat (
            const base::type::string_t & userFormat )
```

Updates format to be used while logging.

Parameters

userFormat	User provided format

Definition at line 1485 of file easylogging++.cc.

References addFlag(), el::base::AppName, el::base::DateTime, el::base::File, el::base::FileBase, el::base::Function, hasFlag(), el::base::Host, el::base::consts::kAppNameFormatSpecifier, el::base::consts::kCurrentHostFormatSpecifier,

el::base::consts::kCurrentUserFormatSpecifier, el::base::consts::kDateTimeFormatSpecifier, el::base::consts::kFormatSpecifierChar, el::base::consts::kLogFileBaseFormatSpecifier, el::base::consts::kLogFileFormatSpecifier, el::base::consts::kLogFunctionFormatSpe el::base::consts::kLoggerIdFormatSpecifier, el::base::consts::kLogLineFormatSpecifier, el::base::consts::kLogLocationFormatSpecifi el::base::consts::kMessageFormatSpecifier, el::base::consts::kSeverityLevelFormatSpecifier, el::base::consts::kSeverityLevelShortFo el::base::consts::kThreadIdFormatSpecifier, el::base::consts::kVerboseLevelFormatSpecifier, el::base::Level, el::base::LevelShort, el::base::Line, el::base::Location, el::base::LoggerId, el::base::LogMessage, m_flags, m_format, el::base::ThreadId, updateDateFormat(), updateFormatSpec(), el::base::User, userFormat(), and el::base::VerboseLevel.

9.32.3.11 updateDateFormat()

```
void el::base::LogFormat::updateDateFormat (
            std::size_t index,
            base::type::string_t & currFormat )  [protected], [virtual]
```

Updates date time format if available in currFormat.

Parameters

	index	Index where datetime, date or time was found
in,out	*currFormat*	current format that is being used to format

Definition at line 1535 of file easylogging++.cc.

References el::base::DateTime, ELPP_STRLEN, hasFlag(), el::base::consts::kDateTimeFormatSpecifier, el::base::consts::kDefaultDateTimeFormat, and m_dateTimeFormat.

9.32.3.12 updateFormatSpec()

```
void el::base::LogFormat::updateFormatSpec (
            void )  [protected], [virtual]
```

Updates level from format. This is so that we dont have to do it at log-writing-time. It uses m_format and m_level.

Definition at line 1562 of file easylogging++.cc.

References el::Debug, el::Error, el::Fatal, hasFlag(), el::base::Host, el::Info, el::base::consts::kCurrentHostFormatSpecifier, el::base::consts::kCurrentUserFormatSpecifier, el::base::consts::kDebugLevelLogValue, el::base::consts::kDebugLevelShortLogValue el::base::consts::kErrorLevelLogValue, el::base::consts::kErrorLevelShortLogValue, el::base::consts::kFatalLevelLogValue, el::base::consts::kFatalLevelShortLogValue, el::base::consts::kInfoLevelLogValue, el::base::consts::kInfoLevelShortLogValue, el::base::consts::kSeverityLevelFormatSpecifier, el::base::consts::kSeverityLevelShortFormatSpecifier, el::base::consts::kTraceLevelL el::base::consts::kTraceLevelShortLogValue, el::base::consts::kVerboseLevelLogValue, el::base::consts::kVerboseLevelShortLogValu el::base::consts::kWarningLevelLogValue, el::base::consts::kWarningLevelShortLogValue, m_currentHost, m_currentUser, m_format, m_level, el::base::utils::Str::replaceFirstWithEscape(), el::Trace, el::base::User, el::Verbose, and el::Warning.

9.32.3.13 userFormat()

```
const base::type::string_t & el::base::LogFormat::userFormat (
            void ) const  [inline]
```

Definition at line 1593 of file easylogging++.h.

9.32.4 Friends And Related Symbol Documentation

9.32.4.1 el::Logger

```
friend class el::Logger  [friend]
```

Definition at line 1638 of file easylogging++.h.

9.32.5 Field Documentation

9.32.5.1 m_currentHost

```
std::string el::base::LogFormat::m_currentHost  [private]
```

Definition at line 1637 of file easylogging++.h.

9.32.5.2 m_currentUser

```
std::string el::base::LogFormat::m_currentUser  [private]
```

Definition at line 1636 of file easylogging++.h.

9.32.5.3 m_dateTimeFormat

```
std::string el::base::LogFormat::m_dateTimeFormat  [private]
```

Definition at line 1634 of file easylogging++.h.

9.32.5.4 m_flags

```
base::type::EnumType el::base::LogFormat::m_flags  [private]
```

Definition at line 1635 of file easylogging++.h.

9.32.5.5 m_format

```
base::type::string_t el::base::LogFormat::m_format  [private]
```

Definition at line 1633 of file easylogging++.h.

9.32.5.6 m_level

```
Level el::base::LogFormat::m_level  [private]
```

Definition at line 1631 of file easylogging++.h.

9.32.5.7 m_userFormat

```
base::type::string_t el::base::LogFormat::m_userFormat  [private]
```

Definition at line 1632 of file easylogging++.h.

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

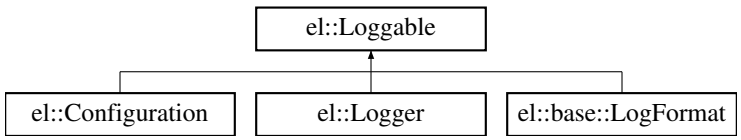
- include/easylogging++.h
- lib/easylogging++.cc

9.33 el::Loggable Class Reference

Base of Easylogging++ friendly class.

```
#include <easylogging++.h>
```

Inheritance diagram for el::Loggable:



Public Member Functions

- virtual ~Loggable (void)
- virtual void log (el::base::type::ostream_t &) const =0

Friends

- el::base::type::ostream_t & operator<< (el::base::type::ostream_t &os, const Loggable &loggable)

9.33.1 Detailed Description

Base of Easylogging++ friendly class.

@detail After inheriting this class publicly, implement pure-virtual function `void log(std::ostream&) const`

Definition at line 1563 of file easylogging++.h.

9.33.2 Constructor & Destructor Documentation

9.33.2.1 ~Loggable()

```
virtual el::Loggable::~Loggable (
            void  )  [inline], [virtual]
```

Definition at line 1565 of file easylogging++.h.

9.33.3 Member Function Documentation

9.33.3.1 log()

```
virtual void el::Loggable::log (
            el::base::type::ostream_t &  ) const  [pure virtual]
```

Implemented in el::base::LogFormat, el::Configuration, and el::Logger.

9.33.4 Friends And Related Symbol Documentation

9.33.4.1 operator<<

```
el::base::type::ostream_t & operator<< (
            el::base::type::ostream_t & os,
            const Loggable & loggable )  [friend]
```

Definition at line 1568 of file easylogging++.h.

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

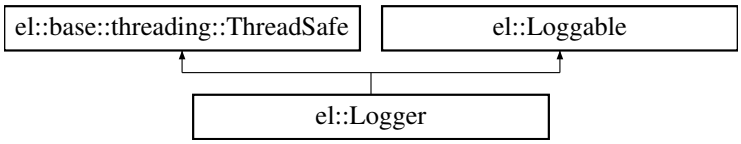
- include/easylogging++.h

9.34 el::Logger Class Reference

Represents a logger holding ID and configurations we need to write logs.

```
#include <easylogging++.h>
```

Inheritance diagram for el::Logger:



Public Member Functions

- Logger (const std::string &id, base::LogStreamsReferenceMapPtr logStreamsReference)
- Logger (const std::string &id, const Configurations &configurations, base::LogStreamsReferenceMapPtr logStreamsReference)
- Logger (const Logger &logger)
- Logger & operator= (const Logger &logger)
- virtual ~Logger (void)
- virtual void log (el::base::type::ostream_t &os) const
- void configure (const Configurations &configurations)

  Configures the logger using specified configurations.
- void reconfigure (void)

  Reconfigures logger using existing configurations.
- const std::string & id (void) const
- const std::string & parentApplicationName (void) const
- void setParentApplicationName (const std::string &parentApplicationName)
- Configurations * configurations (void)
- base::TypedConfigurations * typedConfigurations (void)
- void flush (void)

  Flushes logger to sync all log files for all levels.
- void flush (Level level, base::type::fstream_t *fs)
- bool isFlushNeeded (Level level)
- LogBuilder * logBuilder (void) const
- void setLogBuilder (const LogBuilderPtr &logBuilder)
- bool enabled (Level level) const

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Public Member Functions inherited from el::Loggable

- virtual ~Loggable (void)

Static Public Member Functions

- static bool isValidId (const std::string &id)

Private Member Functions

- Logger (void)
- void initUnflushedCount (void)
- base::type::stringstream_t & stream (void)
- void resolveLoggerFormatSpec (void) const

Private Attributes

- std::string m_id
- base::TypedConfigurations * m_typedConfigurations
- base::type::stringstream_t m_stream
- std::string m_parentApplicationName
- bool m_isConfigured
- Configurations m_configurations
- std::unordered_map< Level, unsigned int > m_unflushedCount
- base::LogStreamsReferenceMapPtr m_logStreamsReference = nullptr
- LogBuilderPtr m_logBuilder

Friends

- class el::LogMessage
- class el::Loggers
- class el::Helpers
- class el::base::RegisteredLoggers
- class el::base::DefaultLogDispatchCallback
- class el::base::MessageBuilder
- class el::base::Writer
- class el::base::PErrorWriter
- class el::base::Storage
- class el::base::PerformanceTracker
- class el::base::LogDispatcher

Additional Inherited Members

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

9.34.1 Detailed Description

Represents a logger holding ID and configurations we need to write logs.

@detail This class does not write logs itself instead its used by writer to read configurations from.

Definition at line 2213 of file easylogging++.h.

9.34.2 Constructor & Destructor Documentation

9.34.2.1 Logger() [1/4]

```
el::Logger::Logger (
            const std::string & id,
            base::LogStreamsReferenceMapPtr logStreamsReference )
```

Definition at line 598 of file easylogging++.cc.

References initUnflushedCount().

9.34.2.2 Logger() [2/4]

```
el::Logger::Logger (
            const std::string & id,
            const Configurations & configurations,
            base::LogStreamsReferenceMapPtr logStreamsReference )
```

Definition at line 607 of file easylogging++.cc.

References configurations(), configure(), and initUnflushedCount().

9.34.2.3 Logger() [3/4]

```
el::Logger::Logger (
            const Logger & logger )
```

Definition at line 618 of file easylogging++.cc.

References m_configurations, m_id, m_isConfigured, m_logStreamsReference, m_parentApplicationName, m_typedConfigurations, m_unflushedCount, and el::base::utils::safeDelete().

9.34.2.4 ~Logger()

```
virtual el::Logger::~Logger (
            void  )  [inline], [virtual]
```

Definition at line 2220 of file easylogging++.h.

9.34.2.5 Logger() [4/4]

```
el::Logger::Logger (
            void  )  [private]
```

9.34.3 Member Function Documentation

9.34.3.1 configurations()

```
Configurations * el::Logger::configurations (
            void  )  [inline]
```

Definition at line 2246 of file easylogging++.h.

9.34.3.2 configure()

```
void el::Logger::configure (
            const Configurations & configurations )
```

Configures the logger using specified configurations.

Definition at line 643 of file easylogging++.cc.

References configurations(), el::base::TypedConfigurations::configurations(), el::Filename, flush(), el::Global, el::Configurations::hasConfiguration(), initUnflushedCount(), el::base::threading::ThreadSafe::lock(), m_configurations, m_isConfigured, m_logStreamsReference, m_typedConfigurations, resolveLoggerFormatSpec(), el::base::utils::safeDelete(), and el::Configurations::setFromBase().

9.34.3.3 enabled()

```
bool el::Logger::enabled (
            Level level ) const  [inline]
```

Definition at line 2273 of file easylogging++.h.

9.34.3.4 flush() [1/2]

```
void el::Logger::flush (
            Level level,
            base::type::fstream_t * fs )
```

Definition at line 686 of file easylogging++.cc.

References el::base::TypedConfigurations::fileStream(), m_typedConfigurations, m_unflushedCount, el::base::TypedConfigurations::to and el::Helpers::validateFileRolling().

9.34.3.5 flush() [2/2]

```
void el::Logger::flush (
            void  )
```

Flushes logger to sync all log files for all levels.

Definition at line 676 of file easylogging++.cc.

References el::LevelHelper::castFromInt(), ELPP_INTERNAL_INFO, flush(), el::LevelHelper::forEachLevel(), el::LevelHelper::kMinValid, el::base::threading::ThreadSafe::lock(), and m_id.

9.34.3.6 id()

```
const std::string & el::Logger::id (
            void  ) const  [inline]
```

Definition at line 2234 of file easylogging++.h.

9.34.3.7 initUnflushedCount()

```
void el::Logger::initUnflushedCount (
            void  )  [private]
```

Definition at line 700 of file easylogging++.cc.

References el::LevelHelper::castFromInt(), el::LevelHelper::forEachLevel(), el::LevelHelper::kMinValid, and m_unflushedCount.

9.34.3.8 isFlushNeeded()

```
bool el::Logger::isFlushNeeded (
            Level level )  [inline]
```

Definition at line 2261 of file easylogging++.h.

9.34.3.9 isValidId()

```
bool el::Logger::isValidId (
            const std::string & id )  [static]
```

Definition at line 667 of file easylogging++.cc.

References el::base::utils::Str::contains(), and el::base::consts::kValidLoggerIdSymbols.

9.34.3.10 log()

```
virtual void el::Logger::log (
            el::base::type::ostream_t & os ) const  [inline], [virtual]
```

Implements el::Loggable.

Definition at line 2224 of file easylogging++.h.

9.34.3.11 logBuilder()

```
LogBuilder * el::Logger::logBuilder (
            void  ) const  [inline]
```

Definition at line 2265 of file easylogging++.h.

9.34.3.12 operator=()

```
Logger & el::Logger::operator= (
            const Logger & logger )
```

Definition at line 629 of file easylogging++.cc.

References m_configurations, m_id, m_isConfigured, m_logStreamsReference, m_parentApplicationName, m_typedConfigurations, m_unflushedCount, and el::base::utils::safeDelete().

9.34.3.13 parentApplicationName()

```
const std::string & el::Logger::parentApplicationName (
            void  ) const  [inline]
```

Definition at line 2238 of file easylogging++.h.

9.34.3.14 reconfigure()

```
void el::Logger::reconfigure (
            void  )
```

Reconfigures logger using existing configurations.

Definition at line 662 of file easylogging++.cc.

References configure(), ELPP_INTERNAL_INFO, m_configurations, and m_id.

9.34.3.15 resolveLoggerFormatSpec()

```
void el::Logger::resolveLoggerFormatSpec (
            void  ) const  [private]
```

Definition at line 709 of file easylogging++.cc.

References el::LevelHelper::castFromInt(), el::LevelHelper::forEachLevel(), el::base::consts::kLoggerIdFormatSpecifier, el::LevelHelper::kMinValid, el::base::TypedConfigurations::logFormat(), el::base::LogFormat::m_format, m_id, m_typedConfigurations, and el::base::utils::Str::replaceFirstWithEscape().

9.34.3.16 setLogBuilder()

```
void el::Logger::setLogBuilder (
            const LogBuilderPtr & logBuilder )  [inline]
```

Definition at line 2269 of file easylogging++.h.

9.34.3.17 setParentApplicationName()

```
void el::Logger::setParentApplicationName (
            const std::string & parentApplicationName )  [inline]
```

Definition at line 2242 of file easylogging++.h.

9.34.3.18 stream()

```
base::type::stringstream_t & el::Logger::stream (
            void  )  [inline], [private]
```

Definition at line 2339 of file easylogging++.h.

9.34.3.19 typedConfigurations()

```
base::TypedConfigurations * el::Logger::typedConfigurations (
            void  )  [inline]
```

Definition at line 2250 of file easylogging++.h.

9.34.4 Friends And Related Symbol Documentation

9.34.4.1 el::base::DefaultLogDispatchCallback

```
friend class el::base::DefaultLogDispatchCallback  [friend]
```

Definition at line 2313 of file easylogging++.h.

9.34.4.2 el::base::LogDispatcher

```
friend class el::base::LogDispatcher  [friend]
```

Definition at line 2319 of file easylogging++.h.

9.34.4.3 el::base::MessageBuilder

```
friend class el::base::MessageBuilder  [friend]
```

Definition at line 2314 of file easylogging++.h.

9.34.4.4 el::base::PerformanceTracker

```
friend class el::base::PerformanceTracker  [friend]
```

Definition at line 2318 of file easylogging++.h.

9.34.4.5 el::base::PErrorWriter

```
friend class el::base::PErrorWriter  [friend]
```

Definition at line 2316 of file easylogging++.h.

9.34.4.6 el::base::RegisteredLoggers

```
friend class el::base::RegisteredLoggers  [friend]
```

Definition at line 2312 of file easylogging++.h.

9.34.4.7 el::base::Storage

```
friend class el::base::Storage  [friend]
```

Definition at line 2317 of file easylogging++.h.

9.34.4.8 el::base::Writer

```
friend class el::base::Writer  [friend]
```

Definition at line 2315 of file easylogging++.h.

9.34.4.9 el::Helpers

```
friend class el::Helpers  [friend]
```

Definition at line 2311 of file easylogging++.h.

9.34.4.10 el::Loggers

```
friend class el::Loggers  [friend]
```

Definition at line 2310 of file easylogging++.h.

9.34.4.11 el::LogMessage

```
friend class el::LogMessage  [friend]
```

Definition at line 2309 of file easylogging++.h.

9.34.5 Field Documentation

9.34.5.1 m_configurations

```
Configurations el::Logger::m_configurations  [private]
```

Definition at line 2304 of file easylogging++.h.

9.34.5.2 m_id

```
std::string el::Logger::m_id  [private]
```

Definition at line 2299 of file easylogging++.h.

9.34.5.3 m_isConfigured

```
bool el::Logger::m_isConfigured  [private]
```

Definition at line 2303 of file easylogging++.h.

9.34.5.4 m_logBuilder

```
LogBuilderPtr el::Logger::m_logBuilder  [private]
```

Definition at line 2307 of file easylogging++.h.

9.34.5.5 m_logStreamsReference

```
base::LogStreamsReferenceMapPtr el::Logger::m_logStreamsReference = nullptr  [private]
```

Definition at line 2306 of file easylogging++.h.

9.34.5.6 m_parentApplicationName

```
std::string el::Logger::m_parentApplicationName  [private]
```

Definition at line 2302 of file easylogging++.h.

9.34.5.7 m_stream

```
base::type::stringstream_t el::Logger::m_stream  [private]
```

Definition at line 2301 of file easylogging++.h.

9.34.5.8 m_typedConfigurations

```
base::TypedConfigurations* el::Logger::m_typedConfigurations  [private]
```

Definition at line 2300 of file easylogging++.h.

9.34.5.9 m_unflushedCount

```
std::unordered_map<Level, unsigned int> el::Logger::m_unflushedCount  [private]
```

Definition at line 2305 of file easylogging++.h.

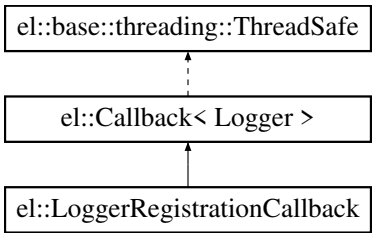
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.35 el::LoggerRegistrationCallback Class Reference

`#include <easylogging++.h>`

Inheritance diagram for el::LoggerRegistrationCallback:



Friends

- class base::RegisteredLoggers

Additional Inherited Members

Public Member Functions inherited from el::Callback< Logger >

- Callback (void)
- bool enabled (void) const
- void setEnabled (bool enabled)

Protected Member Functions inherited from el::Callback< Logger >

- virtual void handle (const Logger *handlePtr)=0

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

9.35.1 Detailed Description

Definition at line 2193 of file easylogging++.h.

9.35.2 Friends And Related Symbol Documentation

9.35.2.1 base::RegisteredLoggers

```
friend class base::RegisteredLoggers  [friend]
```

Definition at line 2195 of file easylogging++.h.

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

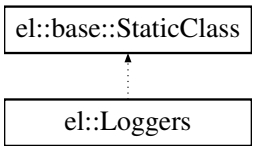
- include/easylogging++.h

9.36 el::Loggers Class Reference

Static helpers to deal with loggers and their configurations.

```
#include <easylogging++.h>
```

Inheritance diagram for el::Loggers:



Data Structures

- class ScopedAddFlag

  Adds flag and removes it when scope goes out.
- class ScopedRemoveFlag

  Removes flag and add it when scope goes out.

Static Public Member Functions

- static Logger * getLogger (const std::string &identity, bool registerIfNotAvailable=true)

  Gets existing or registers new logger.
- static void setDefaultLogBuilder (el::LogBuilderPtr &logBuilderPtr)

  Changes default log builder for future loggers.
- template<typename T >
  static bool installLoggerRegistrationCallback (const std::string &id)

  Installs logger registration callback, this callback is triggered when new logger is registered.
- template<typename T >
  static void uninstallLoggerRegistrationCallback (const std::string &id)

  Uninstalls log dispatch callback.
- template<typename T >
  static T * loggerRegistrationCallback (const std::string &id)
- static bool unregisterLogger (const std::string &identity)

Unregisters logger - use it only when you know what you are doing, you may unregister loggers initialized / used by third-party libs.

- static bool hasLogger (const std::string &identity)

  Whether or not logger with id is registered.
- static Logger * reconfigureLogger (Logger *logger, const Configurations &configurations)

  Reconfigures specified logger with new configurations.
- static Logger * reconfigureLogger (const std::string &identity, const Configurations &configurations)

  Reconfigures logger with new configurations after looking it up using identity.
- static Logger * reconfigureLogger (const std::string &identity, ConfigurationType configurationType, const std::string &value)

  Reconfigures logger's single configuration.
- static void reconfigureAllLoggers (const Configurations &configurations)

  Reconfigures all the existing loggers with new configurations.
- static void reconfigureAllLoggers (ConfigurationType configurationType, const std::string &value)

  Reconfigures single configuration for all the loggers.
- static void reconfigureAllLoggers (Level level, ConfigurationType configurationType, const std::string &value)

  Reconfigures single configuration for all the loggers for specified level.
- static void setDefaultConfigurations (const Configurations &configurations, bool reconfigureExisting↩ Loggers=false)

  Sets default configurations. This configuration is used for future (and conditionally for existing) loggers.
- static const Configurations * defaultConfigurations (void)

  Returns current default.
- static const base::LogStreamsReferenceMapPtr logStreamsReference (void)

  Returns log stream reference pointer if needed by user.
- static base::TypedConfigurations defaultTypedConfigurations (void)

  Default typed configuration based on existing defaultConf.
- static std::vector< std::string > * populateAllLoggerIds (std::vector< std::string > *targetList)

  Populates all logger IDs in current repository.
- static void configureFromGlobal (const char *globalConfigurationFilePath)

  Sets configurations from global configuration file.
- static bool configureFromArg (const char *argKey)

  Configures loggers using command line arg. Ensure you have already set command line args,.
- static void flushAll (void)

  Flushes all loggers for all levels - Be careful if you dont know how many loggers are registered.
- static void addFlag (LoggingFlag flag)

  Adds logging flag used internally.
- static void removeFlag (LoggingFlag flag)

  Removes logging flag used internally.
- static bool hasFlag (LoggingFlag flag)

  Determines whether or not certain flag is active.
- static void setLoggingLevel (Level level)

  Sets hierarchy for logging. Needs to enable logging flag (HierarchicalLogging)
- static void setVerboseLevel (base::type::VerboseLevel level)

  Sets verbose level on the fly.
- static base::type::VerboseLevel verboseLevel (void)

  Gets current verbose level.
- static void setVModules (const char *modules)

  Sets vmodules as specified (on the fly)
- static void clearVModules (void)

  Clears vmodules.

9.36.1 Detailed Description

Static helpers to deal with loggers and their configurations.

Definition at line 3783 of file easylogging++.h.

9.36.2 Member Function Documentation

9.36.2.1 addFlag()

```
static void el::Loggers::addFlag (
            LoggingFlag flag )  [inline], [static]
```

Adds logging flag used internally.

Definition at line 3846 of file easylogging++.h.

References ELPP.

9.36.2.2 clearVModules()

```
void el::Loggers::clearVModules (
            void  )  [static]
```

Clears vmodules.

Definition at line 3102 of file easylogging++.cc.

References ELPP.

9.36.2.3 configureFromArg()

```
bool el::Loggers::configureFromArg (
            const char * argKey )  [static]
```

Configures loggers using command line arg. Ensure you have already set command line args,.

Returns

False if invalid argument or argument with no value provided, true if attempted to configure logger. If true is returned that does not mean it has been configured successfully, it only means that it has attempted to configure logger using configuration file provided in argument

Definition at line 3072 of file easylogging++.cc.

References ELPP_UNUSED.

9.36.2.4 configureFromGlobal()

```
void el::Loggers::configureFromGlobal (
            const char * globalConfigurationFilePath )  [static]
```

Sets configurations from global configuration file.

Definition at line 3031 of file easylogging++.cc.

References el::Logger::configure(), ELPP_ASSERT, ELPP_INTERNAL_INFO, el::Logger::id(), and el::Configurations::parseFromText

9.36.2.5 defaultConfigurations()

```
const Configurations * el::Loggers::defaultConfigurations (
            void  )  [static]
```

Returns current default.

Definition at line 3008 of file easylogging++.cc.

References ELPP.

9.36.2.6 defaultTypedConfigurations()

```
base::TypedConfigurations el::Loggers::defaultTypedConfigurations (
            void  )  [static]
```

Default typed configuration based on existing defaultConf.

Definition at line 3016 of file easylogging++.cc.

References ELPP.

9.36.2.7 flushAll()

```
void el::Loggers::flushAll (
            void  )  [static]
```

Flushes all loggers for all levels - Be careful if you dont know how many loggers are registered.

Definition at line 3084 of file easylogging++.cc.

References ELPP.

9.36.2.8 getLogger()

```
Logger * el::Loggers::getLogger (
            const std::string & identity,
            bool registerIfNotAvailable = true )  [static]
```

Gets existing or registers new logger.

Definition at line 2947 of file easylogging++.cc.

References ELPP.

9.36.2.9 hasFlag()

```
static bool el::Loggers::hasFlag (
            LoggingFlag flag )  [inline], [static]
```

Determines whether or not certain flag is active.

Definition at line 3854 of file easylogging++.h.

References ELPP.

9.36.2.10 hasLogger()

```
bool el::Loggers::hasLogger (
            const std::string & identity )  [static]
```

Whether or not logger with id is registered.

Definition at line 2959 of file easylogging++.cc.

References ELPP.

9.36.2.11 installLoggerRegistrationCallback()

```
template<typename T >
static bool el::Loggers::installLoggerRegistrationCallback (
            const std::string & id )  [inline], [static]
```

Installs logger registration callback, this callback is triggered when new logger is registered.

Definition at line 3791 of file easylogging++.h.

References ELPP.

9.36.2.12 loggerRegistrationCallback()

```
template<typename T >
static T * el::Loggers::loggerRegistrationCallback (
            const std::string & id )  [inline], [static]
```

Definition at line 3800 of file easylogging++.h.

References ELPP.

9.36.2.13 logStreamsReference()

```
const base::LogStreamsReferenceMapPtr el::Loggers::logStreamsReference (
            void  )  [static]
```

Returns log stream reference pointer if needed by user.

Definition at line 3012 of file easylogging++.cc.

References ELPP.

9.36.2.14 populateAllLoggerIds()

```
std::vector< std::string > * el::Loggers::populateAllLoggerIds (
            std::vector< std::string > * targetList )  [static]
```

Populates all logger IDs in current repository.

Parameters

out	*targetList*	List of fill up.

Definition at line 3022 of file easylogging++.cc.

References ELPP.

9.36.2.15 reconfigureAllLoggers() [1/3]

```
static void el::Loggers::reconfigureAllLoggers (
             ConfigurationType configurationType,
             const std::string & value )  [inline], [static]
```

Reconfigures single configuration for all the loggers.

Definition at line 3818 of file easylogging++.h.

9.36.2.16 reconfigureAllLoggers() [2/3]

```
void el::Loggers::reconfigureAllLoggers (
             const Configurations & configurations )  [static]
```

Reconfigures all the existing loggers with new configurations.

Definition at line 2984 of file easylogging++.cc.

References ELPP.

9.36.2.17 reconfigureAllLoggers() [3/3]

```
void el::Loggers::reconfigureAllLoggers (
             Level level,
             ConfigurationType configurationType,
             const std::string & value )  [static]
```

Reconfigures single configuration for all the loggers for specified level.

Definition at line 2991 of file easylogging++.cc.

References el::Logger::configurations(), ELPP, el::Logger::reconfigure(), and el::Configurations::set().

9.36.2.18 reconfigureLogger() [1/3]

```
Logger * el::Loggers::reconfigureLogger (
             const std::string & identity,
             ConfigurationType configurationType,
             const std::string & value )  [static]
```

Reconfigures logger's single configuration.

Definition at line 2973 of file easylogging++.cc.

References el::Logger::configurations(), el::Logger::reconfigure(), and el::Configurations::set().

9.36.2.19 reconfigureLogger() [2/3]

```
Logger * el::Loggers::reconfigureLogger (
            const std::string & identity,
            const Configurations & configurations )  [static]
```

Reconfigures logger with new configurations after looking it up using identity.

Definition at line 2969 of file easylogging++.cc.

9.36.2.20 reconfigureLogger() [3/3]

```
Logger * el::Loggers::reconfigureLogger (
            Logger * logger,
            const Configurations & configurations )  [static]
```

Reconfigures specified logger with new configurations.

Definition at line 2963 of file easylogging++.cc.

References el::Logger::configure().

9.36.2.21 removeFlag()

```
static void el::Loggers::removeFlag (
            LoggingFlag flag )  [inline], [static]
```

Removes logging flag used internally.

Definition at line 3850 of file easylogging++.h.

References ELPP.

9.36.2.22 setDefaultConfigurations()

```
void el::Loggers::setDefaultConfigurations (
            const Configurations & configurations,
            bool reconfigureExistingLoggers = false )  [static]
```

Sets default configurations. This configuration is used for future (and conditionally for existing) loggers.

Definition at line 3001 of file easylogging++.cc.

References ELPP.

9.36.2.23 setDefaultLogBuilder()

```
void el::Loggers::setDefaultLogBuilder (
            el::LogBuilderPtr & logBuilderPtr )  [static]
```

Changes default log builder for future loggers.

Definition at line 2951 of file easylogging++.cc.

References ELPP.

9.36.2.24 setLoggingLevel()

```
static void el::Loggers::setLoggingLevel (
            Level level )  [inline], [static]
```

Sets hierarchy for logging. Needs to enable logging flag (HierarchicalLogging)

Definition at line 3882 of file easylogging++.h.

References ELPP.

9.36.2.25 setVerboseLevel()

```
void el::Loggers::setVerboseLevel (
            base::type::VerboseLevel level )  [static]
```

Sets verbose level on the fly.

Definition at line 3088 of file easylogging++.cc.

References ELPP.

9.36.2.26 setVModules()

```
void el::Loggers::setVModules (
            const char * modules )  [static]
```

Sets vmodules as specified (on the fly)

Definition at line 3096 of file easylogging++.cc.

References ELPP.

9.36.2.27 uninstallLoggerRegistrationCallback()

```
template<typename T >
static void el::Loggers::uninstallLoggerRegistrationCallback (
            const std::string & id )  [inline], [static]
```

Uninstalls log dispatch callback.

Definition at line 3796 of file easylogging++.h.

References ELPP.

9.36.2.28 unregisterLogger()

```
bool el::Loggers::unregisterLogger (
            const std::string & identity )  [static]
```

Unregisters logger - use it only when you know what you are doing, you may unregister loggers initialized / used by third-party libs.

Definition at line 2955 of file easylogging++.cc.

References ELPP.

9.36.2.29 verboseLevel()

```
base::type::VerboseLevel el::Loggers::verboseLevel (
             void  )  [static]
```

Gets current verbose level.

Definition at line 3092 of file easylogging++.cc.

References ELPP.

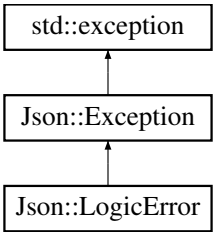
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.37 Json::LogicError Class Reference

```
#include <value.h>
```

Inheritance diagram for Json::LogicError:



Public Member Functions

- LogicError (String const &msg)

Public Member Functions inherited from Json::Exception

- Exception (String msg)
- ~Exception () noexcept override
- char const * what () const noexcept override

Additional Inherited Members

Protected Attributes inherited from Json::Exception

- String msg_

9.37.1 Detailed Description

Exceptions thrown by JSON_ASSERT/JSON_FAIL macros.

These are precondition-violations (user bugs) and internal errors (our bugs).

Remarks

derived from Json::Exception

Definition at line 95 of file value.h.

9.37.2 Constructor & Destructor Documentation

9.37.2.1 LogicError()

```
Json::LogicError::LogicError (
            String const & msg )
```

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

- include/jsoncpp/value.h

9.38 el::LogMessage Class Reference

```
#include <easylogging++.h>
```

Public Member Functions

- LogMessage (Level level, const std::string &file, base::type::LineNumber line, const std::string &func, base::type::VerboseLevel verboseLevel, Logger *logger)
- Level level (void) const
- const std::string & file (void) const
- base::type::LineNumber line (void) const
- const std::string & func (void) const
- base::type::VerboseLevel verboseLevel (void) const
- Logger * logger (void) const
- const base::type::string_t & message (void) const

Private Attributes

- Level m_level
- std::string m_file
- base::type::LineNumber m_line
- std::string m_func
- base::type::VerboseLevel m_verboseLevel
- Logger * m_logger
- base::type::string_t m_message

9.38.1 Detailed Description

Definition at line 2454 of file easylogging++.h.

9.38.2 Constructor & Destructor Documentation

9.38.2.1 LogMessage()

```
el::LogMessage::LogMessage (
            Level level,
            const std::string & file,
            base::type::LineNumber line,
            const std::string & func,
            base::type::VerboseLevel verboseLevel,
            Logger * logger )  [inline]
```

Definition at line 2456 of file easylogging++.h.

9.38.3 Member Function Documentation

9.38.3.1 file()

```
const std::string & el::LogMessage::file (
            void  ) const  [inline]
```

Definition at line 2464 of file easylogging++.h.

9.38.3.2 func()

```
const std::string & el::LogMessage::func (
            void  ) const  [inline]
```

Definition at line 2470 of file easylogging++.h.

9.38.3.3 level()

```
Level el::LogMessage::level (
            void  ) const  [inline]
```

Definition at line 2461 of file easylogging++.h.

9.38.3.4 line()

```
base::type::LineNumber el::LogMessage::line (
            void  ) const  [inline]
```

Definition at line 2467 of file easylogging++.h.

9.38.3.5 logger()

```
Logger * el::LogMessage::logger (
            void  ) const  [inline]
```

Definition at line 2476 of file easylogging++.h.

9.38.3.6 message()

```
const base::type::string_t & el::LogMessage::message (
            void  ) const  [inline]
```

Definition at line 2479 of file easylogging++.h.

9.38.3.7 verboseLevel()

```
base::type::VerboseLevel el::LogMessage::verboseLevel (
            void  ) const  [inline]
```

Definition at line 2473 of file easylogging++.h.

9.38.4 Field Documentation

9.38.4.1 m_file

```
std::string el::LogMessage::m_file  [private]
```

Definition at line 2484 of file easylogging++.h.

9.38.4.2 m_func

```
std::string el::LogMessage::m_func  [private]
```

Definition at line 2486 of file easylogging++.h.

9.38.4.3 m_level

```
Level el::LogMessage::m_level  [private]
```

Definition at line 2483 of file easylogging++.h.

9.38.4.4 m_line

```
base::type::LineNumber el::LogMessage::m_line  [private]
```

Definition at line 2485 of file easylogging++.h.

9.38.4.5 m_logger

```
Logger* el::LogMessage::m_logger  [private]
```

Definition at line 2488 of file easylogging++.h.

9.38.4.6 m_message

```
base::type::string_t el::LogMessage::m_message  [private]
```

Definition at line 2489 of file easylogging++.h.

9.38.4.7 m_verboseLevel

```
base::type::VerboseLevel el::LogMessage::m_verboseLevel  [private]
```

Definition at line 2487 of file easylogging++.h.

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

- include/easylogging++.h

9.39 el::base::MessageBuilder Class Reference

Public Member Functions

- MessageBuilder (void)
- void initialize (Logger *logger)
- MessageBuilder & operator<< (const std::string &msg)
- MessageBuilder & operator<< (const std::wstring &msg)
- MessageBuilder & operator<< (const wchar_t *msg)
- MessageBuilder & operator<< (std::ostream &(*OStreamMani)(std::ostream &))

Private Member Functions

- template<class Iterator >
  MessageBuilder & writeIterator (Iterator begin_, Iterator end_, std::size_t size_)

Private Attributes

- template<class Class >
  Logger * m_logger
- const base::type::char_t * m_containerLogSeparator

9.39.1 Detailed Description

Definition at line 2862 of file easylogging++.h.

9.39.2 Constructor & Destructor Documentation

9.39.2.1 MessageBuilder()

```
el::base::MessageBuilder::MessageBuilder (
            void  )  [inline]
```

Definition at line 2864 of file easylogging++.h.

9.39.3 Member Function Documentation

9.39.3.1 initialize()

```
void el::base::MessageBuilder::initialize (
            Logger * logger )
```

Definition at line 2505 of file easylogging++.cc.

References ELPP, ELPP_LITERAL, m_containerLogSeparator, m_logger, and el::NewLineForContainer.

9.39.3.2 operator<<() [1/4]

```
MessageBuilder & el::base::MessageBuilder::operator<< (
            const std::string & msg )  [inline]
```

Definition at line 2876 of file easylogging++.h.

9.39.3.3 operator<<() [2/4]

```
MessageBuilder & el::base::MessageBuilder::operator<< (
            const std::wstring & msg )  [inline]
```

Definition at line 2893 of file easylogging++.h.

9.39.3.4 operator<<() [3/4]

```
MessageBuilder & el::base::MessageBuilder::operator<< (
            const wchar_t * msg )
```

Definition at line 2511 of file easylogging++.cc.

References el::AutoSpacing, ELPP, el::base::consts::kNullPointer, m_logger, el::Logger::stream(), and el::base::utils::Str::wcharPtrToCharPtr().

9.39.3.5 operator<<() [4/4]

```
MessageBuilder & el::base::MessageBuilder::operator<< (
            std::ostream &(*)(std::ostream &) OStreamMani )  [inline]
```

Definition at line 2898 of file easylogging++.h.

9.39.3.6 writeIterator()

```
template<class Iterator >
MessageBuilder & el::base::MessageBuilder::writeIterator (
            Iterator begin_,
            Iterator end_,
            std::size_t size_ )  [inline], [private]
```

Definition at line 3154 of file easylogging++.h.

References ELPP, ELPP_LITERAL, and el::Logger::stream().

9.39.4 Field Documentation

9.39.4.1 m_containerLogSeparator

```
const base::type::char_t* el::base::MessageBuilder::m_containerLogSeparator  [private]
```

Definition at line 3151 of file easylogging++.h.

9.39.4.2 m_logger

```
template<class Class >
Logger* el::base::MessageBuilder::m_logger  [private]
```

Definition at line 3150 of file easylogging++.h.

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

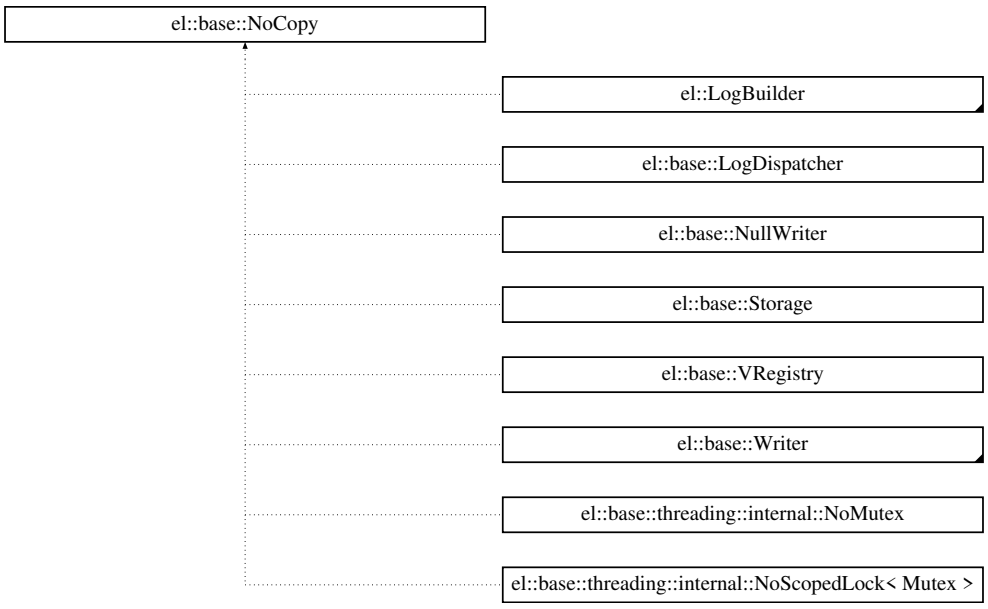
- include/easylogging++.h
- lib/easylogging++.cc

9.40 el::base::NoCopy Class Reference

Internal helper class that prevent copy constructor for class.

`#include <easylogging++.h>`

Inheritance diagram for el::base::NoCopy:



Protected Member Functions

- NoCopy (void)

Private Member Functions

- NoCopy (const NoCopy &)
- NoCopy & operator= (const NoCopy &)

9.40.1 Detailed Description

Internal helper class that prevent copy constructor for class.

@detail When using this class simply inherit it privately

Definition at line 551 of file easylogging++.h.

9.40.2 Constructor & Destructor Documentation

9.40.2.1 NoCopy() [1/2]

```
el::base::NoCopy::NoCopy (
            void  )  [inline], [protected]
```

Definition at line 553 of file easylogging++.h.

9.40.2.2 NoCopy() [2/2]

```
el::base::NoCopy::NoCopy (
            const NoCopy &  )  [private]
```

9.40.3 Member Function Documentation

9.40.3.1 operator=()

```
NoCopy & el::base::NoCopy::operator= (
            const NoCopy &  )  [private]
```

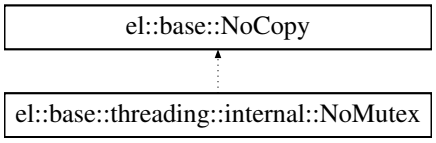
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.41 el::base::threading::internal::NoMutex Class Reference

Mutex wrapper used when multi-threading is disabled.

Inheritance diagram for el::base::threading::internal::NoMutex:



Public Member Functions

- NoMutex (void)
- void lock (void)
- bool try_lock (void)
- void unlock (void)

Additional Inherited Members

Private Member Functions inherited from el::base::NoCopy

- NoCopy (void)

9.41.1 Detailed Description

Mutex wrapper used when multi-threading is disabled.

Definition at line 977 of file easylogging++.h.

9.41.2 Constructor & Destructor Documentation

9.41.2.1 NoMutex()

```
el::base::threading::internal::NoMutex::NoMutex (
            void  )  [inline]
```

Definition at line 979 of file easylogging++.h.

9.41.3 Member Function Documentation

9.41.3.1 lock()

```
void el::base::threading::internal::NoMutex::lock (
            void  )  [inline]
```

Definition at line 980 of file easylogging++.h.

9.41.3.2 try_lock()

```
bool el::base::threading::internal::NoMutex::try_lock (
            void  )  [inline]
```

Definition at line 981 of file easylogging++.h.

9.41.3.3 unlock()

```
void el::base::threading::internal::NoMutex::unlock (
            void  )  [inline]
```

Definition at line 984 of file easylogging++.h.

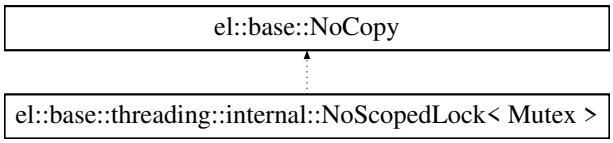
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.42 el::base::threading::internal::NoScopedLock< Mutex > Class Template Reference

Lock guard wrapper used when multi-threading is disabled.

Inheritance diagram for el::base::threading::internal::NoScopedLock< Mutex >:



Public Member Functions

- NoScopedLock (Mutex &)
- virtual ~NoScopedLock (void)

Private Member Functions

- NoScopedLock (void)

Private Member Functions inherited from el::base::NoCopy

- NoCopy (void)

9.42.1 Detailed Description

template<typename Mutex>
class el::base::threading::internal::NoScopedLock< Mutex >

Lock guard wrapper used when multi-threading is disabled.

Definition at line 988 of file easylogging++.h.

9.42.2 Constructor & Destructor Documentation

9.42.2.1 NoScopedLock() [1/2]

```
template<typename Mutex >
el::base::threading::internal::NoScopedLock< Mutex >::NoScopedLock (
            Mutex & ) [inline], [explicit]
```

Definition at line 990 of file easylogging++.h.

9.42.2.2 ~NoScopedLock()

```
template<typename Mutex >
virtual el::base::threading::internal::NoScopedLock< Mutex >::~NoScopedLock (
            void ) [inline], [virtual]
```

Definition at line 992 of file easylogging++.h.

9.42.2.3 NoScopedLock() [2/2]

```
template<typename Mutex >
el::base::threading::internal::NoScopedLock< Mutex >::NoScopedLock (
            void ) [private]
```

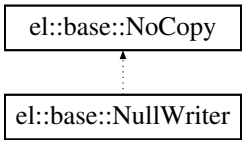
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.43 el::base::NullWriter Class Reference

Writes nothing - Used when certain log is disabled.

Inheritance diagram for el::base::NullWriter:



Public Member Functions

- NullWriter (void)
- NullWriter & operator<< (std::ostream &(*)(std::ostream &))
- template<typename T >
  NullWriter & operator<< (const T &)
- operator bool ()

Additional Inherited Members

Private Member Functions inherited from el::base::NoCopy

- NoCopy (void)

9.43.1 Detailed Description

Writes nothing - Used when certain log is disabled.

Definition at line 3171 of file easylogging++.h.

9.43.2 Constructor & Destructor Documentation

9.43.2.1 NullWriter()

```
el::base::NullWriter::NullWriter (
            void  )  [inline]
```

Definition at line 3173 of file easylogging++.h.

9.43.3 Member Function Documentation

9.43.3.1 operator bool()

```
el::base::NullWriter::operator bool ( )  [inline]
```

Definition at line 3185 of file easylogging++.h.

9.43.3.2 operator<<() [1/2]

```
template<typename T >
NullWriter & el::base::NullWriter::operator<< (
            const T &  )  [inline]
```

Definition at line 3181 of file easylogging++.h.

9.43.3.3 operator<<() [2/2]

```
NullWriter & el::base::NullWriter::operator<< (
             std::ostream & *)(std::ostream & )  [inline]
```

Definition at line 3176 of file easylogging++.h.

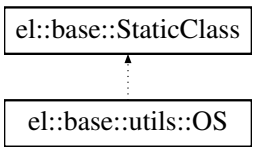
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.44 el::base::utils::OS Class Reference

Operating System helper static class used internally. You should not use it.

Inheritance diagram for el::base::utils::OS:



Static Public Member Functions

- static const std::string getBashOutput (const char *command)

  Runs command on terminal and returns the output.
- static std::string getEnvironmentVariable (const char *variableName, const char *defaultVal, const char *alternativeBashCommand=nullptr)

  Gets environment variable. This is cross-platform and CRT safe (for VC++)
- static std::string currentUser (void)

  Gets current username.
- static std::string currentHost (void)

  Gets current host name or computer name.
- static bool termSupportsColor (void)

  Whether or not terminal supports colors.

9.44.1 Detailed Description

Operating System helper static class used internally. You should not use it.

Definition at line 1137 of file easylogging++.h.

9.44.2 Member Function Documentation

9.44.2.1 currentHost()

```
std::string el::base::utils::OS::currentHost (
            void  )  [static]
```

Gets current host name or computer name.

@detail For android systems this is device name with its manufacturer and model separated by hyphen

Definition at line 1128 of file easylogging++.cc.

References ELPP_UNUSED, getEnvironmentVariable(), and el::base::consts::kUnknownHost.

9.44.2.2 currentUser()

```
std::string el::base::utils::OS::currentUser (
            void  )  [static]
```

Gets current username.

Definition at line 1115 of file easylogging++.cc.

References ELPP_UNUSED, getEnvironmentVariable(), and el::base::consts::kUnknownUser.

9.44.2.3 getBashOutput()

```
const std::string el::base::utils::OS::getBashOutput (
            const char * command )  [static]
```

Runs command on terminal and returns the output.

@detail This is applicable only on unix based systems, for all other OS, an empty string is returned.

Parameters

command	Bash command

Returns

Result of bash output or empty string if no result found.

Definition at line 1063 of file easylogging++.cc.

References ELPP_INTERNAL_ERROR, and ELPP_UNUSED.

9.44.2.4 getEnvironmentVariable()

```
std::string el::base::utils::OS::getEnvironmentVariable (
            const char * variableName,
```

```
            const char * defaultVal,
            const char * alternativeBashCommand = nullptr )  [static]
```

Gets environment variable. This is cross-platform and CRT safe (for VC++)

Parameters

variableName	Environment variable name
defaultVal	If no environment variable or value found the value to return by default
alternativeBashCommand	If environment variable not found what would be alternative bash command in order to look for value user is looking for. E.g, for 'user' alternative command will 'whoami'

Definition at line 1091 of file easylogging++.cc.

References ELPP_UNUSED, and getBashOutput().

9.44.2.5 termSupportsColor()

```
bool el::base::utils::OS::termSupportsColor (
            void  )  [static]
```

Whether or not terminal supports colors.

Definition at line 1141 of file easylogging++.cc.

References getEnvironmentVariable().

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

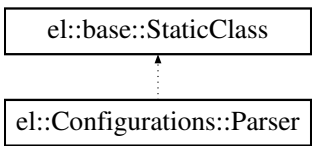
- include/easylogging++.h
- lib/easylogging++.cc

9.45 el::Configurations::Parser Class Reference

Parser used internally to parse configurations from file or text.

```
#include <easylogging++.h>
```

Inheritance diagram for el::Configurations::Parser:



Static Public Member Functions

- static bool parseFromFile (const std::string &configurationFile, Configurations ∗sender, Configurations ∗base=nullptr)

  Parses configuration from file.
- static bool parseFromText (const std::string &configurationsString, Configurations ∗sender, Configurations ∗base=nullptr)

  Parse configurations from configuration string.

Static Private Member Functions

- static void ignoreComments (std::string ∗line)
- static bool isLevel (const std::string &line)
- static bool isComment (const std::string &line)
- static bool isConfig (const std::string &line)
- static bool parseLine (std::string ∗line, std::string ∗currConfigStr, std::string ∗currLevelStr, Level ∗currLevel, Configurations ∗conf)

Friends

- class el::Loggers

9.45.1 Detailed Description

Parser used internally to parse configurations from file or text.

@detail This class makes use of base::utils::Str. You should not need this unless you are working on some tool for Easylogging++

Definition at line 1839 of file easylogging++.h.

9.45.2 Member Function Documentation

9.45.2.1 ignoreComments()

```
void el::Configurations::Parser::ignoreComments (
            std::string * line )  [static], [private]
```

Definition at line 441 of file easylogging++.cc.

References el::base::consts::kConfigurationComment.

9.45.2.2 isComment()

```
bool el::Configurations::Parser::isComment (
            const std::string & line )  [static], [private]
```

Definition at line 464 of file easylogging++.cc.

References el::base::consts::kConfigurationComment, and el::base::utils::Str::startsWith().

9.45.2.3 isConfig()

```
bool el::Configurations::Parser::isConfig (
            const std::string & line )  [inline], [static], [private]
```

Definition at line 468 of file easylogging++.cc.

9.45.2.4 isLevel()

```
bool el::Configurations::Parser::isLevel (
            const std::string & line )  [static], [private]
```

Definition at line 460 of file easylogging++.cc.

References el::base::consts::kConfigurationLevel, and el::base::utils::Str::startsWith().

9.45.2.5 parseFromFile()

```
bool el::Configurations::Parser::parseFromFile (
            const std::string & configurationFile,
            Configurations * sender,
            Configurations * base = nullptr )  [static]
```

Parses configuration from file.

Parameters

configurationFile	Full path to configuration file
sender	Sender configurations pointer. Usually 'this' is used from calling class
base	Configurations to base new configuration repository off. This value is used when you want to use existing Configurations to base all the values and then set rest of configuration via configuration file.

Returns

True if successfully parsed, false otherwise. You may define '_STOP_ON_FIRSTELPP_ASSERTION' to make sure you do not proceed without successful parse.

Definition at line 407 of file easylogging++.cc.

References el::Configurations::configurationFile(), ELPP_ASSERT, parseLine(), el::Configurations::setFromBase(), and el::Unknown.

9.45.2.6 parseFromText()

```
bool el::Configurations::Parser::parseFromText (
            const std::string & configurationsString,
            Configurations * sender,
            Configurations * base = nullptr )  [static]
```

Parse configurations from configuration string.

@detail This configuration string has same syntax as configuration file contents. Make sure all the necessary new line characters are provided. You may define '_STOP_ON_FIRSTELPP_ASSERTION' to make sure you do not proceed without successful parse (This is recommended)

Parameters

configurationsString	the configuration in plain text format
sender	Sender configurations pointer. Usually 'this' is used from calling class
base	Configurations to base new configuration repository off. This value is used when you want to use existing Configurations to base all the values and then set rest of configuration via configuration text.

Returns

True if successfully parsed, false otherwise.

Definition at line 425 of file easylogging++.cc.

References ELPP_ASSERT, el::Configurations::setFromBase(), and el::Unknown.

9.45.2.7 parseLine()

```
bool el::Configurations::Parser::parseLine (
             std::string * line,
             std::string * currConfigStr,
             std::string * currLevelStr,
             Level * currLevel,
             Configurations * conf )  [static], [private]
```

Definition at line 476 of file easylogging++.cc.

References el::ConfigurationTypeHelper::convertFromString(), el::LevelHelper::convertFromString(), ELPP_ASSERT, el::Configurations::set(), el::base::utils::Str::toUpper(), el::base::utils::Str::trim(), and el::Unknown.

9.45.3 Friends And Related Symbol Documentation

9.45.3.1 el::Loggers

```
friend class el::Loggers  [friend]
```

Definition at line 1865 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.46 Json::Path Class Reference

Experimental and untested: represents a "path" to access a node.

`#include <value.h>`

Public Member Functions

- Path (const String &path, const PathArgument &a1=PathArgument(), const PathArgument &a2=PathArgument(), const PathArgument &a3=PathArgument(), const PathArgument &a4=PathArgument(), const PathArgument &a5=PathArgument())
- const Value & resolve (const Value &root) const
- Value resolve (const Value &root, const Value &defaultValue) const
- Value & make (Value &root) const

Private Types

- using InArgs = std::vector< const PathArgument * >
- using Args = std::vector< PathArgument >

Private Member Functions

- void makePath (const String &path, const InArgs &in)
- void addPathInArg (const String &path, const InArgs &in, InArgs::const_iterator &itInArg, PathArgument::Kind kind)

Static Private Member Functions

- static void invalidPath (const String &path, int location)

Private Attributes

- Args args_

9.46.1 Detailed Description

Experimental and untested: represents a "path" to access a node.

Syntax:

- "." => root node
- ".[n]" => elements at index 'n' of root node (an array value)
- ".name" => member named 'name' of root node (an object value)
- ".name1.name2.name3"
- ".[0][1][2].name1[3]"
- ".%" => member name is provided as parameter
- ".[%]" => index is provided as parameter

Definition at line 772 of file value.h.

9.46.2 Member Typedef Documentation

9.46.2.1 Args

```
using Json::Path::Args = std::vector<PathArgument>  [private]
```

Definition at line 788 of file value.h.

9.46.2.2 InArgs

```
using Json::Path::InArgs = std::vector<const PathArgument*>  [private]
```

Definition at line 787 of file value.h.

9.46.3 Constructor & Destructor Documentation

9.46.3.1 Path()

```
Json::Path::Path (
            const String & path,
            const PathArgument & a1 = PathArgument(),
            const PathArgument & a2 = PathArgument(),
            const PathArgument & a3 = PathArgument(),
            const PathArgument & a4 = PathArgument(),
            const PathArgument & a5 = PathArgument() )
```

9.46.4 Member Function Documentation

9.46.4.1 addPathInArg()

```
void Json::Path::addPathInArg (
            const String & path,
            const InArgs & in,
            InArgs::const_iterator & itInArg,
            PathArgument::Kind kind )  [private]
```

9.46.4.2 invalidPath()

```
static void Json::Path::invalidPath (
            const String & path,
            int location )  [static], [private]
```

9.46.4.3 make()

```
Value & Json::Path::make (
            Value & root ) const
```

Creates the "path" to access the specified node and returns a reference on the node.

9.46.4.4 makePath()

```
void Json::Path::makePath (
            const String & path,
            const InArgs & in )  [private]
```

9.46.4.5 resolve() [1/2]

```
const Value & Json::Path::resolve (
            const Value & root ) const
```

9.46.4.6 resolve() [2/2]

```
Value Json::Path::resolve (
            const Value & root,
            const Value & defaultValue ) const
```

9.46.5 Field Documentation

9.46.5.1 args_

```
Args Json::Path::args_  [private]
```

Definition at line 795 of file value.h.

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

- include/jsoncpp/value.h

9.47 Json::PathArgument Class Reference

Experimental and untested: represents an element of the "path" to access a node.

```
#include <value.h>
```

Public Member Functions

- PathArgument ()
- PathArgument (ArrayIndex index)
- PathArgument (const char *key)
- PathArgument (String key)

Private Types

- enum Kind { kindNone = 0 , kindIndex , kindKey }

Private Attributes

- String key_
- ArrayIndex index_ {}
- Kind kind_ {kindNone}

Friends

- class Path

9.47.1 Detailed Description

Experimental and untested: represents an element of the "path" to access a node.

Definition at line 745 of file value.h.

9.47.2 Member Enumeration Documentation

9.47.2.1 Kind

```
enum Json::PathArgument::Kind  [private]
```

Enumerator

kindNone	
kindIndex	
kindKey	

Definition at line 755 of file value.h.

9.47.3 Constructor & Destructor Documentation

9.47.3.1 PathArgument() [1/4]

```
Json::PathArgument::PathArgument ( )
```

9.47.3.2 PathArgument() [2/4]

```
Json::PathArgument::PathArgument (
            ArrayIndex index )
```

9.47.3.3 PathArgument() [3/4]

```
Json::PathArgument::PathArgument (
            const char * key )
```

9.47.3.4 PathArgument() [4/4]

```
Json::PathArgument::PathArgument (
            String key )
```

9.47.4 Friends And Related Symbol Documentation

9.47.4.1 Path

```
friend class Path  [friend]
```

Definition at line 747 of file value.h.

9.47.5 Field Documentation

9.47.5.1 index_

```
ArrayIndex Json::PathArgument::index_ {}  [private]
```

Definition at line 757 of file value.h.

9.47.5.2 key_

```
String Json::PathArgument::key_  [private]
```

Definition at line 756 of file value.h.

9.47.5.3 kind_

```
Kind Json::PathArgument::kind_ {kindNone}  [private]
```

Definition at line 758 of file value.h.

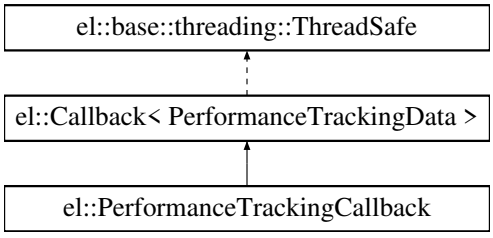
The documentation for this class was generated from the following file:

- include/jsoncpp/value.h

9.48 el::PerformanceTrackingCallback Class Reference

```
#include <easylogging++.h>
```

Inheritance diagram for el::PerformanceTrackingCallback:



Friends

- class base::PerformanceTracker

Additional Inherited Members

Public Member Functions inherited from el::Callback< PerformanceTrackingData >

- Callback (void)
- bool enabled (void) const
- void setEnabled (bool enabled)

Protected Member Functions inherited from el::Callback< PerformanceTrackingData >

- virtual void handle (const PerformanceTrackingData *handlePtr)=0

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

9.48.1 Detailed Description

Definition at line 2189 of file easylogging++.h.

9.48.2 Friends And Related Symbol Documentation

9.48.2.1 base::PerformanceTracker

```
friend class base::PerformanceTracker  [friend]
```

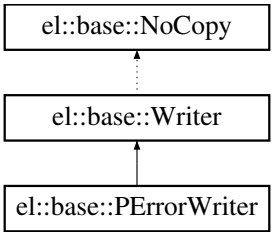
Definition at line 2191 of file easylogging++.h.

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

- include/easylogging++.h

9.49 el::base::PErrorWriter Class Reference

Inheritance diagram for el::base::PErrorWriter:



Public Member Functions

- PErrorWriter (Level level, const char ∗file, base::type::LineNumber line, const char ∗func, base::DispatchAction dispatchAction=base::DispatchAction::NormalLog, base::type::VerboseLevel verboseLevel=0)
- virtual ∼PErrorWriter (void)

Public Member Functions inherited from el::base::Writer

- Writer (Level level, const char ∗file, base::type::LineNumber line, const char ∗func, base::DispatchAction dispatchAction=base::DispatchAction::NormalLog, base::type::VerboseLevel verboseLevel=0)
- Writer (LogMessage ∗msg, base::DispatchAction dispatchAction=base::DispatchAction::NormalLog)
- virtual ∼Writer (void)
- template<typename T >
  Writer & operator<< (const T &log)
- Writer & operator<< (std::ostream &(∗log)(std::ostream &))
- operator bool ()
- Writer & construct (Logger ∗logger, bool needLock=true)
- Writer & construct (int count, const char ∗loggerIds,...)

Additional Inherited Members

Protected Member Functions inherited from el::base::Writer

- void initializeLogger (const std::string &loggerId, bool lookup=true, bool needLock=true)
- void processDispatch ()
- void triggerDispatch (void)

Protected Attributes inherited from el::base::Writer

- LogMessage ∗ m_msg
- Level m_level
- const char ∗ m_file
- const base::type::LineNumber m_line
- const char ∗ m_func
- base::type::VerboseLevel m_verboseLevel
- Logger ∗ m_logger
- bool m_proceed
- base::MessageBuilder m_messageBuilder
- base::DispatchAction m_dispatchAction
- std::vector< std::string > m_loggerIds

9.49.1 Detailed Description

Definition at line 3251 of file easylogging++.h.

9.49.2 Constructor & Destructor Documentation

9.49.2.1 PErrorWriter()

```
el::base::PErrorWriter::PErrorWriter (
             Level level,
             const char * file,
             base::type::LineNumber line,
             const char * func,
             base::DispatchAction dispatchAction = base::DispatchAction::NormalLog,
             base::type::VerboseLevel verboseLevel = 0 )  [inline]
```

Definition at line 3253 of file easylogging++.h.

9.49.2.2 ~PErrorWriter()

```
el::base::PErrorWriter::~PErrorWriter (
             void  )  [virtual]
```

Definition at line 2660 of file easylogging++.cc.

References el::base::Writer::m_logger, el::base::Writer::m_proceed, and el::Logger::stream().

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

- include/easylogging++.h
- lib/easylogging++.cc

9.50 el::base::HitCounter::Predicate Class Reference

```
#include <easylogging++.h>
```

Public Member Functions

- Predicate (const char *filename, base::type::LineNumber lineNumber)
- bool operator() (const HitCounter *counter)

Private Attributes

- const char * m_filename
- base::type::LineNumber m_lineNumber

9.50.1 Detailed Description

Definition at line 2095 of file easylogging++.h.

9.50.2 Constructor & Destructor Documentation

9.50.2.1 Predicate()

```
el::base::HitCounter::Predicate::Predicate (
            const char * filename,
            base::type::LineNumber lineNumber )  [inline]
```

Definition at line 2097 of file easylogging++.h.

9.50.3 Member Function Documentation

9.50.3.1 operator()()

```
bool el::base::HitCounter::Predicate::operator() (
            const HitCounter * counter )  [inline]
```

Definition at line 2101 of file easylogging++.h.

References el::base::HitCounter::m_filename, and el::base::HitCounter::m_lineNumber.

9.50.4 Field Documentation

9.50.4.1 m_filename

```
const char* el::base::HitCounter::Predicate::m_filename  [private]
```

Definition at line 2108 of file easylogging++.h.

9.50.4.2 m_lineNumber

```
base::type::LineNumber el::base::HitCounter::Predicate::m_lineNumber  [private]
```

Definition at line 2109 of file easylogging++.h.

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

- include/easylogging++.h

9.51 el::Configuration::Predicate Class Reference

Used to find configuration from configuration (pointers) repository. Avoid using it.

```
#include <easylogging++.h>
```

Public Member Functions

- Predicate (Level level, ConfigurationType configurationType)

  Used to find configuration from configuration (pointers) repository. Avoid using it.
- bool operator() (const Configuration *conf) const

Private Attributes

- Level m_level
- ConfigurationType m_configurationType

9.51.1 Detailed Description

Used to find configuration from configuration (pointers) repository. Avoid using it.

Definition at line 1709 of file easylogging++.h.

9.51.2 Constructor & Destructor Documentation

9.51.2.1 Predicate()

```
el::Configuration::Predicate::Predicate (
            Level level,
            ConfigurationType configurationType )
```

Used to find configuration from configuration (pointers) repository. Avoid using it.

Definition at line 264 of file easylogging++.cc.

9.51.3 Member Function Documentation

9.51.3.1 operator()()

```
bool el::Configuration::Predicate::operator() (
            const Configuration * conf ) const
```

Definition at line 269 of file easylogging++.cc.

References el::Configuration::configurationType(), el::Configuration::level(), el::Configuration::m_configurationType, and el::Configuration::m_level.

9.51.4 Field Documentation

9.51.4.1 m_configurationType

```
ConfigurationType el::Configuration::Predicate::m_configurationType  [private]
```

Definition at line 1717 of file easylogging++.h.

9.51.4.2 m_level

```
Level el::Configuration::Predicate::m_level  [private]
```

Definition at line 1716 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.52 Json::Reader Class Reference

Unserialize a JSON document into a Value.

```
#include <reader.h>
```

Data Structures

- class ErrorInfo
- struct StructuredError
  An error tagged with where in the JSON text it was encountered.
- class Token

Public Types

- using Char = char
- using Location = const Char *

Public Member Functions

- Reader ()
  Constructs a Reader allowing all features for parsing.
- Reader (const Features &features)
  Constructs a Reader allowing the specified feature set for parsing.
- bool parse (const std::string &document, Value &root, bool collectComments=true)
  Read a Value from a JSON document.
- bool parse (const char *beginDoc, const char *endDoc, Value &root, bool collectComments=true)
  Read a Value from a JSON document.
- bool parse (IStream &is, Value &root, bool collectComments=true)
  Parse from input stream.
- String getFormatedErrorMessages () const
  Returns a user friendly string that list errors in the parsed document.
- String getFormattedErrorMessages () const
  Returns a user friendly string that list errors in the parsed document.
- std::vector< StructuredError > getStructuredErrors () const
  Returns a vector of structured errors encountered while parsing.
- bool pushError (const Value &value, const String &message)
  Add a semantic error message.
- bool pushError (const Value &value, const String &message, const Value &extra)
  Add a semantic error message with extra context.
- bool good () const
  Return whether there are any errors.

Private Types

- enum TokenType {
  tokenEndOfStream = 0 , tokenObjectBegin , tokenObjectEnd , tokenArrayBegin ,
  tokenArrayEnd , tokenString , tokenNumber , tokenTrue ,
  tokenFalse , tokenNull , tokenArraySeparator , tokenMemberSeparator ,
  tokenComment , tokenError }
- using Errors = std::deque< ErrorInfo >
- using Nodes = std::stack< Value * >

Private Member Functions

- bool readToken (Token &token)
- void skipSpaces ()
- bool match (const Char *pattern, int patternLength)
- bool readComment ()
- bool readCStyleComment ()
- bool readCppStyleComment ()
- bool readString ()
- void readNumber ()
- bool readValue ()
- bool readObject (Token &token)
- bool readArray (Token &token)
- bool decodeNumber (Token &token)
- bool decodeNumber (Token &token, Value &decoded)
- bool decodeString (Token &token)
- bool decodeString (Token &token, String &decoded)
- bool decodeDouble (Token &token)
- bool decodeDouble (Token &token, Value &decoded)
- bool decodeUnicodeCodePoint (Token &token, Location &current, Location end, unsigned int &unicode)
- bool decodeUnicodeEscapeSequence (Token &token, Location &current, Location end, unsigned int &unicode)
- bool addError (const String &message, Token &token, Location extra=nullptr)
- bool recoverFromError (TokenType skipUntilToken)
- bool addErrorAndRecover (const String &message, Token &token, TokenType skipUntilToken)
- void skipUntilSpace ()
- Value & currentValue ()
- Char getNextChar ()
- void getLocationLineAndColumn (Location location, int &line, int &column) const
- String getLocationLineAndColumn (Location location) const
- void addComment (Location begin, Location end, CommentPlacement placement)
- void skipCommentTokens (Token &token)

Static Private Member Functions

- static bool containsNewLine (Location begin, Location end)
- static String normalizeEOL (Location begin, Location end)

Private Attributes

- Nodes nodes_
- Errors errors_
- String document_
- Location begin_ {}
- Location end_ {}
- Location current_ {}
- Location lastValueEnd_ {}
- Value * lastValue_ {}
- String commentsBefore_
- Features features_
- bool collectComments_ {}

9.52.1 Detailed Description

Unserialize a JSON document into a Value.

Deprecated Use CharReader and CharReaderBuilder.

Definition at line 37 of file reader.h.

9.52.2 Member Typedef Documentation

9.52.2.1 Char

```
using Json::Reader::Char = char
```

Definition at line 39 of file reader.h.

9.52.2.2 Errors

```
using Json::Reader::Errors = std::deque<ErrorInfo>  [private]
```

Definition at line 190 of file reader.h.

9.52.2.3 Location

```
using Json::Reader::Location = const Char*
```

Definition at line 40 of file reader.h.

9.52.2.4 Nodes

```
using Json::Reader::Nodes = std::stack<Value*>  [private]
```

Definition at line 229 of file reader.h.

9.52.3 Member Enumeration Documentation

9.52.3.1 TokenType

```
enum Json::Reader::TokenType  [private]
```

Enumerator

tokenEndOfStream	
tokenObjectBegin	
tokenObjectEnd	
tokenArrayBegin	
tokenArrayEnd	
tokenString	
tokenNumber	
tokenTrue	
tokenFalse	
tokenNull	
tokenArraySeparator	
tokenMemberSeparator	
tokenComment	
tokenError	

Definition at line 159 of file reader.h.

9.52.4 Constructor & Destructor Documentation

9.52.4.1 Reader() [1/2]

```
Json::Reader::Reader ( )
```

Constructs a Reader allowing all features for parsing.

Deprecated Use CharReader and CharReaderBuilder.

9.52.4.2 Reader() [2/2]

```
Json::Reader::Reader (
            const Features & features )
```

Constructs a Reader allowing the specified feature set for parsing.

Deprecated Use CharReader and CharReaderBuilder.

9.52.5 Member Function Documentation

9.52.5.1 addComment()

```
void Json::Reader::addComment (
            Location begin,
            Location end,
            CommentPlacement placement )  [private]
```

9.52.5.2 addError()

```
bool Json::Reader::addError (
            const String & message,
            Token & token,
            Location extra = nullptr )  [private]
```

9.52.5.3 addErrorAndRecover()

```
bool Json::Reader::addErrorAndRecover (
            const String & message,
            Token & token,
            TokenType skipUntilToken )  [private]
```

9.52.5.4 containsNewLine()

```
static bool Json::Reader::containsNewLine (
            Location begin,
            Location end )  [static], [private]
```

9.52.5.5 currentValue()

```
Value & Json::Reader::currentValue ( )  [private]
```

9.52.5.6 decodeDouble() [1/2]

```
bool Json::Reader::decodeDouble (
            Token & token )  [private]
```

9.52.5.7 decodeDouble() [2/2]

```
bool Json::Reader::decodeDouble (
            Token & token,
            Value & decoded )  [private]
```

9.52.5.8 decodeNumber() [1/2]

```
bool Json::Reader::decodeNumber (
            Token & token )  [private]
```

9.52.5.9 decodeNumber() [2/2]

```
bool Json::Reader::decodeNumber (
            Token & token,
            Value & decoded )  [private]
```

9.52.5.10 decodeString() [1/2]

```
bool Json::Reader::decodeString (
            Token & token )  [private]
```

9.52.5.11 decodeString() [2/2]

```
bool Json::Reader::decodeString (
            Token & token,
            String & decoded )  [private]
```

9.52.5.12 decodeUnicodeCodePoint()

```
bool Json::Reader::decodeUnicodeCodePoint (
            Token & token,
            Location & current,
            Location end,
            unsigned int & unicode )  [private]
```

9.52.5.13 decodeUnicodeEscapeSequence()

```
bool Json::Reader::decodeUnicodeEscapeSequence (
            Token & token,
            Location & current,
            Location end,
            unsigned int & unicode )  [private]
```

9.52.5.14 getFormatedErrorMessages()

```
String Json::Reader::getFormatedErrorMessages ( ) const
```

Returns a user friendly string that list errors in the parsed document.

Returns

Formatted error message with the list of errors with their location in the parsed document. An empty string is returned if no error occurred during parsing.

Deprecated Use getFormattedErrorMessages() instead (typo fix).

9.52.5.15 getFormattedErrorMessages()

```
String Json::Reader::getFormattedErrorMessages ( ) const
```

Returns a user friendly string that list errors in the parsed document.

Returns

Formatted error message with the list of errors with their location in the parsed document. An empty string is returned if no error occurred during parsing.

9.52.5.16 getLocationLineAndColumn() [1/2]

```
String Json::Reader::getLocationLineAndColumn (
            Location location ) const  [private]
```

9.52.5.17 getLocationLineAndColumn() [2/2]

```
void Json::Reader::getLocationLineAndColumn (
            Location location,
            int & line,
            int & column ) const  [private]
```

9.52.5.18 getNextChar()

```
Char Json::Reader::getNextChar ( )  [private]
```

9.52.5.19 getStructuredErrors()

```
std::vector< StructuredError > Json::Reader::getStructuredErrors ( ) const
```

Returns a vector of structured errors encountered while parsing.

Returns

A (possibly empty) vector of StructuredError objects. Currently only one error can be returned, but the caller should tolerate multiple errors. This can occur if the parser recovers from a non-fatal parse error and then encounters additional errors.

9.52.5.20 good()

```
bool Json::Reader::good ( ) const
```

Return whether there are any errors.

Returns

`true` if there are no errors to report `false` if errors have occurred.

9.52.5.21 match()

```
bool Json::Reader::match (
            const Char * pattern,
            int patternLength )  [private]
```

9.52.5.22 normalizeEOL()

```
static String Json::Reader::normalizeEOL (
            Location begin,
            Location end )  [static], [private]
```

9.52.5.23 parse() [1/3]

```
bool Json::Reader::parse (
            const char * beginDoc,
            const char * endDoc,
            Value & root,
            bool collectComments = true )
```

Read a Value from a JSON document.

Parameters

	beginDoc	Pointer on the beginning of the UTF-8 encoded string of the document to read.
	endDoc	Pointer on the end of the UTF-8 encoded string of the document to read. Must be >= beginDoc.
out	*root*	Contains the root value of the document if it was successfully parsed.
	collectComments	`true` to collect comment and allow writing them back during serialization, `false` to discard comments. This parameter is ignored if Features::allowComments_ is `false`.

Returns

`true` if the document was successfully parsed, `false` if an error occurred.

9.52.5.24 parse() [2/3]

```
bool Json::Reader::parse (
            const std::string & document,
            Value & root,
            bool collectComments = true )
```

Read a Value from a JSON document.

Parameters

	document	UTF-8 encoded string containing the document to read.
out	*root*	Contains the root value of the document if it was successfully parsed.
	collectComments	`true` to collect comment and allow writing them back during serialization, `false` to discard comments. This parameter is ignored if Features::allowComments_ is `false`.

Returns

`true` if the document was successfully parsed, `false` if an error occurred.

9.52.5.25 parse() [3/3]

```
bool Json::Reader::parse (
            IStream & is,
            Value & root,
            bool collectComments = true )
```

Parse from input stream.

See also

Json::operator>>(std::istream&, Json::Value&).

9.52.5.26 pushError() [1/2]

```
bool Json::Reader::pushError (
            const Value & value,
            const String & message )
```

Add a semantic error message.

Parameters

value	JSON Value location associated with the error
message	The error message.

Returns

`true` if the error was successfully added, `false` if the Value offset exceeds the document size.

9.52.5.27 pushError() [2/2]

```
bool Json::Reader::pushError (
            const Value & value,
            const String & message,
            const Value & extra )
```

Add a semantic error message with extra context.

Parameters

value	JSON Value location associated with the error
message	The error message.
extra	Additional JSON Value location to contextualize the error

Returns

`true` if the error was successfully added, `false` if either Value offset exceeds the document size.

9.52.5.28 readArray()

```
bool Json::Reader::readArray (
            Token & token )  [private]
```

9.52.5.29 readComment()

```
bool Json::Reader::readComment ( )  [private]
```

9.52.5.30 readCppStyleComment()

```
bool Json::Reader::readCppStyleComment ( )  [private]
```

9.52.5.31 readCStyleComment()

```
bool Json::Reader::readCStyleComment ( )  [private]
```

9.52.5.32 readNumber()

```
void Json::Reader::readNumber ( )  [private]
```

9.52.5.33 readObject()

```
bool Json::Reader::readObject (
            Token & token )  [private]
```

9.52.5.34 readString()

```
bool Json::Reader::readString ( )  [private]
```

9.52.5.35 readToken()

```
bool Json::Reader::readToken (
            Token & token )  [private]
```

9.52.5.36 readValue()

```
bool Json::Reader::readValue ( )  [private]
```

9.52.5.37 recoverFromError()

```
bool Json::Reader::recoverFromError (
            TokenType skipUntilToken )  [private]
```

9.52.5.38 skipCommentTokens()

```
void Json::Reader::skipCommentTokens (
            Token & token )  [private]
```

9.52.5.39 skipSpaces()

```
void Json::Reader::skipSpaces ( )  [private]
```

9.52.5.40 skipUntilSpace()

```
void Json::Reader::skipUntilSpace ( )  [private]
```

9.52.6 Field Documentation

9.52.6.1 begin_

```
Location Json::Reader::begin_ {}  [private]
```

Definition at line 233 of file reader.h.

9.52.6.2 collectComments_

```
bool Json::Reader::collectComments_ {}  [private]
```

Definition at line 240 of file reader.h.

9.52.6.3 commentsBefore_

```
String Json::Reader::commentsBefore_  [private]
```

Definition at line 238 of file reader.h.

9.52.6.4 current_

```
Location Json::Reader::current_ {}  [private]
```

Definition at line 235 of file reader.h.

9.52.6.5 document_

```
String Json::Reader::document_  [private]
```

Definition at line 232 of file reader.h.

9.52.6.6 end_

```
Location Json::Reader::end_ {}  [private]
```

Definition at line 234 of file reader.h.

9.52.6.7 errors_

```
Errors Json::Reader::errors_  [private]
```

Definition at line 231 of file reader.h.

9.52.6.8 features_

```
Features Json::Reader::features_  [private]
```

Definition at line 239 of file reader.h.

9.52.6.9 lastValue_

```
Value* Json::Reader::lastValue_ {}  [private]
```

Definition at line 237 of file reader.h.

9.52.6.10 lastValueEnd_

```
Location Json::Reader::lastValueEnd_ {}  [private]
```

Definition at line 236 of file reader.h.

9.52.6.11 nodes_

```
Nodes Json::Reader::nodes_  [private]
```

Definition at line 230 of file reader.h.

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

- include/jsoncpp/reader.h

9.53 Json::SecureAllocator< T >::rebind< U > Struct Template Reference

`#include <allocator.h>`

Public Types

- using other = SecureAllocator< U >

9.53.1 Detailed Description

template<typename T>
template<typename U>
struct Json::SecureAllocator< T >::rebind< U >

Definition at line 78 of file allocator.h.

9.53.2 Member Typedef Documentation

9.53.2.1 other

```
template<typename T >
template<typename U >
using Json::SecureAllocator< T >::rebind< U >::other = SecureAllocator<U>
```

Definition at line 79 of file allocator.h.

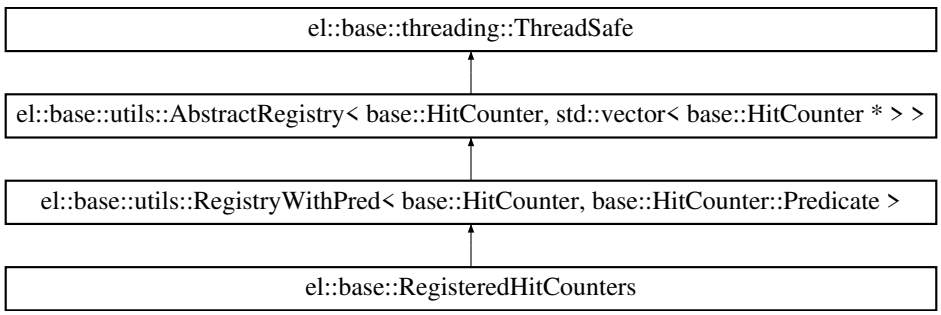
The documentation for this struct was generated from the following file:

- include/jsoncpp/allocator.h

9.54 el::base::RegisteredHitCounters Class Reference

Repository for hit counters used across the application.

Inheritance diagram for el::base::RegisteredHitCounters:



Public Member Functions

- bool validateEveryN (const char *filename, base::type::LineNumber lineNumber, std::size_t n)

  Validates counter for every N, i.e, registers new if does not exist otherwise updates original one.
- bool validateAfterN (const char *filename, base::type::LineNumber lineNumber, std::size_t n)

  Validates counter for hits >= N, i.e, registers new if does not exist otherwise updates original one.
- bool validateNTimes (const char *filename, base::type::LineNumber lineNumber, std::size_t n)

  Validates counter for hits are <= n, i.e, registers new if does not exist otherwise updates original one.
- const base::HitCounter * getCounter (const char *filename, base::type::LineNumber lineNumber)

  Gets hit counter registered at specified position.

Public Member Functions inherited from el::base::utils::RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >

- RegistryWithPred (void)
- RegistryWithPred (const RegistryWithPred &sr)

  Copy constructor that is useful for base classes. Try to avoid this constructor, use move constructor.
- virtual ~RegistryWithPred (void)
- RegistryWithPred & operator= (const RegistryWithPred &sr)

  Assignment operator that unregisters all the existing registries and deeply copies each of repo element.

Public Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- AbstractRegistry (void)

  Default constructor.
- AbstractRegistry (AbstractRegistry &&sr)

  Move constructor that is useful for base classes.
- bool operator== (const AbstractRegistry< T_Ptr, Container > &other)
- bool operator!= (const AbstractRegistry< T_Ptr, Container > &other)
- AbstractRegistry & operator= (AbstractRegistry &&sr)

  Assignment move operator.
- virtual ~AbstractRegistry (void)
- virtual iterator begin (void) ELPP_FINAL
- virtual iterator end (void) ELPP_FINAL
- virtual const_iterator cbegin (void) const ELPP_FINAL
- virtual const_iterator cend (void) const ELPP_FINAL
- virtual bool empty (void) const ELPP_FINAL
- virtual std::size_t size (void) const ELPP_FINAL
- virtual Container & list (void) ELPP_FINAL

  Returns underlying container by reference.
- virtual const Container & list (void) const ELPP_FINAL

  Returns underlying container by constant reference.

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Additional Inherited Members

Public Types inherited from el::base::utils::RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >

- typedef RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >::iterator iterator
- typedef RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >::const_iterator const_iterator

Public Types inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- typedef Container::iterator iterator
- typedef Container::const_iterator const_iterator

Protected Member Functions inherited from el::base::utils::RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >

- virtual void unregisterAll (void) ELPP_FINAL

  Unregisters all the pointers from current repository.
- virtual void unregister (base::HitCounter *&ptr) ELPP_FINAL
- virtual void registerNew (base::HitCounter *ptr) ELPP_FINAL
- base::HitCounter * get (const T &arg1, const T2 arg2)

  Gets pointer from repository with specified arguments. Arguments are passed to predicate in order to validate pointer.

Protected Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- virtual void deepCopy (const AbstractRegistry< T_Ptr, Container > &)=0
- void reinitDeepCopy (const AbstractRegistry< T_Ptr, Container > &sr)

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

9.54.1 Detailed Description

Repository for hit counters used across the application.

Definition at line 2118 of file easylogging++.h.

9.54.2 Member Function Documentation

9.54.2.1 getCounter()

```
const base::HitCounter * el::base::RegisteredHitCounters::getCounter (
            const char * filename,
            base::type::LineNumber lineNumber )  [inline]
```

Gets hit counter registered at specified position.

Definition at line 2133 of file easylogging++.h.

9.54.2.2 validateAfterN()

```
bool el::base::RegisteredHitCounters::validateAfterN (
            const char * filename,
            base::type::LineNumber lineNumber,
            std::size_t n )
```

Validates counter for hits >= N, i.e, registers new if does not exist otherwise updates original one.

Returns

True if validation resulted in triggering hit. Meaning logs should be written everytime true is returned

Definition at line 1849 of file easylogging++.cc.

References el::base::utils::RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >::get(), el::base::HitCounter::hitCounts
el::base::HitCounter::increment(), el::base::threading::ThreadSafe::lock(), and el::base::utils::RegistryWithPred< base::HitCounter, ba

9.54.2.3 validateEveryN()

```
bool el::base::RegisteredHitCounters::validateEveryN (
            const char * filename,
            base::type::LineNumber lineNumber,
            std::size_t n )
```

Validates counter for every N, i.e, registers new if does not exist otherwise updates original one.

Returns

True if validation resulted in triggering hit. Meaning logs should be written everytime true is returned

Definition at line 1836 of file easylogging++.cc.

References el::base::utils::RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >::get(), el::base::HitCounter::hitCounts
el::base::threading::ThreadSafe::lock(), el::base::utils::RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >::registerN
and el::base::HitCounter::validateHitCounts().

9.54.2.4 validateNTimes()

```
bool el::base::RegisteredHitCounters::validateNTimes (
            const char * filename,
            base::type::LineNumber lineNumber,
            std::size_t n )
```

Validates counter for hits are <= n, i.e, registers new if does not exist otherwise updates original one.

Returns

True if validation resulted in triggering hit. Meaning logs should be written everytime true is returned

Definition at line 1866 of file easylogging++.cc.

References el::base::utils::RegistryWithPred< base::HitCounter, base::HitCounter::Predicate >::get(), el::base::HitCounter::hitCounts
el::base::HitCounter::increment(), el::base::threading::ThreadSafe::lock(), and el::base::utils::RegistryWithPred< base::HitCounter, ba

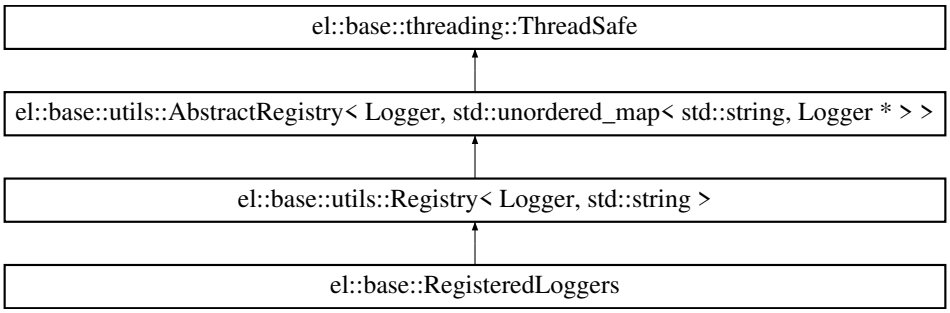
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.55 el::base::RegisteredLoggers Class Reference

Loggers repository.

Inheritance diagram for el::base::RegisteredLoggers:



Public Member Functions

- RegisteredLoggers (const LogBuilderPtr &defaultLogBuilder)
- virtual ~RegisteredLoggers (void)
- void setDefaultConfigurations (const Configurations &configurations)
- Configurations * defaultConfigurations (void)
- Logger * get (const std::string &id, bool forceCreation=true)
- template<typename T >
  bool installLoggerRegistrationCallback (const std::string &id)
- template<typename T >
  void uninstallLoggerRegistrationCallback (const std::string &id)
- template<typename T >
  T * loggerRegistrationCallback (const std::string &id)
- bool remove (const std::string &id)
- bool has (const std::string &id)
- void unregister (Logger *&logger)
- LogStreamsReferenceMapPtr logStreamsReference (void)
- void flushAll (void)
- void setDefaultLogBuilder (LogBuilderPtr &logBuilderPtr)

Public Member Functions inherited from el::base::utils::Registry< Logger, std::string >

- Registry (void)
- Registry (const Registry &sr)

  Copy constructor that is useful for base classes. Try to avoid this constructor, use move constructor.
- Registry & operator= (const Registry &sr)

  Assignment operator that unregisters all the existing registries and deeply copies each of repo element.
- virtual ~Registry (void)

Public Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- AbstractRegistry (void)

  Default constructor.
- AbstractRegistry (AbstractRegistry &&sr)

  Move constructor that is useful for base classes.
- bool operator== (const AbstractRegistry< T_Ptr, Container > &other)
- bool operator!= (const AbstractRegistry< T_Ptr, Container > &other)
- AbstractRegistry & operator= (AbstractRegistry &&sr)

  Assignment move operator.
- virtual ~AbstractRegistry (void)
- virtual iterator begin (void) ELPP_FINAL
- virtual iterator end (void) ELPP_FINAL
- virtual const_iterator cbegin (void) const ELPP_FINAL
- virtual const_iterator cend (void) const ELPP_FINAL
- virtual bool empty (void) const ELPP_FINAL
- virtual std::size_t size (void) const ELPP_FINAL
- virtual Container & list (void) ELPP_FINAL

  Returns underlying container by reference.
- virtual const Container & list (void) const ELPP_FINAL

  Returns underlying container by constant reference.

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Private Member Functions

- void unsafeFlushAll (void)

Private Attributes

- LogBuilderPtr m_defaultLogBuilder
- Configurations m_defaultConfigurations
- base::LogStreamsReferenceMapPtr m_logStreamsReference = nullptr
- std::unordered_map< std::string, base::type::LoggerRegistrationCallbackPtr > m_loggerRegistrationCallbacks

Friends

- class el::base::Storage

Additional Inherited Members

Public Types inherited from el::base::utils::Registry< Logger, std::string >

- typedef Registry< Logger, std::string >::iterator iterator
- typedef Registry< Logger, std::string >::const_iterator const_iterator

Public Types inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- typedef Container::iterator iterator
- typedef Container::const_iterator const_iterator

Protected Member Functions inherited from el::base::utils::Registry< Logger, std::string >

- virtual void unregisterAll (void) ELPP_FINAL

  Unregisters all the pointers from current repository.
- virtual void registerNew (const std::string &uniqKey, Logger *ptr) ELPP_FINAL

  Registers new registry to repository.
- void unregister (const std::string &uniqKey)

  Unregisters single entry mapped to specified unique key.
- Logger * get (const std::string &uniqKey)

  Gets pointer from repository. If none found, nullptr is returned.

Protected Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- virtual void deepCopy (const AbstractRegistry< T_Ptr, Container > &)=0
- void reinitDeepCopy (const AbstractRegistry< T_Ptr, Container > &sr)

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

9.55.1 Detailed Description

Loggers repository.

Definition at line 2347 of file easylogging++.h.

9.55.2 Constructor & Destructor Documentation

9.55.2.1 RegisteredLoggers()

```
el::base::RegisteredLoggers::RegisteredLoggers (
            const LogBuilderPtr & defaultLogBuilder )  [explicit]
```

Definition at line 1881 of file easylogging++.cc.

References m_defaultConfigurations, m_logStreamsReference, and el::Configurations::setToDefault().

9.55.2.2 ~RegisteredLoggers()

```
virtual el::base::RegisteredLoggers::~RegisteredLoggers (
            void  )  [inline], [virtual]
```

Definition at line 2351 of file easylogging++.h.

9.55.3 Member Function Documentation

9.55.3.1 defaultConfigurations()

```
Configurations * el::base::RegisteredLoggers::defaultConfigurations (
            void  )  [inline]
```

Definition at line 2360 of file easylogging++.h.

9.55.3.2 flushAll()

```
void el::base::RegisteredLoggers::flushAll (
            void  )  [inline]
```

Definition at line 2397 of file easylogging++.h.

9.55.3.3 get()

```
Logger * el::base::RegisteredLoggers::get (
            const std::string & id,
            bool forceCreation = true )
```

Definition at line 1887 of file easylogging++.cc.

References ELPP_ASSERT, el::Callback< T >::enabled(), el::base::utils::Registry< T_Ptr, T_Key >::get(), el::Callback< T >::handle(), el::Logger::isValidId(), el::base::threading::ThreadSafe::lock(), m_defaultConfigurations, m_defaultLogBuilder, el::Logger::m_logBuilder, m_loggerRegistrationCallbacks, m_logStreamsReference, and el::base::utils::Registry< Logger, std::string >::registerNew().

9.55.3.4 has()

```
bool el::base::RegisteredLoggers::has (
            const std::string & id )  [inline]
```

Definition at line 2384 of file easylogging++.h.

9.55.3.5 installLoggerRegistrationCallback()

```
template<typename T >
bool el::base::RegisteredLoggers::installLoggerRegistrationCallback (
            const std::string & id )  [inline]
```

Definition at line 2367 of file easylogging++.h.

9.55.3.6 loggerRegistrationCallback()

```
template<typename T >
T * el::base::RegisteredLoggers::loggerRegistrationCallback (
            const std::string & id )  [inline]
```

Definition at line 2378 of file easylogging++.h.

9.55.3.7 logStreamsReference()

```
LogStreamsReferenceMapPtr el::base::RegisteredLoggers::logStreamsReference (
            void  )  [inline]
```

Definition at line 2393 of file easylogging++.h.

9.55.3.8 remove()

```
bool el::base::RegisteredLoggers::remove (
            const std::string & id )
```

Definition at line 1911 of file easylogging++.cc.

References el::base::utils::Registry< T_Ptr, T_Key >::get(), el::base::consts::kDefaultLoggerId, and unregister().

9.55.3.9 setDefaultConfigurations()

```
void el::base::RegisteredLoggers::setDefaultConfigurations (
            const Configurations & configurations )  [inline]
```

Definition at line 2355 of file easylogging++.h.

9.55.3.10 setDefaultLogBuilder()

```
void el::base::RegisteredLoggers::setDefaultLogBuilder (
            LogBuilderPtr & logBuilderPtr )  [inline]
```

Definition at line 2402 of file easylogging++.h.

9.55.3.11 uninstallLoggerRegistrationCallback()

```
template<typename T >
void el::base::RegisteredLoggers::uninstallLoggerRegistrationCallback (
            const std::string & id )  [inline]
```

Definition at line 2373 of file easylogging++.h.

9.55.3.12 unregister()

```
void el::base::RegisteredLoggers::unregister (
            Logger *& logger )  [inline]
```

Definition at line 2388 of file easylogging++.h.

References el::Logger::id().

9.55.3.13 unsafeFlushAll()

```
void el::base::RegisteredLoggers::unsafeFlushAll (
            void  )  [private]
```

Definition at line 1924 of file easylogging++.cc.

References ELPP_INTERNAL_INFO, and m_logStreamsReference.

9.55.4 Friends And Related Symbol Documentation

9.55.4.1 el::base::Storage

```
friend class el::base::Storage  [friend]
```

Definition at line 2412 of file easylogging++.h.

9.55.5 Field Documentation

9.55.5.1 m_defaultConfigurations

```
Configurations el::base::RegisteredLoggers::m_defaultConfigurations  [private]
```

Definition at line 2409 of file easylogging++.h.

9.55.5.2 m_defaultLogBuilder

```
LogBuilderPtr el::base::RegisteredLoggers::m_defaultLogBuilder  [private]
```

Definition at line 2408 of file easylogging++.h.

9.55.5.3 m_loggerRegistrationCallbacks

```
std::unordered_map<std::string, base::type::LoggerRegistrationCallbackPtr> el::base::Registered↩
Loggers::m_loggerRegistrationCallbacks  [private]
```

Definition at line 2411 of file easylogging++.h.

9.55.5.4 m_logStreamsReference

```
base::LogStreamsReferenceMapPtr el::base::RegisteredLoggers::m_logStreamsReference = nullptr
[private]
```

Definition at line 2410 of file easylogging++.h.

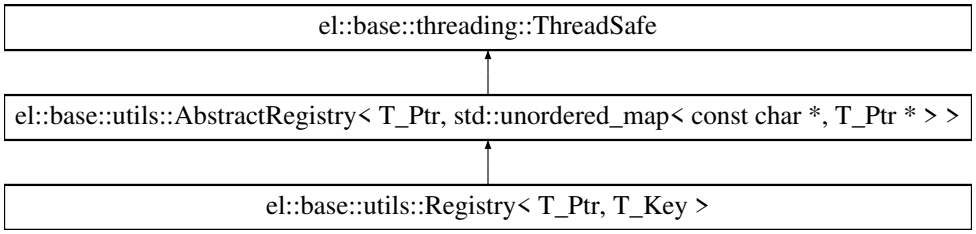
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.56 el::base::utils::Registry< T_Ptr, T_Key > Class Template Reference

A pointer registry mechanism to manage memory and provide search functionalities. (non-predicate version)

Inheritance diagram for el::base::utils::Registry< T_Ptr, T_Key >:



Public Types

- typedef Registry< T_Ptr, T_Key >::iterator iterator
- typedef Registry< T_Ptr, T_Key >::const_iterator const_iterator

Public Types inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- typedef Container::iterator iterator
- typedef Container::const_iterator const_iterator

Public Member Functions

- Registry (void)
- Registry (const Registry &sr)

  Copy constructor that is useful for base classes. Try to avoid this constructor, use move constructor.
- Registry & operator= (const Registry &sr)

  Assignment operator that unregisters all the existing registries and deeply copies each of repo element.
- virtual ~Registry (void)

Public Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- AbstractRegistry (void)

  Default constructor.
- AbstractRegistry (AbstractRegistry &&sr)

  Move constructor that is useful for base classes.
- bool operator== (const AbstractRegistry< T_Ptr, Container > &other)
- bool operator!= (const AbstractRegistry< T_Ptr, Container > &other)
- AbstractRegistry & operator= (AbstractRegistry &&sr)

  Assignment move operator.
- virtual ~AbstractRegistry (void)
- virtual iterator begin (void) ELPP_FINAL
- virtual iterator end (void) ELPP_FINAL
- virtual const_iterator cbegin (void) const ELPP_FINAL
- virtual const_iterator cend (void) const ELPP_FINAL
- virtual bool empty (void) const ELPP_FINAL
- virtual std::size_t size (void) const ELPP_FINAL
- virtual Container & list (void) ELPP_FINAL

  Returns underlying container by reference.
- virtual const Container & list (void) const ELPP_FINAL

  Returns underlying container by constant reference.

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Protected Member Functions

- virtual void unregisterAll (void) ELPP_FINAL

  Unregisters all the pointers from current repository.
- virtual void registerNew (const T_Key &uniqKey, T_Ptr *ptr) ELPP_FINAL

  Registers new registry to repository.
- void unregister (const T_Key &uniqKey)

  Unregisters single entry mapped to specified unique key.
- T_Ptr * get (const T_Key &uniqKey)

  Gets pointer from repository. If none found, nullptr is returned.

Protected Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, Container >

- virtual void deepCopy (const AbstractRegistry< T_Ptr, Container > &)=0
- void reinitDeepCopy (const AbstractRegistry< T_Ptr, Container > &sr)

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

Private Member Functions

- virtual void deepCopy (const AbstractRegistry< T_Ptr, std::unordered_map< T_Key, T_Ptr * > > &sr) ELPP_FINAL

9.56.1 Detailed Description

template<typename T_Ptr, typename T_Key = const char*>
class el::base::utils::Registry< T_Ptr, T_Key >

A pointer registry mechanism to manage memory and provide search functionalities. (non-predicate version)

@detail NOTE: This is thread-unsafe implementation (although it contains lock function, it does not use these functions) of AbstractRegistry<T_Ptr, Container>. Any implementation of this class should be explicitly (by using lock functions)

Definition at line 1370 of file easylogging++.h.

9.56.2 Member Typedef Documentation

9.56.2.1 const_iterator

```
template<typename T_Ptr , typename T_Key = const char*>
typedef Registry<T_Ptr,T_Key>::const_iterator el::base::utils::Registry< T_Ptr, T_Key >↩
::const_iterator
```

Definition at line 1373 of file easylogging++.h.

9.56.2.2 iterator

```
template<typename T_Ptr , typename T_Key = const char*>
typedef Registry<T_Ptr,T_Key>::iterator el::base::utils::Registry< T_Ptr, T_Key >::iterator
```

Definition at line 1372 of file easylogging++.h.

9.56.3 Constructor & Destructor Documentation

9.56.3.1 Registry() [1/2]

```
template<typename T_Ptr , typename T_Key = const char*>
el::base::utils::Registry< T_Ptr, T_Key >::Registry (
            void  )  [inline]
```

Definition at line 1375 of file easylogging++.h.

9.56.3.2 Registry() [2/2]

```
template<typename T_Ptr , typename T_Key = const char*>
el::base::utils::Registry< T_Ptr, T_Key >::Registry (
            const Registry< T_Ptr, T_Key > & sr )  [inline]
```

Copy constructor that is useful for base classes. Try to avoid this constructor, use move constructor.

Definition at line 1378 of file easylogging++.h.

9.56.3.3 ~Registry()

```
template<typename T_Ptr , typename T_Key = const char*>
virtual el::base::utils::Registry< T_Ptr, T_Key >::~Registry (
            void  )  [inline], [virtual]
```

Definition at line 1396 of file easylogging++.h.

9.56.4 Member Function Documentation

9.56.4.1 deepCopy()

```
template<typename T_Ptr , typename T_Key = const char*>
virtual void el::base::utils::Registry< T_Ptr, T_Key >::deepCopy (
            const AbstractRegistry< T_Ptr, std::unordered_map< T_Key, T_Ptr * > > & sr )
[inline], [private], [virtual]
```

Definition at line 1434 of file easylogging++.h.

9.56.4.2 get()

```
template<typename T_Ptr , typename T_Key = const char*>
T_Ptr * el::base::utils::Registry< T_Ptr, T_Key >::get (
            const T_Key & uniqKey )  [inline], [protected]
```

Gets pointer from repository. If none found, nullptr is returned.

Definition at line 1426 of file easylogging++.h.

9.56.4.3 operator=()

```
template<typename T_Ptr , typename T_Key = const char*>
Registry & el::base::utils::Registry< T_Ptr, T_Key >::operator= (
            const Registry< T_Ptr, T_Key > & sr )  [inline]
```

Assignment operator that unregisters all the existing registries and deeply copies each of repo element.

See also

unregisterAll()

deepCopy(const AbstractRegistry&)

Definition at line 1388 of file easylogging++.h.

9.56.4.4 registerNew()

```
template<typename T_Ptr , typename T_Key = const char*>
virtual void el::base::utils::Registry< T_Ptr, T_Key >::registerNew (
             const T_Key & uniqKey,
             T_Ptr * ptr )  [inline], [protected], [virtual]
```

Registers new registry to repository.

Definition at line 1411 of file easylogging++.h.

9.56.4.5 unregister()

```
template<typename T_Ptr , typename T_Key = const char*>
void el::base::utils::Registry< T_Ptr, T_Key >::unregister (
             const T_Key & uniqKey )  [inline], [protected]
```

Unregisters single entry mapped to specified unique key.

Definition at line 1417 of file easylogging++.h.

9.56.4.6 unregisterAll()

```
template<typename T_Ptr , typename T_Key = const char*>
virtual void el::base::utils::Registry< T_Ptr, T_Key >::unregisterAll (
             void  )  [inline], [protected], [virtual]
```

Unregisters all the pointers from current repository.

Implements el::base::utils::AbstractRegistry< T_Ptr, Container >.

Definition at line 1401 of file easylogging++.h.

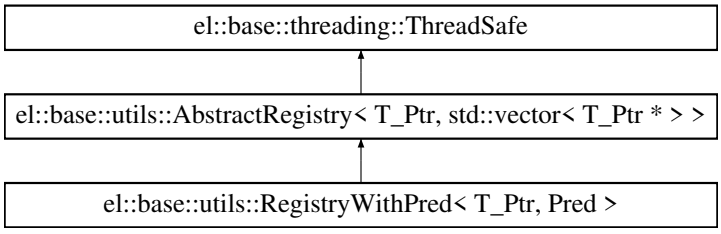
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.57 el::base::utils::RegistryWithPred< T_Ptr, Pred > Class Template Reference

A pointer registry mechanism to manage memory and provide search functionalities. (predicate version)

Inheritance diagram for el::base::utils::RegistryWithPred< T_Ptr, Pred >:



Public Types

- typedef RegistryWithPred< T_Ptr, Pred >::iterator iterator
- typedef RegistryWithPred< T_Ptr, Pred >::const_iterator const_iterator

Public Types inherited from el::base::utils::AbstractRegistry< T_Ptr, std::vector< T_Ptr * > >

- typedef Container::iterator iterator
- typedef Container::const_iterator const_iterator

Public Member Functions

- RegistryWithPred (void)
- virtual ~RegistryWithPred (void)
- RegistryWithPred (const RegistryWithPred &sr)

  Copy constructor that is useful for base classes. Try to avoid this constructor, use move constructor.
- RegistryWithPred & operator= (const RegistryWithPred &sr)

  Assignment operator that unregisters all the existing registries and deeply copies each of repo element.

Public Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, std::vector< T_Ptr * > >

- AbstractRegistry (void)

  Default constructor.
- AbstractRegistry (AbstractRegistry &&sr)

  Move constructor that is useful for base classes.
- bool operator== (const AbstractRegistry< T_Ptr, std::vector< T_Ptr * > > &other)
- bool operator!= (const AbstractRegistry< T_Ptr, std::vector< T_Ptr * > > &other)
- AbstractRegistry & operator= (AbstractRegistry &&sr)

  Assignment move operator.
- virtual ~AbstractRegistry (void)
- virtual iterator begin (void) ELPP_FINAL
- virtual iterator end (void) ELPP_FINAL
- virtual const_iterator cbegin (void) const ELPP_FINAL
- virtual const_iterator cend (void) const ELPP_FINAL
- virtual bool empty (void) const ELPP_FINAL
- virtual std::size_t size (void) const ELPP_FINAL
- virtual std::vector< T_Ptr * > & list (void) ELPP_FINAL

  Returns underlying container by reference.
- virtual const std::vector< T_Ptr * > & list (void) const ELPP_FINAL

  Returns underlying container by constant reference.

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Protected Member Functions

- virtual void unregisterAll (void) ELPP_FINAL

  Unregisters all the pointers from current repository.
- virtual void unregister (T_Ptr *&ptr) ELPP_FINAL
- virtual void registerNew (T_Ptr *ptr) ELPP_FINAL
- template<typename T , typename T2 >
  T_Ptr * get (const T &arg1, const T2 arg2)

  Gets pointer from repository with specified arguments. Arguments are passed to predicate in order to validate pointer.

Protected Member Functions inherited from el::base::utils::AbstractRegistry< T_Ptr, std::vector< T_Ptr * > >

- void reinitDeepCopy (const AbstractRegistry< T_Ptr, std::vector< T_Ptr * > > &sr)

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

Private Member Functions

- virtual void deepCopy (const AbstractRegistry< T_Ptr, std::vector< T_Ptr * > > &sr)

Friends

- base::type::ostream_t & operator<< (base::type::ostream_t &os, const RegistryWithPred &sr)

9.57.1 Detailed Description

template<typename T_Ptr, typename Pred>
class el::base::utils::RegistryWithPred< T_Ptr, Pred >

A pointer registry mechanism to manage memory and provide search functionalities. (predicate version)

@detail NOTE: This is thread-unsafe implementation of AbstractRegistry<T_Ptr, Container>. Any implementation of this class should be made thread-safe explicitly

Definition at line 1446 of file easylogging++.h.

9.57.2 Member Typedef Documentation

9.57.2.1 const_iterator

```
template<typename T_Ptr , typename Pred >
typedef RegistryWithPred<T_Ptr,Pred>::const_iterator el::base::utils::RegistryWithPred< T_↩
Ptr, Pred >::const_iterator
```

Definition at line 1449 of file easylogging++.h.

9.57.2.2 iterator

```
template<typename T_Ptr , typename Pred >
typedef RegistryWithPred<T_Ptr,Pred>::iterator el::base::utils::RegistryWithPred< T_Ptr, Pred
>::iterator
```

Definition at line 1448 of file easylogging++.h.

9.57.3 Constructor & Destructor Documentation

9.57.3.1 RegistryWithPred() [1/2]

```
template<typename T_Ptr , typename Pred >
el::base::utils::RegistryWithPred< T_Ptr, Pred >::RegistryWithPred (
            void  )  [inline]
```

Definition at line 1451 of file easylogging++.h.

9.57.3.2 ~RegistryWithPred()

```
template<typename T_Ptr , typename Pred >
virtual el::base::utils::RegistryWithPred< T_Ptr, Pred >::~RegistryWithPred (
            void  )  [inline], [virtual]
```

Definition at line 1454 of file easylogging++.h.

9.57.3.3 RegistryWithPred() [2/2]

```
template<typename T_Ptr , typename Pred >
el::base::utils::RegistryWithPred< T_Ptr, Pred >::RegistryWithPred (
            const RegistryWithPred< T_Ptr, Pred > & sr )  [inline]
```

Copy constructor that is useful for base classes. Try to avoid this constructor, use move constructor.

Definition at line 1459 of file easylogging++.h.

9.57.4 Member Function Documentation

9.57.4.1 deepCopy()

```
template<typename T_Ptr , typename Pred >
virtual void el::base::utils::RegistryWithPred< T_Ptr, Pred >::deepCopy (
            const AbstractRegistry< T_Ptr, std::vector< T_Ptr * > > & sr )  [inline], [private],
[virtual]
```

Implements el::base::utils::AbstractRegistry< T_Ptr, std::vector< T_Ptr * > >.

Definition at line 1525 of file easylogging++.h.

9.57.4.2 get()

```
template<typename T_Ptr , typename Pred >
template<typename T , typename T2 >
T_Ptr * el::base::utils::RegistryWithPred< T_Ptr, Pred >::get (
            const T & arg1,
            const T2 arg2 )  [inline], [protected]
```

Gets pointer from repository with specified arguments. Arguments are passed to predicate in order to validate pointer.

Definition at line 1516 of file easylogging++.h.

9.57.4.3 operator=()

```
template<typename T_Ptr , typename Pred >
RegistryWithPred & el::base::utils::RegistryWithPred< T_Ptr, Pred >::operator= (
            const RegistryWithPred< T_Ptr, Pred > & sr )  [inline]
```

Assignment operator that unregisters all the existing registries and deeply copies each of repo element.

See also

unregisterAll()

deepCopy(const AbstractRegistry&)

Definition at line 1469 of file easylogging++.h.

9.57.4.4 registerNew()

```
template<typename T_Ptr , typename Pred >
virtual void el::base::utils::RegistryWithPred< T_Ptr, Pred >::registerNew (
            T_Ptr * ptr )  [inline], [protected], [virtual]
```

Definition at line 1509 of file easylogging++.h.

9.57.4.5 unregister()

```
template<typename T_Ptr , typename Pred >
virtual void el::base::utils::RegistryWithPred< T_Ptr, Pred >::unregister (
            T_Ptr *& ptr )  [inline], [protected], [virtual]
```

Definition at line 1494 of file easylogging++.h.

9.57.4.6 unregisterAll()

```
template<typename T_Ptr , typename Pred >
virtual void el::base::utils::RegistryWithPred< T_Ptr, Pred >::unregisterAll (
            void  )  [inline], [protected], [virtual]
```

Unregisters all the pointers from current repository.

Implements el::base::utils::AbstractRegistry< T_Ptr, std::vector< T_Ptr * > >.

Definition at line 1485 of file easylogging++.h.

9.57.5 Friends And Related Symbol Documentation

9.57.5.1 operator<<

```
template<typename T_Ptr , typename Pred >
base::type::ostream_t & operator<< (
            base::type::ostream_t & os,
            const RegistryWithPred< T_Ptr, Pred > & sr )  [friend]
```

Definition at line 1477 of file easylogging++.h.

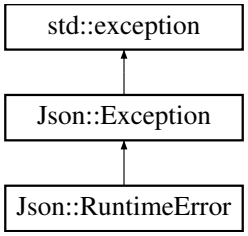
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.58 Json::RuntimeError Class Reference

```
#include <value.h>
```

Inheritance diagram for Json::RuntimeError:



Public Member Functions

- RuntimeError (String const &msg)

Public Member Functions inherited from Json::Exception

- Exception (String msg)
- ~Exception () noexcept override
- char const * what () const noexcept override

Additional Inherited Members

Protected Attributes inherited from Json::Exception

- String msg_

9.58.1 Detailed Description

Exceptions which the user cannot easily avoid.

E.g. out-of-memory (when we use malloc), stack-overflow, malicious input

Remarks

derived from Json::Exception

Definition at line 84 of file value.h.

9.58.2 Constructor & Destructor Documentation

9.58.2.1 RuntimeError()

```
Json::RuntimeError::RuntimeError (
            String const & msg )
```

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

- include/jsoncpp/value.h

9.59 el::Loggers::ScopedAddFlag Class Reference

Adds flag and removes it when scope goes out.

```
#include <easylogging++.h>
```

Public Member Functions

- ScopedAddFlag (LoggingFlag flag)
- ~ScopedAddFlag (void)

Private Attributes

- LoggingFlag m_flag

9.59.1 Detailed Description

Adds flag and removes it when scope goes out.

Definition at line 3858 of file easylogging++.h.

9.59.2 Constructor & Destructor Documentation

9.59.2.1 ScopedAddFlag()

```
el::Loggers::ScopedAddFlag::ScopedAddFlag (
            LoggingFlag flag )  [inline]
```

Definition at line 3860 of file easylogging++.h.

9.59.2.2 ~ScopedAddFlag()

```
el::Loggers::ScopedAddFlag::~ScopedAddFlag (
            void  )  [inline]
```

Definition at line 3863 of file easylogging++.h.

9.59.3 Field Documentation

9.59.3.1 m_flag

```
LoggingFlag el::Loggers::ScopedAddFlag::m_flag  [private]
```

Definition at line 3867 of file easylogging++.h.

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

- include/easylogging++.h

9.60 el::Loggers::ScopedRemoveFlag Class Reference

Removes flag and add it when scope goes out.

```
#include <easylogging++.h>
```

Public Member Functions

- ScopedRemoveFlag (LoggingFlag flag)
- ~ScopedRemoveFlag (void)

Private Attributes

- LoggingFlag m_flag

9.60.1 Detailed Description

Removes flag and add it when scope goes out.

Definition at line 3870 of file easylogging++.h.

9.60.2 Constructor & Destructor Documentation

9.60.2.1 ScopedRemoveFlag()

```
el::Loggers::ScopedRemoveFlag::ScopedRemoveFlag (
            LoggingFlag flag )  [inline]
```

Definition at line 3872 of file easylogging++.h.

9.60.2.2 ~ScopedRemoveFlag()

```
el::Loggers::ScopedRemoveFlag::~ScopedRemoveFlag (
            void  )  [inline]
```

Definition at line 3875 of file easylogging++.h.

9.60.3 Field Documentation

9.60.3.1 m_flag

```
LoggingFlag el::Loggers::ScopedRemoveFlag::m_flag  [private]
```

Definition at line 3879 of file easylogging++.h.

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

- include/easylogging++.h

9.61 Json::SecureAllocator< T > Class Template Reference

```
#include <allocator.h>
```

Data Structures

- struct rebind

Public Types

- using value_type = T
- using pointer = T *
- using const_pointer = const T *
- using reference = T &
- using const_reference = const T &
- using size_type = std::size_t
- using difference_type = std::ptrdiff_t

Public Member Functions

- pointer allocate (size_type n)
- void deallocate (pointer p, size_type n)
- template<typename... Args>
  void construct (pointer p, Args &&... args)
- size_type max_size () const
- pointer address (reference x) const
- const_pointer address (const_reference x) const
- void destroy (pointer p)
- SecureAllocator ()
- template<typename U >
  SecureAllocator (const SecureAllocator< U > &)

9.61.1 Detailed Description

template<typename T>
class Json::SecureAllocator< T >

Definition at line 16 of file allocator.h.

9.61.2 Member Typedef Documentation

9.61.2.1 const_pointer

```
template<typename T >
using Json::SecureAllocator< T >::const_pointer = const T*
```

Definition at line 21 of file allocator.h.

9.61.2.2 const_reference

```
template<typename T >
using Json::SecureAllocator< T >::const_reference = const T&
```

Definition at line 23 of file allocator.h.

9.61.2.3 difference_type

```
template<typename T >
using Json::SecureAllocator< T >::difference_type = std::ptrdiff_t
```

Definition at line 25 of file allocator.h.

9.61.2.4 pointer

```
template<typename T >
using Json::SecureAllocator< T >::pointer = T*
```

Definition at line 20 of file allocator.h.

9.61.2.5 reference

```
template<typename T >
using Json::SecureAllocator< T >::reference = T&
```

Definition at line 22 of file allocator.h.

9.61.2.6 size_type

```
template<typename T >
using Json::SecureAllocator< T >::size_type = std::size_t
```

Definition at line 24 of file allocator.h.

9.61.2.7 value_type

```
template<typename T >
using Json::SecureAllocator< T >::value_type = T
```

Definition at line 19 of file allocator.h.

9.61.3 Constructor & Destructor Documentation

9.61.3.1 SecureAllocator() [1/2]

```
template<typename T >
Json::SecureAllocator< T >::SecureAllocator ( )  [inline]
```

Definition at line 76 of file allocator.h.

9.61.3.2 SecureAllocator() [2/2]

```
template<typename T >
template<typename U >
Json::SecureAllocator< T >::SecureAllocator (
            const SecureAllocator< U > &  )  [inline]
```

Definition at line 77 of file allocator.h.

9.61.4 Member Function Documentation

9.61.4.1 address() [1/2]

```
template<typename T >
const_pointer Json::SecureAllocator< T >::address (
            const_reference x ) const  [inline]
```

Definition at line 63 of file allocator.h.

9.61.4.2 address() [2/2]

```
template<typename T >
pointer Json::SecureAllocator< T >::address (
            reference x ) const  [inline]
```

Definition at line 59 of file allocator.h.

9.61.4.3 allocate()

```
template<typename T >
pointer Json::SecureAllocator< T >::allocate (
            size_type n )  [inline]
```

Allocate memory for N items using the standard allocator.

Definition at line 30 of file allocator.h.

9.61.4.4 construct()

```
template<typename T >
template<typename... Args>
void Json::SecureAllocator< T >::construct (
            pointer p,
            Args &&... args )  [inline]
```

Construct an item in-place at pointer P.

Definition at line 50 of file allocator.h.

9.61.4.5 deallocate()

```
template<typename T >
void Json::SecureAllocator< T >::deallocate (
            pointer p,
            size_type n )  [inline]
```

Release memory which was allocated for N items at pointer P.

The memory block is filled with zeroes before being released.

Definition at line 40 of file allocator.h.

9.61.4.6 destroy()

```
template<typename T >
void Json::SecureAllocator< T >::destroy (
            pointer p )  [inline]
```

Destroy an item in-place at pointer P.

Definition at line 70 of file allocator.h.

9.61.4.7 max_size()

```
template<typename T >
size_type Json::SecureAllocator< T >::max_size ( ) const  [inline]
```

Definition at line 55 of file allocator.h.

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

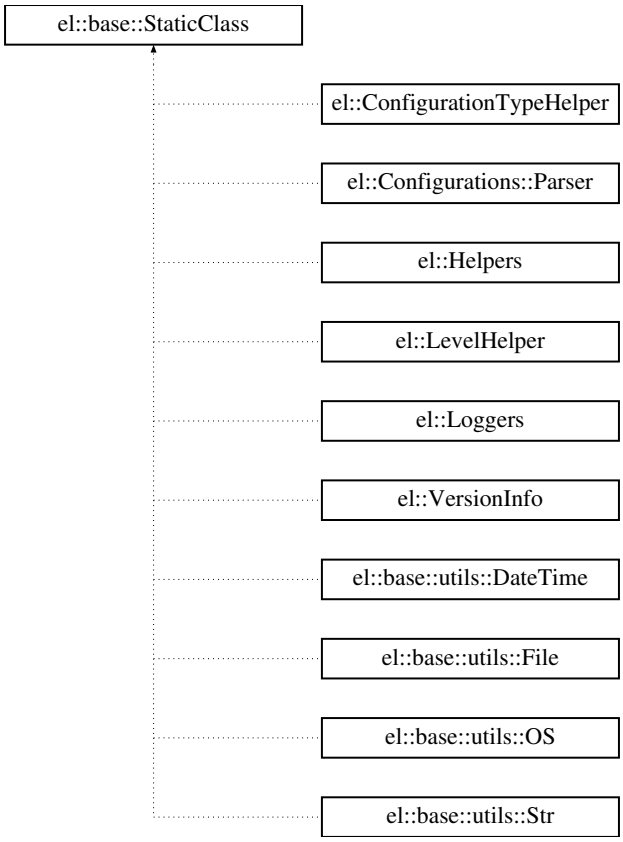
- include/jsoncpp/allocator.h

9.62 el::base::StaticClass Class Reference

Internal helper class that makes all default constructors private.

```
#include <easylogging++.h>
```

Inheritance diagram for el::base::StaticClass:



Private Member Functions

- StaticClass (void)
- StaticClass (const StaticClass &)
- StaticClass & operator= (const StaticClass &)

9.62.1 Detailed Description

Internal helper class that makes all default constructors private.

@detail This prevents initializing class making it static unless an explicit constructor is declared. When using this class simply inherit it privately

Definition at line 562 of file easylogging++.h.

9.62.2 Constructor & Destructor Documentation

9.62.2.1 StaticClass() [1/2]

```
el::base::StaticClass::StaticClass (
            void  )  [private]
```

9.62.2.2 StaticClass() [2/2]

```
el::base::StaticClass::StaticClass (
            const StaticClass &  )  [private]
```

9.62.3 Member Function Documentation

9.62.3.1 operator=()

```
StaticClass & el::base::StaticClass::operator= (
            const StaticClass &  )  [private]
```

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

- include/easylogging++.h

9.63 Json::StaticString Class Reference

Lightweight wrapper to tag static string.

`#include <value.h>`

Public Member Functions

- StaticString (const char *czstring)
- operator const char * () const
- const char * c_str () const

Private Attributes

- const char * c_str_

9.63.1 Detailed Description

Lightweight wrapper to tag static string.

Value constructor and objectValue member assignment takes advantage of the StaticString and avoid the cost of string duplication when storing the string or the member name.

Example of usage:
```
Json::Value aValue( StaticString("some text") );
Json::Value object;
static const StaticString code("code");
object[code] = 1234;
```

Definition at line 148 of file value.h.

9.63.2 Constructor & Destructor Documentation

9.63.2.1 StaticString()

```
Json::StaticString::StaticString (
            const char * czstring )  [inline], [explicit]
```

Definition at line 150 of file value.h.

9.63.3 Member Function Documentation

9.63.3.1 c_str()

```
const char * Json::StaticString::c_str ( ) const  [inline]
```

Definition at line 156 of file value.h.

9.63.3.2 operator const char *()

```
Json::StaticString::operator const char * ( ) const  [inline]
```

Definition at line 152 of file value.h.

9.63.4 Field Documentation

9.63.4.1 c_str_

```
const char* Json::StaticString::c_str_  [private]
```

Definition at line 161 of file value.h.

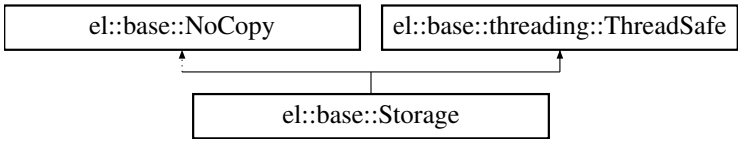
The documentation for this class was generated from the following file:

- include/jsoncpp/value.h

9.64 el::base::Storage Class Reference

Easylogging++ management storage.

Inheritance diagram for el::base::Storage:



Public Member Functions

- Storage (const LogBuilderPtr &defaultLogBuilder)
- virtual ~Storage (void)
- bool validateEveryNCounter (const char *filename, base::type::LineNumber lineNumber, std::size_t occasion)
- bool validateAfterNCounter (const char *filename, base::type::LineNumber lineNumber, std::size_t n)
- bool validateNTimesCounter (const char *filename, base::type::LineNumber lineNumber, std::size_t n)
- base::RegisteredHitCounters * hitCounters (void) const
- base::RegisteredLoggers * registeredLoggers (void) const
- base::VRegistry * vRegistry (void) const
- const base::utils::CommandLineArgs * commandLineArgs (void) const
- void addFlag (LoggingFlag flag)
- void removeFlag (LoggingFlag flag)
- bool hasFlag (LoggingFlag flag) const
- base::type::EnumType flags (void) const
- void setFlags (base::type::EnumType flags)
- void setPreRollOutCallback (const PreRollOutCallback &callback)
- void unsetPreRollOutCallback (void)
- PreRollOutCallback & preRollOutCallback (void)
- bool hasCustomFormatSpecifier (const char *formatSpecifier)
- void installCustomFormatSpecifier (const CustomFormatSpecifier &customFormatSpecifier)
- bool uninstallCustomFormatSpecifier (const char *formatSpecifier)
- const std::vector< CustomFormatSpecifier > * customFormatSpecifiers (void) const
- base::threading::Mutex & customFormatSpecifiersLock ()
- void setLoggingLevel (Level level)
- template<typename T >
  bool installLogDispatchCallback (const std::string &id)
- template<typename T >
  void uninstallLogDispatchCallback (const std::string &id)
- template<typename T >
  T * logDispatchCallback (const std::string &id)
- void setThreadName (const std::string &name)

  Sets thread name for current thread. Requires std::thread.
- std::string getThreadName (const std::string &threadId)

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Private Member Functions

- void setApplicationArguments (int argc, char **argv)
- void setApplicationArguments (int argc, const char **argv)

Private Member Functions inherited from el::base::NoCopy

- NoCopy (void)

Private Attributes

- base::RegisteredHitCounters * m_registeredHitCounters
- base::RegisteredLoggers * m_registeredLoggers
- base::type::EnumType m_flags
- base::VRegistry * m_vRegistry
- base::utils::CommandLineArgs m_commandLineArgs
- PreRollOutCallback m_preRollOutCallback
- std::unordered_map< std::string, base::type::LogDispatchCallbackPtr > m_logDispatchCallbacks
- std::unordered_map< std::string, base::type::PerformanceTrackingCallbackPtr > m_performanceTrackingCallbacks
- std::unordered_map< std::string, std::string > m_threadNames
- std::vector< CustomFormatSpecifier > m_customFormatSpecifiers
- base::threading::Mutex m_customFormatSpecifiersLock
- base::threading::Mutex m_threadNamesLock
- Level m_loggingLevel

Friends

- class el::Helpers
- class el::base::DefaultLogDispatchCallback
- class el::LogBuilder
- class el::base::MessageBuilder
- class el::base::Writer
- class el::base::PerformanceTracker
- class el::base::LogDispatcher

Additional Inherited Members

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

9.64.1 Detailed Description

Easylogging++ management storage.

Definition at line 2551 of file easylogging++.h.

9.64.2 Constructor & Destructor Documentation

9.64.2.1 Storage()

```
el::base::Storage::Storage (
            const LogBuilderPtr & defaultLogBuilder )  [explicit]
```

Definition at line 2061 of file easylogging++.cc.

References el::AllowVerboseIfModuleNotSpecified, el::Logger::configurations(), ELPP_INTERNAL_INFO, el::Format, el::base::consts::kDefaultLoggerId, el::Logger::reconfigure(), and el::Configurations::setGlobally().

9.64.2.2 ~Storage()

```
el::base::Storage::~Storage (
            void  )  [virtual]
```

Definition at line 2109 of file easylogging++.cc.

References ELPP_INTERNAL_INFO, m_registeredHitCounters, m_registeredLoggers, m_vRegistry, and el::base::utils::safeDelete().

9.64.3 Member Function Documentation

9.64.3.1 addFlag()

```
void el::base::Storage::addFlag (
            LoggingFlag flag )  [inline]
```

Definition at line 2595 of file easylogging++.h.

9.64.3.2 commandLineArgs()

```
const base::utils::CommandLineArgs * el::base::Storage::commandLineArgs (
            void  ) const  [inline]
```

Definition at line 2591 of file easylogging++.h.

9.64.3.3 customFormatSpecifiers()

```
const std::vector< CustomFormatSpecifier > * el::base::Storage::customFormatSpecifiers (
            void  ) const  [inline]
```

Definition at line 2631 of file easylogging++.h.

9.64.3.4 customFormatSpecifiersLock()

```
base::threading::Mutex & el::base::Storage::customFormatSpecifiersLock ( )  [inline]
```

Definition at line 2635 of file easylogging++.h.

9.64.3.5 flags()

```
base::type::EnumType el::base::Storage::flags (
            void  ) const  [inline]
```

Definition at line 2607 of file easylogging++.h.

9.64.3.6 getThreadName()

```
std::string el::base::Storage::getThreadName (
            const std::string & threadId )  [inline]
```

Definition at line 2683 of file easylogging++.h.

9.64.3.7 hasCustomFormatSpecifier()

```
bool el::base::Storage::hasCustomFormatSpecifier (
            const char * formatSpecifier )
```

Definition at line 2128 of file easylogging++.cc.

References customFormatSpecifiersLock(), and m_customFormatSpecifiers.

9.64.3.8 hasFlag()

```
bool el::base::Storage::hasFlag (
            LoggingFlag flag ) const  [inline]
```

Definition at line 2603 of file easylogging++.h.

9.64.3.9 hitCounters()

```
base::RegisteredHitCounters * el::base::Storage::hitCounters (
            void  ) const  [inline]
```

Definition at line 2573 of file easylogging++.h.

9.64.3.10 installCustomFormatSpecifier()

```
void el::base::Storage::installCustomFormatSpecifier (
            const CustomFormatSpecifier & customFormatSpecifier )
```

Definition at line 2134 of file easylogging++.cc.

References customFormatSpecifiersLock(), el::CustomFormatSpecifier::formatSpecifier(), hasCustomFormatSpecifier(), and m_customFormatSpecifiers.

9.64.3.11 installLogDispatchCallback()

```
template<typename T >
bool el::base::Storage::installLogDispatchCallback (
            const std::string & id )  [inline]
```

Definition at line 2644 of file easylogging++.h.

9.64.3.12 logDispatchCallback()

```
template<typename T >
T * el::base::Storage::logDispatchCallback (
            const std::string & id )  [inline]
```

Definition at line 2653 of file easylogging++.h.

9.64.3.13 preRollOutCallback()

```
PreRollOutCallback & el::base::Storage::preRollOutCallback (
            void  )  [inline]
```

Definition at line 2623 of file easylogging++.h.

9.64.3.14 registeredLoggers()

```
base::RegisteredLoggers * el::base::Storage::registeredLoggers (
            void  ) const  [inline]
```

Definition at line 2577 of file easylogging++.h.

9.64.3.15 removeFlag()

```
void el::base::Storage::removeFlag (
            LoggingFlag flag )  [inline]
```

Definition at line 2599 of file easylogging++.h.

9.64.3.16 setApplicationArguments() [1/2]

```
void el::base::Storage::setApplicationArguments (
            int argc,
            char ** argv )  [private]
```

Definition at line 2153 of file easylogging++.cc.

References commandLineArgs(), ELPP_DEFAULT_LOGGING_FLAGS, el::base::utils::AbstractRegistry< T_Ptr, Container >::end(), el::Filename, el::base::utils::CommandLineArgs::getParamValue(), el::base::utils::CommandLineArgs::hasParamWithValue(), el::base::consts::kDefaultLogFileParam, m_commandLineArgs, m_flags, m_vRegistry, registeredLoggers(), el::base::utils::CommandLineArgs::setArgs(), el::base::RegisteredLoggers::setDefaultConfigurations(), el::base::VRegistry::setFromA and el::Configurations::setGlobally().

9.64.3.17 setApplicationArguments() [2/2]

```
void el::base::Storage::setApplicationArguments (
            int argc,
            const char ** argv )  [inline], [private]
```

Definition at line 2720 of file easylogging++.h.

9.64.3.18 setFlags()

```
void el::base::Storage::setFlags (
            base::type::EnumType flags )  [inline]
```

Definition at line 2611 of file easylogging++.h.

9.64.3.19 setLoggingLevel()

```
void el::base::Storage::setLoggingLevel (
            Level level )  [inline]
```

Definition at line 2639 of file easylogging++.h.

9.64.3.20 setPreRollOutCallback()

```
void el::base::Storage::setPreRollOutCallback (
            const PreRollOutCallback & callback )  [inline]
```

Definition at line 2615 of file easylogging++.h.

9.64.3.21 setThreadName()

```
void el::base::Storage::setThreadName (
            const std::string & name )  [inline]
```

Sets thread name for current thread. Requires std::thread.

Definition at line 2677 of file easylogging++.h.

9.64.3.22 uninstallCustomFormatSpecifier()

```
bool el::base::Storage::uninstallCustomFormatSpecifier (
            const char * formatSpecifier )
```

Definition at line 2142 of file easylogging++.cc.

References customFormatSpecifiersLock(), and m_customFormatSpecifiers.

9.64.3.23 uninstallLogDispatchCallback()

```
template<typename T >
void el::base::Storage::uninstallLogDispatchCallback (
            const std::string & id )  [inline]
```

Definition at line 2649 of file easylogging++.h.

9.64.3.24 unsetPreRollOutCallback()

```
void el::base::Storage::unsetPreRollOutCallback (
             void  )  [inline]
```

Definition at line 2619 of file easylogging++.h.

9.64.3.25 validateAfterNCounter()

```
bool el::base::Storage::validateAfterNCounter (
             const char * filename,
             base::type::LineNumber lineNumber,
             std::size_t n )  [inline]
```

Definition at line 2565 of file easylogging++.h.

9.64.3.26 validateEveryNCounter()

```
bool el::base::Storage::validateEveryNCounter (
             const char * filename,
             base::type::LineNumber lineNumber,
             std::size_t occasion )  [inline]
```

Definition at line 2561 of file easylogging++.h.

9.64.3.27 validateNTimesCounter()

```
bool el::base::Storage::validateNTimesCounter (
             const char * filename,
             base::type::LineNumber lineNumber,
             std::size_t n )  [inline]
```

Definition at line 2569 of file easylogging++.h.

9.64.3.28 vRegistry()

```
base::VRegistry * el::base::Storage::vRegistry (
             void  ) const  [inline]
```

Definition at line 2581 of file easylogging++.h.

9.64.4 Friends And Related Symbol Documentation

9.64.4.1 el::base::DefaultLogDispatchCallback

```
friend class el::base::DefaultLogDispatchCallback  [friend]
```

Definition at line 2711 of file easylogging++.h.

9.64.4.2 el::base::LogDispatcher

```
friend class el::base::LogDispatcher  [friend]
```

Definition at line 2716 of file easylogging++.h.

9.64.4.3 el::base::MessageBuilder

```
friend class el::base::MessageBuilder  [friend]
```

Definition at line 2713 of file easylogging++.h.

9.64.4.4 el::base::PerformanceTracker

```
friend class el::base::PerformanceTracker  [friend]
```

Definition at line 2715 of file easylogging++.h.

9.64.4.5 el::base::Writer

```
friend class el::base::Writer  [friend]
```

Definition at line 2714 of file easylogging++.h.

9.64.4.6 el::Helpers

```
friend class el::Helpers  [friend]
```

Definition at line 2710 of file easylogging++.h.

9.64.4.7 el::LogBuilder

```
friend class el::LogBuilder  [friend]
```

Definition at line 2712 of file easylogging++.h.

9.64.5 Field Documentation

9.64.5.1 m_commandLineArgs

```
base::utils::CommandLineArgs el::base::Storage::m_commandLineArgs  [private]
```

Definition at line 2700 of file easylogging++.h.

9.64.5.2 m_customFormatSpecifiers

```
std::vector<CustomFormatSpecifier> el::base::Storage::m_customFormatSpecifiers  [private]
```

Definition at line 2705 of file easylogging++.h.

9.64.5.3 m_customFormatSpecifiersLock

```
base::threading::Mutex el::base::Storage::m_customFormatSpecifiersLock  [private]
```

Definition at line 2706 of file easylogging++.h.

9.64.5.4 m_flags

```
base::type::EnumType el::base::Storage::m_flags  [private]
```

Definition at line 2694 of file easylogging++.h.

9.64.5.5 m_logDispatchCallbacks

```
std::unordered_map<std::string, base::type::LogDispatchCallbackPtr> el::base::Storage::m_log↩
DispatchCallbacks  [private]
```

Definition at line 2702 of file easylogging++.h.

9.64.5.6 m_loggingLevel

```
Level el::base::Storage::m_loggingLevel  [private]
```

Definition at line 2708 of file easylogging++.h.

9.64.5.7 m_performanceTrackingCallbacks

```
std::unordered_map<std::string, base::type::PerformanceTrackingCallbackPtr> el::base::Storage↩
::m_performanceTrackingCallbacks  [private]
```

Definition at line 2703 of file easylogging++.h.

9.64.5.8 m_preRollOutCallback

```
PreRollOutCallback el::base::Storage::m_preRollOutCallback  [private]
```

Definition at line 2701 of file easylogging++.h.

9.64.5.9 m_registeredHitCounters

```
base::RegisteredHitCounters* el::base::Storage::m_registeredHitCounters  [private]
```

Definition at line 2692 of file easylogging++.h.

9.64.5.10 m_registeredLoggers

```
base::RegisteredLoggers* el::base::Storage::m_registeredLoggers  [private]
```

Definition at line 2693 of file easylogging++.h.

9.64.5.11 m_threadNames

```
std::unordered_map<std::string, std::string> el::base::Storage::m_threadNames  [private]
```

Definition at line 2704 of file easylogging++.h.

9.64.5.12 m_threadNamesLock

```
base::threading::Mutex el::base::Storage::m_threadNamesLock  [private]
```

Definition at line 2707 of file easylogging++.h.

9.64.5.13 m_vRegistry

```
base::VRegistry* el::base::Storage::m_vRegistry  [private]
```

Definition at line 2695 of file easylogging++.h.

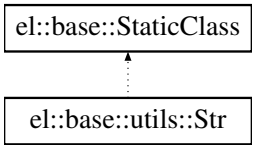
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.65 el::base::utils::Str Class Reference

String utilities helper class used internally. You should not use it.

Inheritance diagram for el::base::utils::Str:



Static Public Member Functions

- static bool isDigit (char c)

  Checks if character is digit. Dont use libc implementation of it to prevent locale issues.
- static bool wildCardMatch (const char *str, const char *pattern)

  Matches wildcards, '' and '?' only supported.*
- static std::string & ltrim (std::string &str)
- static std::string & rtrim (std::string &str)
- static std::string & trim (std::string &str)
- static bool startsWith (const std::string &str, const std::string &start)

  Determines whether or not str starts with specified string.
- static bool endsWith (const std::string &str, const std::string &end)

  Determines whether or not str ends with specified string.
- static std::string & replaceAll (std::string &str, char replaceWhat, char replaceWith)

  Replaces all instances of replaceWhat with 'replaceWith'. Original variable is changed for performance.
- static std::string & replaceAll (std::string &str, const std::string &replaceWhat, const std::string &replaceWith)

  Replaces all instances of 'replaceWhat' with 'replaceWith'. (String version) Replaces in place.
- static void replaceFirstWithEscape (base::type::string_t &str, const base::type::string_t &replaceWhat, const base::type::string_t &replaceWith)
- static std::string & toUpper (std::string &str)

  Converts string to uppercase.
- static bool cStringEq (const char *s1, const char *s2)

  Compares cstring equality - uses strcmp.
- static bool cStringCaseEq (const char *s1, const char *s2)

  Compares cstring equality (case-insensitive) - uses toupper(char) Dont use strcasecmp because of CRT (VC++)
- static bool contains (const char *str, char c)

  Returns true if c exist in str.
- static char * convertAndAddToBuff (std::size_t n, int len, char *buf, const char *bufLim, bool zero↩ Padded=true)
- static char * addToBuff (const char *str, char *buf, const char *bufLim)
- static char * clearBuff (char buff[ ], std::size_t lim)
- static char * wcharPtrToCharPtr (const wchar_t *line)

  Converts wchar to char* NOTE: Need to free return value after use!*

9.65.1 Detailed Description

String utilities helper class used internally. You should not use it.

Definition at line 1066 of file easylogging++.h.

9.65.2 Member Function Documentation

9.65.2.1 addToBuff()

```
char * el::base::utils::Str::addToBuff (
            const char * str,
            char * buf,
            const char * bufLim )  [static]
```

Definition at line 1000 of file easylogging++.cc.

9.65.2.2 clearBuff()

```
char * el::base::utils::Str::clearBuff (
            char buff[],
            std::size_t lim )  [static]
```

Definition at line 1006 of file easylogging++.cc.

References ELPP_UNUSED, and STRCPY.

9.65.2.3 contains()

```
bool el::base::utils::Str::contains (
            const char * str,
            char c )  [static]
```

Returns true if c exist in str.

Definition at line 977 of file easylogging++.cc.

9.65.2.4 convertAndAddToBuff()

```
char * el::base::utils::Str::convertAndAddToBuff (
            std::size_t n,
            int len,
            char * buf,
            const char * bufLim,
            bool zeroPadded = true )  [static]
```

Definition at line 985 of file easylogging++.cc.

References addToBuff().

9.65.2.5 cStringCaseEq()

```
bool el::base::utils::Str::cStringCaseEq (
            const char * s1,
            const char * s2 )  [static]
```

Compares cstring equality (case-insensitive) - uses toupper(char) Dont use strcasecmp because of CRT (VC++)

Definition at line 958 of file easylogging++.cc.

9.65.2.6 cStringEq()

```
bool el::base::utils::Str::cStringEq (
            const char * s1,
            const char * s2 )  [static]
```

Compares cstring equality - uses strcmp.

Definition at line 952 of file easylogging++.cc.

9.65.2.7 endsWith()

```
bool el::base::utils::Str::endsWith (
            const std::string & str,
            const std::string & end )  [static]
```

Determines whether or not str ends with specified string.

Parameters

str	String to check
end	String to check against

Returns

Returns true if ends with specified string, false otherwise

Definition at line 904 of file easylogging++.cc.

9.65.2.8 isDigit()

```
static bool el::base::utils::Str::isDigit (
             char c )  [inline], [static]
```

Checks if character is digit. Dont use libc implementation of it to prevent locale issues.

Definition at line 1069 of file easylogging++.h.

9.65.2.9 ltrim()

```
std::string & el::base::utils::Str::ltrim (
             std::string & str )  [static]
```

Definition at line 882 of file easylogging++.cc.

9.65.2.10 replaceAll() [1/2]

```
std::string & el::base::utils::Str::replaceAll (
             std::string & str,
             char replaceWhat,
             char replaceWith )  [static]
```

Replaces all instances of replaceWhat with 'replaceWith'. Original variable is changed for performance.

Parameters

in,out		
	str	String to replace from
	replaceWhat	Character to replace
	replaceWith	Character to replace with

Returns

Modified version of str

Definition at line 908 of file easylogging++.cc.

9.65.2.11 replaceAll() [2/2]

```
std::string & el::base::utils::Str::replaceAll (
             std::string & str,
             const std::string & replaceWhat,
             const std::string & replaceWith )  [static]
```

Replaces all instances of 'replaceWhat' with 'replaceWith'. (String version) Replaces in place.

Parameters

str	String to replace from
replaceWhat	Character to replace
replaceWith	Character to replace with

Returns

Modified (original) str

Definition at line 913 of file easylogging++.cc.

9.65.2.12 replaceFirstWithEscape()

```
void el::base::utils::Str::replaceFirstWithEscape (
             base::type::string_t & str,
             const base::type::string_t & replaceWhat,
             const base::type::string_t & replaceWith )  [static]
```

Definition at line 924 of file easylogging++.cc.

References el::base::consts::kFormatSpecifierChar.

9.65.2.13 rtrim()

```
std::string & el::base::utils::Str::rtrim (
             std::string & str )  [static]
```

Definition at line 889 of file easylogging++.cc.

9.65.2.14 startsWith()

```
bool el::base::utils::Str::startsWith (
             const std::string & str,
             const std::string & start )  [static]
```

Determines whether or not str starts with specified string.

Parameters

str	String to check
start	String to check against

Returns

Returns true if starts with specified string, false otherwise

Definition at line 900 of file easylogging++.cc.

9.65.2.15 toUpper()

```
std::string & el::base::utils::Str::toUpper (
             std::string & str )  [static]
```

Converts string to uppercase.

Parameters

str	String to convert

Returns

Uppercase string

Definition at line 944 of file easylogging++.cc.

9.65.2.16 trim()

```
std::string & el::base::utils::Str::trim (
             std::string & str )  [static]
```

Definition at line 896 of file easylogging++.cc.

References ltrim(), and rtrim().

9.65.2.17 wcharPtrToCharPtr()

```
char * el::base::utils::Str::wcharPtrToCharPtr (
             const wchar_t * line )  [static]
```

Converts wchar* to char* NOTE: Need to free return value after use!

Definition at line 1014 of file easylogging++.cc.

9.65.2.18 wildCardMatch()

```
bool el::base::utils::Str::wildCardMatch (
             const char * str,
             const char * pattern )  [static]
```

Matches wildcards, '*' and '?' only supported.

Definition at line 858 of file easylogging++.cc.

References wildCardMatch().

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

- include/easylogging++.h
- lib/easylogging++.cc

9.66 Json::StreamWriter Class Reference

```
#include <writer.h>
```

Data Structures

- class Factory

  A simple abstract factory.

Public Member Functions

- StreamWriter ()
- virtual ~StreamWriter ()
- virtual int write (Value const &root, OStream *sout)=0

Protected Attributes

- OStream * sout_

9.66.1 Detailed Description

Usage:

```
 using namespace Json;
 void writeToStdout(StreamWriter::Factory const& factory, Value const& value)
{ std::unique_ptr<StreamWriter> const writer( factory.newStreamWriter());
   writer->write(value, &std::cout);
   std::cout << std::endl;  // add lf and flush
 }
```

Definition at line 42 of file writer.h.

9.66.2 Constructor & Destructor Documentation

9.66.2.1 StreamWriter()

```
Json::StreamWriter::StreamWriter ( )
```

9.66.2.2 ~StreamWriter()

```
virtual Json::StreamWriter::~StreamWriter ( )  [virtual]
```

9.66.3 Member Function Documentation

9.66.3.1 write()

```
virtual int Json::StreamWriter::write (
            Value const & root,
            OStream * sout )  [pure virtual]
```

Write Value into document as configured in sub-class. Do not take ownership of sout, but maintain a reference during function.

Precondition

sout != NULL

Returns

zero on success (For now, we always return zero, so check the stream instead.)

Exceptions

std::exception	possibly, depending on configuration

9.66.4 Field Documentation

9.66.4.1 sout_

```
OStream* Json::StreamWriter::sout_  [protected]
```

Definition at line 44 of file writer.h.

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

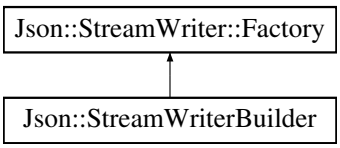
- include/jsoncpp/writer.h

9.67 Json::StreamWriterBuilder Class Reference

Build a StreamWriter implementation.

`#include <writer.h>`

Inheritance diagram for Json::StreamWriterBuilder:



Public Member Functions

- StreamWriterBuilder ()
- ~StreamWriterBuilder () override
- StreamWriter * newStreamWriter () const override
- bool validate (Json::Value *invalid) const
- Value & operator[] (const String &key)

Public Member Functions inherited from Json::StreamWriter::Factory

- virtual ~Factory ()

Static Public Member Functions

- static void setDefaults (Json::Value *settings)

Data Fields

- Json::Value settings_

9.67.1 Detailed Description

Build a StreamWriter implementation.

Usage:
```
using namespace Json;
Value value = ...;
StreamWriterBuilder builder;
builder["commentStyle"] = "None";
builder["indentation"] = "   ";  // or whatever you like
std::unique_ptr<Json::StreamWriter> writer(
   builder.newStreamWriter());
writer->write(value, &std::cout);
std::cout << std::endl;  // add lf and flush
```

Definition at line 90 of file writer.h.

9.67.2 Constructor & Destructor Documentation

9.67.2.1 StreamWriterBuilder()

```
Json::StreamWriterBuilder::StreamWriterBuilder ( )
```

9.67.2.2 ~StreamWriterBuilder()

```
Json::StreamWriterBuilder::~StreamWriterBuilder ( )  [override]
```

9.67.3 Member Function Documentation

9.67.3.1 newStreamWriter()

```
StreamWriter * Json::StreamWriterBuilder::newStreamWriter ( ) const  [override], [virtual]
```

Exceptions

std::exception	if something goes wrong (e.g. invalid settings)

Implements Json::StreamWriter::Factory.

9.67.3.2 operator[]()

```
Value & Json::StreamWriterBuilder::operator[] (
            const String & key )
```

A simple way to update a specific setting.

9.67.3.3 setDefaults()

```
static void Json::StreamWriterBuilder::setDefaults (
            Json::Value * settings )  [static]
```

Called by ctor, but you can use this to reset settings_.

Precondition

'settings' != NULL (but Json::null is fine)

Remarks

Defaults:

9.67.3.4 validate()

```
bool Json::StreamWriterBuilder::validate (
            Json::Value * invalid ) const
```

Returns

true if 'settings' are legal and consistent; otherwise, indicate bad settings via 'invalid'.

9.67.4 Field Documentation

9.67.4.1 settings_

```
Json::Value Json::StreamWriterBuilder::settings_
```

Configuration of this builder. Available settings (case-sensitive):

- "commentStyle": "None" or "All"
- "indentation": "<anything>".
- Setting this to an empty string also omits newline characters.
- "enableYAMLCompatibility": false or true
- slightly change the whitespace around colons
- "dropNullPlaceholders": false or true
- Drop the "null" string from the writer's output for nullValues. Strictly speaking, this is not valid JSON. But when the output is being fed to a browser's JavaScript, it makes for smaller output and the browser can handle the output just fine.
- "useSpecialFloats": false or true
- If true, outputs non-finite floating point values in the following way: NaN values as "NaN", positive infinity as "Infinity", and negative infinity as "-Infinity".
- "precision": int
- Number of precision digits for formatting of real values.
- "precisionType": "significant"(default) or "decimal"
- Type of precision for formatting of real values.
- "emitUTF8": false or true
- If true, outputs raw UTF8 strings instead of escaping them.

You can examine 'settings_` yourself to see the defaults. You can also write and read them just like any JSON Value.

See also

setDefaults()

Definition at line 122 of file writer.h.

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

- include/jsoncpp/writer.h

9.68 Json::Value::CZString::StringStorage Struct Reference

Data Fields

- unsigned policy_: 2
- unsigned length_: 30

9.68.1 Detailed Description

Definition at line 287 of file value.h.

9.68.2 Field Documentation

9.68.2.1 length_

```
unsigned Json::Value::CZString::StringStorage::length_
```

Definition at line 289 of file value.h.

9.68.2.2 policy_

```
unsigned Json::Value::CZString::StringStorage::policy_
```

Definition at line 288 of file value.h.

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

- include/jsoncpp/value.h

9.69 el::StringToLevelItem Struct Reference

Data Fields

- const char * levelString
- Level level

9.69.1 Detailed Description

Definition at line 145 of file easylogging++.cc.

9.69.2 Field Documentation

9.69.2.1 level

```
Level el::StringToLevelItem::level
```

Definition at line 147 of file easylogging++.cc.

9.69.2.2 levelString

```
const char* el::StringToLevelItem::levelString
```

Definition at line 146 of file easylogging++.cc.

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

- lib/easylogging++.cc

9.70 Json::Reader::StructuredError Struct Reference

An error tagged with where in the JSON text it was encountered.

```
#include <reader.h>
```

Data Fields

- ptrdiff_t offset_start
- ptrdiff_t offset_limit
- String message

9.70.1 Detailed Description

An error tagged with where in the JSON text it was encountered.

The offsets give the [start, limit) range of bytes within the text. Note that this is bytes, not codepoints.

Definition at line 47 of file reader.h.

9.70.2 Field Documentation

9.70.2.1 message

```
String Json::Reader::StructuredError::message
```

Definition at line 50 of file reader.h.

9.70.2.2 offset_limit

```
ptrdiff_t Json::Reader::StructuredError::offset_limit
```

Definition at line 49 of file reader.h.

9.70.2.3 offset_start

```
ptrdiff_t Json::Reader::StructuredError::offset_start
```

Definition at line 48 of file reader.h.

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

- include/jsoncpp/reader.h

9.71 Json::StyledStreamWriter Class Reference

Writes a Value in JSON format in a human friendly way, to a stream rather than to a string.

```
#include <writer.h>
```

Public Member Functions

- StyledStreamWriter (String indentation="\t")
- ~StyledStreamWriter ()=default
- void write (OStream &out, const Value &root)

  Serialize a Value in JSON format.

Private Types

- using ChildValues = std::vector< String >

Private Member Functions

- void writeValue (const Value &value)
- void writeArrayValue (const Value &value)
- bool isMultilineArray (const Value &value)
- void pushValue (const String &value)
- void writeIndent ()
- void writeWithIndent (const String &value)
- void indent ()
- void unindent ()
- void writeCommentBeforeValue (const Value &root)
- void writeCommentAfterValueOnSameLine (const Value &root)

Static Private Member Functions

- static bool hasCommentForValue (const Value &value)
- static String normalizeEOL (const String &text)

Private Attributes

- ChildValues childValues_
- OStream * document_
- String indentString_
- unsigned int rightMargin_ {74}
- String indentation_
- bool addChildValues_: 1
- bool indented_: 1

9.71.1 Detailed Description

Writes a Value in JSON format in a human friendly way, to a stream rather than to a string.

The rules for line break and indent are as follow:

- Object value:
  - if empty then print {} without indent and line break
  - if not empty the print '{', line break & indent, print one value per line and then unindent and line break and print '}'.
- Array value:
  - if empty then print [] without indent and line break
  - if the array contains no object value, empty array or some other value types, and all the values fit on one lines, then print the array on a single line.
  - otherwise, it the values do not fit on one line, or the array contains object or non empty array, then print one value per line.

If the Value have comments then they are outputted according to their CommentPlacement.

See also

Reader, Value, Value::setComment()

Deprecated Use StreamWriterBuilder.

Definition at line 300 of file writer.h.

9.71.2 Member Typedef Documentation

9.71.2.1 ChildValues

```
using Json::StyledStreamWriter::ChildValues = std::vector<String>  [private]
```

Definition at line 332 of file writer.h.

9.71.3 Constructor & Destructor Documentation

9.71.3.1 StyledStreamWriter()

```
Json::StyledStreamWriter::StyledStreamWriter (
            String indentation = "\t" )
```

Parameters

indentation	Each level will be indented by this amount extra.

9.71.3.2 ~StyledStreamWriter()

```
Json::StyledStreamWriter::~StyledStreamWriter ( )  [default]
```

9.71.4 Member Function Documentation

9.71.4.1 hasCommentForValue()

```
static bool Json::StyledStreamWriter::hasCommentForValue (
            const Value & value )  [static], [private]
```

9.71.4.2 indent()

```
void Json::StyledStreamWriter::indent ( )  [private]
```

9.71.4.3 isMultilineArray()

```
bool Json::StyledStreamWriter::isMultilineArray (
            const Value & value )  [private]
```

9.71.4.4 normalizeEOL()

```
static String Json::StyledStreamWriter::normalizeEOL (
            const String & text )  [static], [private]
```

9.71.4.5 pushValue()

```
void Json::StyledStreamWriter::pushValue (
            const String & value )  [private]
```

9.71.4.6 unindent()

```
void Json::StyledStreamWriter::unindent ( )  [private]
```

9.71.4.7 write()

```
void Json::StyledStreamWriter::write (
            OStream & out,
            const Value & root )
```

Serialize a Value in JSON format.

Parameters

out	Stream to write to. (Can be ostringstream, e.g.)
root	Value to serialize.

Note

There is no point in deriving from Writer, since write() should not return a value.

9.71.4.8 writeArrayValue()

```
void Json::StyledStreamWriter::writeArrayValue (
            const Value & value )  [private]
```

9.71.4.9 writeCommentAfterValueOnSameLine()

```
void Json::StyledStreamWriter::writeCommentAfterValueOnSameLine (
            const Value & root )  [private]
```

9.71.4.10 writeCommentBeforeValue()

```
void Json::StyledStreamWriter::writeCommentBeforeValue (
            const Value & root )  [private]
```

9.71.4.11 writeIndent()

```
void Json::StyledStreamWriter::writeIndent ( )  [private]
```

9.71.4.12 writeValue()

```
void Json::StyledStreamWriter::writeValue (
            const Value & value )  [private]
```

9.71.4.13 writeWithIndent()

```
void Json::StyledStreamWriter::writeWithIndent (
            const String & value )  [private]
```

9.71.5 Field Documentation

9.71.5.1 addChildValues_

```
bool Json::StyledStreamWriter::addChildValues_  [private]
```

Definition at line 339 of file writer.h.

9.71.5.2 childValues_

```
ChildValues Json::StyledStreamWriter::childValues_  [private]
```

Definition at line 334 of file writer.h.

9.71.5.3 document_

```
OStream* Json::StyledStreamWriter::document_  [private]
```

Definition at line 335 of file writer.h.

9.71.5.4 indentation_

```
String Json::StyledStreamWriter::indentation_  [private]
```

Definition at line 338 of file writer.h.

9.71.5.5 indented_

```
bool Json::StyledStreamWriter::indented_  [private]
```

Definition at line 340 of file writer.h.

9.71.5.6 indentString_

```
String Json::StyledStreamWriter::indentString_  [private]
```

Definition at line 336 of file writer.h.

9.71.5.7 rightMargin_

```
unsigned int Json::StyledStreamWriter::rightMargin_ {74}  [private]
```

Definition at line 337 of file writer.h.

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

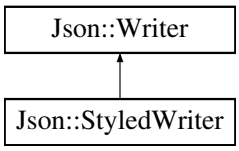
- include/jsoncpp/writer.h

9.72 Json::StyledWriter Class Reference

Writes a Value in JSON format in a human friendly way.

`#include <writer.h>`

Inheritance diagram for Json::StyledWriter:



Public Member Functions

- StyledWriter ()
- ~StyledWriter () override=default
- String write (const Value &root) override

  Serialize a Value in JSON format.

Public Member Functions inherited from Json::Writer

- virtual ~Writer ()

Private Types

- using ChildValues = std::vector< String >

Private Member Functions

- void writeValue (const Value &value)
- void writeArrayValue (const Value &value)
- bool isMultilineArray (const Value &value)
- void pushValue (const String &value)
- void writeIndent ()
- void writeWithIndent (const String &value)
- void indent ()
- void unindent ()
- void writeCommentBeforeValue (const Value &root)
- void writeCommentAfterValueOnSameLine (const Value &root)

Static Private Member Functions

- static bool hasCommentForValue (const Value &value)
- static String normalizeEOL (const String &text)

Private Attributes

- ChildValues childValues_
- String document_
- String indentString_
- unsigned int rightMargin_ {74}
- unsigned int indentSize_ {3}
- bool addChildValues_ {false}

9.72.1 Detailed Description

Writes a Value in JSON format in a human friendly way.

The rules for line break and indent are as follow:

- Object value:
  - if empty then print {} without indent and line break
  - if not empty the print '{', line break & indent, print one value per line and then unindent and line break and print '}'.
- Array value:
  - if empty then print [] without indent and line break
  - if the array contains no object value, empty array or some other value types, and all the values fit on one lines, then print the array on a single line.
  - otherwise, it the values do not fit on one line, or the array contains object or non empty array, then print one value per line.

If the Value have comments then they are outputted according to their CommentPlacement.

See also

Reader, Value, Value::setComment()

Deprecated Use StreamWriterBuilder.

Definition at line 231 of file writer.h.

9.72.2 Member Typedef Documentation

9.72.2.1 ChildValues

```
using Json::StyledWriter::ChildValues = std::vector<String>  [private]
```

Definition at line 258 of file writer.h.

9.72.3 Constructor & Destructor Documentation

9.72.3.1 StyledWriter()

```
Json::StyledWriter::StyledWriter ( )
```

9.72.3.2 ~StyledWriter()

```
Json::StyledWriter::~StyledWriter ( )  [override], [default]
```

9.72.4 Member Function Documentation

9.72.4.1 hasCommentForValue()

```
static bool Json::StyledWriter::hasCommentForValue (
            const Value & value )  [static], [private]
```

9.72.4.2 indent()

```
void Json::StyledWriter::indent ( )  [private]
```

9.72.4.3 isMultilineArray()

```
bool Json::StyledWriter::isMultilineArray (
            const Value & value )  [private]
```

9.72.4.4 normalizeEOL()

```
static String Json::StyledWriter::normalizeEOL (
            const String & text )  [static], [private]
```

9.72.4.5 pushValue()

```
void Json::StyledWriter::pushValue (
            const String & value )  [private]
```

9.72.4.6 unindent()

```
void Json::StyledWriter::unindent ( )  [private]
```

9.72.4.7 write()

```
String Json::StyledWriter::write (
            const Value & root )  [override], [virtual]
```

Serialize a Value in JSON format.

Parameters

root	Value to serialize.

Returns

String containing the JSON document that represents the root value.

Implements Json::Writer.

9.72.4.8 writeArrayValue()

```
void Json::StyledWriter::writeArrayValue (
            const Value & value )  [private]
```

9.72.4.9 writeCommentAfterValueOnSameLine()

```
void Json::StyledWriter::writeCommentAfterValueOnSameLine (
            const Value & root )  [private]
```

9.72.4.10 writeCommentBeforeValue()

```
void Json::StyledWriter::writeCommentBeforeValue (
            const Value & root )  [private]
```

9.72.4.11 writeIndent()

```
void Json::StyledWriter::writeIndent ( )  [private]
```

9.72.4.12 writeValue()

```
void Json::StyledWriter::writeValue (
            const Value & value )  [private]
```

9.72.4.13 writeWithIndent()

```
void Json::StyledWriter::writeWithIndent (
            const String & value )  [private]
```

9.72.5 Field Documentation

9.72.5.1 addChildValues_

```
bool Json::StyledWriter::addChildValues_ {false}  [private]
```

Definition at line 265 of file writer.h.

9.72.5.2 childValues_

```
ChildValues Json::StyledWriter::childValues_  [private]
```

Definition at line 260 of file writer.h.

9.72.5.3 document_

```
String Json::StyledWriter::document_  [private]
```

Definition at line 261 of file writer.h.

9.72.5.4 indentSize_

```
unsigned int Json::StyledWriter::indentSize_ {3}  [private]
```

Definition at line 264 of file writer.h.

9.72.5.5 indentString_

```
String Json::StyledWriter::indentString_  [private]
```

Definition at line 262 of file writer.h.

9.72.5.6 rightMargin_

```
unsigned int Json::StyledWriter::rightMargin_ {74}  [private]
```

Definition at line 263 of file writer.h.

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

- include/jsoncpp/writer.h

9.73 el::base::SubsecondPrecision Class Reference

A subsecond precision class containing actual width and offset of the subsecond part.

```
#include <easylogging++.h>
```

Public Member Functions

- SubsecondPrecision (void)
- SubsecondPrecision (int width)
- bool operator== (const SubsecondPrecision &ssPrec)

Data Fields

- int m_width
- unsigned int m_offset

Private Member Functions

- void init (int width)

9.73.1 Detailed Description

A subsecond precision class containing actual width and offset of the subsecond part.

Definition at line 834 of file easylogging++.h.

9.73.2 Constructor & Destructor Documentation

9.73.2.1 SubsecondPrecision() [1/2]

```
el::base::SubsecondPrecision::SubsecondPrecision (
            void  )  [inline]
```

Definition at line 836 of file easylogging++.h.

References init(), and el::base::consts::kDefaultSubsecondPrecision.

9.73.2.2 SubsecondPrecision() [2/2]

```
el::base::SubsecondPrecision::SubsecondPrecision (
            int width )  [inline], [explicit]
```

Definition at line 839 of file easylogging++.h.

References init().

9.73.3 Member Function Documentation

9.73.3.1 init()

```
void el::base::SubsecondPrecision::init (
            int width )  [private]
```

Definition at line 1404 of file easylogging++.cc.

References el::base::consts::kDefaultSubsecondPrecision, m_offset, and m_width.

9.73.3.2 operator==()

```
bool el::base::SubsecondPrecision::operator== (
             const SubsecondPrecision & ssPrec )  [inline]
```

Definition at line 842 of file easylogging++.h.

References m_offset, and m_width.

9.73.4 Field Documentation

9.73.4.1 m_offset

```
unsigned int el::base::SubsecondPrecision::m_offset
```

Definition at line 846 of file easylogging++.h.

9.73.4.2 m_width

```
int el::base::SubsecondPrecision::m_width
```

Definition at line 845 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.74 el::SysLogInitializer Class Reference

Initializes syslog with process ID, options and facility. calls closelog() on d'tor.

```
#include <easylogging++.h>
```

Public Member Functions

- SysLogInitializer (const char *processIdent, int options=0, int facility=0)
- virtual ~SysLogInitializer (void)

9.74.1 Detailed Description

Initializes syslog with process ID, options and facility. calls closelog() on d'tor.

Definition at line 3633 of file easylogging++.h.

9.74.2 Constructor & Destructor Documentation

9.74.2.1 SysLogInitializer()

```
el::SysLogInitializer::SysLogInitializer (
            const char * processIdent,
            int options = 0,
            int facility = 0 )  [inline]
```

Definition at line 3635 of file easylogging++.h.

References ELPP_UNUSED.

9.74.2.2 ~SysLogInitializer()

```
virtual el::SysLogInitializer::~SysLogInitializer (
            void  )  [inline], [virtual]
```

Definition at line 3645 of file easylogging++.h.

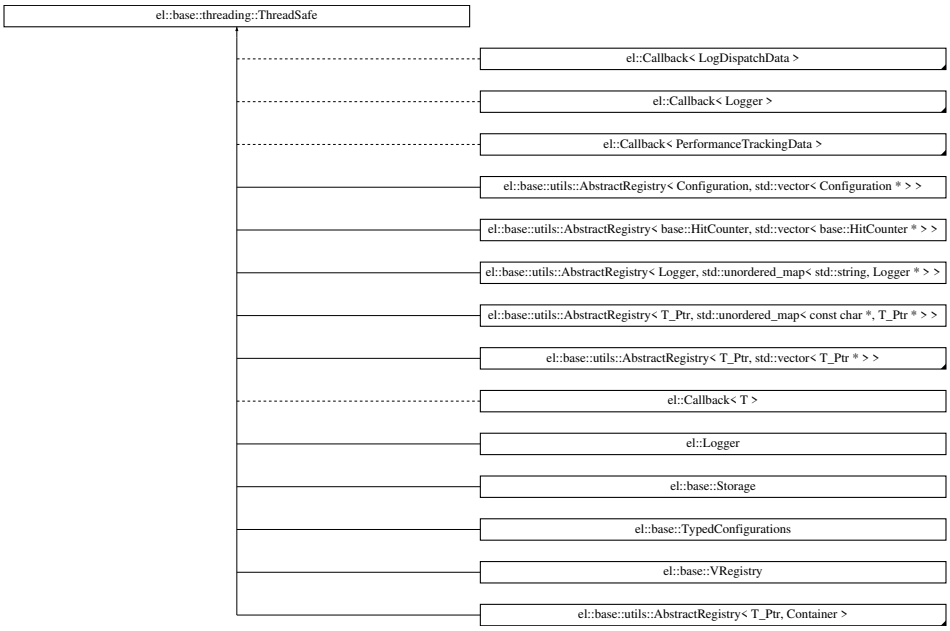
The documentation for this class was generated from the following file:

- include/easylogging++.h

9.75 el::base::threading::ThreadSafe Class Reference

Base of thread safe class, this class is inheritable-only.

Inheritance diagram for el::base::threading::ThreadSafe:



Public Member Functions

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Protected Member Functions

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

Private Attributes

- base::threading::Mutex m_mutex

9.75.1 Detailed Description

Base of thread safe class, this class is inheritable-only.

Definition at line 1002 of file easylogging++.h.

9.75.2 Constructor & Destructor Documentation

9.75.2.1 ThreadSafe()

```
el::base::threading::ThreadSafe::ThreadSafe (
            void  )  [inline], [protected]
```

Definition at line 1008 of file easylogging++.h.

9.75.2.2 ~ThreadSafe()

```
virtual el::base::threading::ThreadSafe::~ThreadSafe (
            void  )  [inline], [protected], [virtual]
```

Definition at line 1009 of file easylogging++.h.

9.75.3 Member Function Documentation

9.75.3.1 acquireLock()

```
virtual void el::base::threading::ThreadSafe::acquireLock (
            void  )  [inline], [virtual]
```

Definition at line 1004 of file easylogging++.h.

9.75.3.2 lock()

```
virtual base::threading::Mutex & el::base::threading::ThreadSafe::lock (
            void  )  [inline], [virtual]
```

Definition at line 1006 of file easylogging++.h.

9.75.3.3 releaseLock()

```
virtual void el::base::threading::ThreadSafe::releaseLock (
            void  )  [inline], [virtual]
```

Definition at line 1005 of file easylogging++.h.

9.75.4 Field Documentation

9.75.4.1 m_mutex

```
base::threading::Mutex el::base::threading::ThreadSafe::m_mutex  [private]
```

Definition at line 1011 of file easylogging++.h.

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

- include/easylogging++.h

9.76 Json::Reader::Token Class Reference

Data Fields

- TokenType type_
- Location start_
- Location end_

9.76.1 Detailed Description

Definition at line 176 of file reader.h.

9.76.2 Field Documentation

9.76.2.1 end_

```
Location Json::Reader::Token::end_
```

Definition at line 180 of file reader.h.

9.76.2.2 start_

```
Location Json::Reader::Token::start_
```

Definition at line 179 of file reader.h.

9.76.2.3 type_

```
TokenType Json::Reader::Token::type_
```

Definition at line 178 of file reader.h.

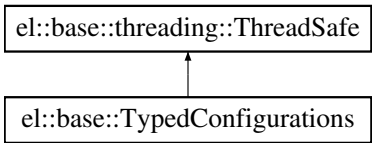
The documentation for this class was generated from the following file:

- include/jsoncpp/reader.h

9.77 el::base::TypedConfigurations Class Reference

Configurations with data types.

Inheritance diagram for el::base::TypedConfigurations:



Public Member Functions

- TypedConfigurations (Configurations *configurations, LogStreamsReferenceMapPtr logStreamsReference)
  Constructor to initialize (construct) the object off el::Configurations.
- TypedConfigurations (const TypedConfigurations &other)
- virtual ~TypedConfigurations (void)
- const Configurations * configurations (void) const
- bool enabled (Level level)
- bool toFile (Level level)
- const std::string & filename (Level level)
- bool toStandardOutput (Level level)
- const base::LogFormat & logFormat (Level level)
- const base::SubsecondPrecision & subsecondPrecision (Level level=Level::Global)
- const base::MillisecondsWidth & millisecondsWidth (Level level=Level::Global)
- bool performanceTracking (Level level=Level::Global)
- base::type::fstream_t * fileStream (Level level)
- std::size_t maxLogFileSize (Level level)
- std::size_t logFlushThreshold (Level level)

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Private Member Functions

- template<typename Conf_T >
  Conf_T getConfigByVal (Level level, const std::unordered_map< Level, Conf_T > *confMap, const char *confName)
- template<typename Conf_T >
  Conf_T & getConfigByRef (Level level, std::unordered_map< Level, Conf_T > *confMap, const char *conf↩Name)
- template<typename Conf_T >
  Conf_T unsafeGetConfigByVal (Level level, const std::unordered_map< Level, Conf_T > *confMap, const char *confName)
- template<typename Conf_T >
  Conf_T & unsafeGetConfigByRef (Level level, std::unordered_map< Level, Conf_T > *confMap, const char *confName)
- template<typename Conf_T >
  void setValue (Level level, const Conf_T &value, std::unordered_map< Level, Conf_T > *confMap, bool includeGlobalLevel=true)
- void build (Configurations *configurations)
- unsigned long getULong (std::string confVal)
- std::string resolveFilename (const std::string &filename)
- void insertFile (Level level, const std::string &fullFilename)
- bool unsafeValidateFileRolling (Level level, const PreRollOutCallback &preRollOutCallback)
- bool validateFileRolling (Level level, const PreRollOutCallback &preRollOutCallback)

Private Attributes

- Configurations * m_configurations
- std::unordered_map< Level, bool > m_enabledMap
- std::unordered_map< Level, bool > m_toFileMap
- std::unordered_map< Level, std::string > m_filenameMap
- std::unordered_map< Level, bool > m_toStandardOutputMap
- std::unordered_map< Level, base::LogFormat > m_logFormatMap
- std::unordered_map< Level, base::SubsecondPrecision > m_subsecondPrecisionMap
- std::unordered_map< Level, bool > m_performanceTrackingMap
- std::unordered_map< Level, base::FileStreamPtr > m_fileStreamMap
- std::unordered_map< Level, std::size_t > m_maxLogFileSizeMap
- std::unordered_map< Level, std::size_t > m_logFlushThresholdMap
- LogStreamsReferenceMapPtr m_logStreamsReference = nullptr

Friends

- class el::Helpers
- class el::base::MessageBuilder
- class el::base::Writer
- class el::base::DefaultLogDispatchCallback
- class el::base::LogDispatcher

Additional Inherited Members

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

9.77.1 Detailed Description

Configurations with data types.

@detail el::Configurations have string based values. This is whats used internally in order to read correct configurations. This is to perform faster while writing logs using correct configurations.

This is thread safe and final class containing non-virtual destructor (means nothing should inherit this class)

Definition at line 1904 of file easylogging++.h.

9.77.2 Constructor & Destructor Documentation

9.77.2.1 TypedConfigurations() [1/2]

```
el::base::TypedConfigurations::TypedConfigurations (
            Configurations * configurations,
            LogStreamsReferenceMapPtr logStreamsReference )
```

Constructor to initialize (construct) the object off el::Configurations.

Parameters

configurations	Configurations pointer/reference to base this typed configurations off.
logStreamsReference	Use ELPP->registeredLoggers()->logStreamsReference()

Definition at line 1613 of file easylogging++.cc.

References build(), configurations(), m_configurations, and m_logStreamsReference.

9.77.2.2 TypedConfigurations() [2/2]

```
el::base::TypedConfigurations::TypedConfigurations (
            const TypedConfigurations & other )
```

Definition at line 1620 of file easylogging++.cc.

References build(), m_configurations, and m_logStreamsReference.

9.77.2.3 ~TypedConfigurations()

```
virtual el::base::TypedConfigurations::~TypedConfigurations (
            void  )  [inline], [virtual]
```

Definition at line 1913 of file easylogging++.h.

9.77.3 Member Function Documentation

9.77.3.1 build()

```
void el::base::TypedConfigurations::build (
            Configurations * configurations )  [private]
```

Definition at line 1670 of file easylogging++.cc.

References el::base::utils::AbstractRegistry< T_Ptr, Container >::begin(), configurations(), el::Configuration::configurationType(), el::base::defaultPreRollOutCallback(), el::Enabled, el::base::utils::AbstractRegistry< T_Ptr, Container >::end(), el::Filename, el::Format, getULong(), el::Global, insertFile(), el::Configuration::level(), el::base::threading::ThreadSafe::lock(), el::LogFlushThreshold, m_enabledMap, m_logFlushThresholdMap, m_logFormatMap, m_maxLogFileSizeMap, m_performanceTrackingMap, m_subsecondPrecisionMap, m_toFileMap, m_toStandardOutputMap, el::MaxLogFileSize, el::PerformanceTracking, setValue(), el::SubsecondPrecision, el::ToFile, el::ToStandardOutput, el::base::utils::Str::trim(), unsafeValidateFileRolling(), and el::Configuration::value().

9.77.3.2 configurations()

```
const Configurations * el::base::TypedConfigurations::configurations (
            void  ) const  [inline]
```

Definition at line 1916 of file easylogging++.h.

9.77.3.3 enabled()

```
bool el::base::TypedConfigurations::enabled (
            Level level )
```

Definition at line 1626 of file easylogging++.cc.

References m_enabledMap.

9.77.3.4 filename()

```
const std::string & el::base::TypedConfigurations::filename (
            Level level )
```

Definition at line 1634 of file easylogging++.cc.

References m_filenameMap.

9.77.3.5 fileStream()

```
base::type::fstream_t * el::base::TypedConfigurations::fileStream (
            Level level )
```

Definition at line 1658 of file easylogging++.cc.

References m_fileStreamMap.

9.77.3.6 getConfigByRef()

```
template<typename Conf_T >
Conf_T & el::base::TypedConfigurations::getConfigByRef (
            Level level,
            std::unordered_map< Level, Conf_T > * confMap,
            const char * confName )  [inline], [private]
```

Definition at line 1959 of file easylogging++.h.

9.77.3.7 getConfigByVal()

```
template<typename Conf_T >
Conf_T el::base::TypedConfigurations::getConfigByVal (
            Level level,
            const std::unordered_map< Level, Conf_T > * confMap,
            const char * confName )  [inline], [private]
```

Definition at line 1953 of file easylogging++.h.

9.77.3.8 getULong()

```
unsigned long el::base::TypedConfigurations::getULong (
            std::string confVal )  [private]
```

Definition at line 1724 of file easylogging++.cc.

References ELPP_ASSERT, and el::base::utils::Str::trim().

9.77.3.9 insertFile()

```
void el::base::TypedConfigurations::insertFile (
            Level level,
            const std::string & fullFilename )  [private]
```

Definition at line 1778 of file easylogging++.cc.

References el::LevelHelper::convertToString(), el::base::utils::File::createPath(), ELPP_INTERNAL_ERROR, el::base::utils::File::extractPathFromFilename(), el::Global, el::base::consts::kFilePathSeparator, m_filenameMap, m_fileStreamMap, m_logStreamsReference, m_toFileMap, el::base::utils::File::newFileStream(), resolveFilename(), and setValue().

9.77.3.10 logFlushThreshold()

```
std::size_t el::base::TypedConfigurations::logFlushThreshold (
            Level level )
```

Definition at line 1666 of file easylogging++.cc.

References m_logFlushThresholdMap.

9.77.3.11 logFormat()

```
const base::LogFormat & el::base::TypedConfigurations::logFormat (
            Level level )
```

Definition at line 1642 of file easylogging++.cc.

References m_logFormatMap.

9.77.3.12 maxLogFileSize()

```
std::size_t el::base::TypedConfigurations::maxLogFileSize (
            Level level )
```

Definition at line 1662 of file easylogging++.cc.

References m_maxLogFileSizeMap.

9.77.3.13 millisecondsWidth()

```
const base::MillisecondsWidth & el::base::TypedConfigurations::millisecondsWidth (
            Level level = Level::Global )
```

Definition at line 1650 of file easylogging++.cc.

References m_subsecondPrecisionMap.

9.77.3.14 performanceTracking()

```
bool el::base::TypedConfigurations::performanceTracking (
            Level level = Level::Global )
```

Definition at line 1654 of file easylogging++.cc.

References m_performanceTrackingMap.

9.77.3.15 resolveFilename()

```
std::string el::base::TypedConfigurations::resolveFilename (
            const std::string & filename )  [private]
```

Definition at line 1739 of file easylogging++.cc.

References filename(), el::base::utils::DateTime::getDateTime(), el::base::consts::kDateTimeFormatSpecifierForFilename, el::base::consts::kDefaultDateTimeFormatInFilename, el::base::consts::kFormatSpecifierChar, and el::base::utils::Str::replaceAll().

9.77.3.16 setValue()

```
template<typename Conf_T >
void el::base::TypedConfigurations::setValue (
            Level level,
            const Conf_T & value,
            std::unordered_map< Level, Conf_T > * confMap,
            bool includeGlobalLevel = true )  [inline], [private]
```

Definition at line 1998 of file easylogging++.h.

9.77.3.17 subsecondPrecision()

```
const base::SubsecondPrecision & el::base::TypedConfigurations::subsecondPrecision (
            Level level = Level::Global )
```

Definition at line 1646 of file easylogging++.cc.

References m_subsecondPrecisionMap.

9.77.3.18 toFile()

```
bool el::base::TypedConfigurations::toFile (
            Level level )
```

Definition at line 1630 of file easylogging++.cc.

References m_toFileMap.

9.77.3.19 toStandardOutput()

```
bool el::base::TypedConfigurations::toStandardOutput (
            Level level )
```

Definition at line 1638 of file easylogging++.cc.

References m_toStandardOutputMap.

9.77.3.20 unsafeGetConfigByRef()

```
template<typename Conf_T >
Conf_T & el::base::TypedConfigurations::unsafeGetConfigByRef (
             Level level,
             std::unordered_map< Level, Conf_T > * confMap,
             const char * confName )  [inline], [private]
```

Definition at line 1982 of file easylogging++.h.

References ELPP_INTERNAL_ERROR, and ELPP_UNUSED.

9.77.3.21 unsafeGetConfigByVal()

```
template<typename Conf_T >
Conf_T el::base::TypedConfigurations::unsafeGetConfigByVal (
             Level level,
             const std::unordered_map< Level, Conf_T > * confMap,
             const char * confName )  [inline], [private]
```

Definition at line 1965 of file easylogging++.h.

References ELPP_INTERNAL_ERROR, and ELPP_UNUSED.

9.77.3.22 unsafeValidateFileRolling()

```
bool el::base::TypedConfigurations::unsafeValidateFileRolling (
             Level level,
             const PreRollOutCallback & preRollOutCallback )  [private]
```

Definition at line 1815 of file easylogging++.cc.

References el::LevelHelper::convertToString(), ELPP_INTERNAL_INFO, el::base::utils::File::getSizeOfFile(), m_filenameMap, m_fileStreamMap, m_maxLogFileSizeMap, maxLogFileSize(), unsafeGetConfigByRef(), and unsafeGetConfigByVal().

9.77.3.23 validateFileRolling()

```
bool el::base::TypedConfigurations::validateFileRolling (
             Level level,
             const PreRollOutCallback & preRollOutCallback )  [inline], [private]
```

Definition at line 2027 of file easylogging++.h.

9.77.4 Friends And Related Symbol Documentation

9.77.4.1 el::base::DefaultLogDispatchCallback

```
friend class el::base::DefaultLogDispatchCallback  [friend]
```

Definition at line 1949 of file easylogging++.h.

9.77.4.2 el::base::LogDispatcher

```
friend class el::base::LogDispatcher  [friend]
```

Definition at line 1950 of file easylogging++.h.

9.77.4.3 el::base::MessageBuilder

```
friend class el::base::MessageBuilder  [friend]
```

Definition at line 1947 of file easylogging++.h.

9.77.4.4 el::base::Writer

```
friend class el::base::Writer  [friend]
```

Definition at line 1948 of file easylogging++.h.

9.77.4.5 el::Helpers

```
friend class el::Helpers  [friend]
```

Definition at line 1946 of file easylogging++.h.

9.77.5 Field Documentation

9.77.5.1 m_configurations

```
Configurations* el::base::TypedConfigurations::m_configurations  [private]
```

Definition at line 1933 of file easylogging++.h.

9.77.5.2 m_enabledMap

```
std::unordered_map<Level, bool> el::base::TypedConfigurations::m_enabledMap  [private]
```

Definition at line 1934 of file easylogging++.h.

9.77.5.3 m_filenameMap

```
std::unordered_map<Level, std::string> el::base::TypedConfigurations::m_filenameMap  [private]
```

Definition at line 1936 of file easylogging++.h.

9.77.5.4 m_fileStreamMap

```
std::unordered_map<Level, base::FileStreamPtr> el::base::TypedConfigurations::m_fileStreamMap
[private]
```

Definition at line 1941 of file easylogging++.h.

9.77.5.5 m_logFlushThresholdMap

```
std::unordered_map<Level, std::size_t> el::base::TypedConfigurations::m_logFlushThresholdMap
[private]
```

Definition at line 1943 of file easylogging++.h.

9.77.5.6 m_logFormatMap

```
std::unordered_map<Level, base::LogFormat> el::base::TypedConfigurations::m_logFormatMap
[private]
```

Definition at line 1938 of file easylogging++.h.

9.77.5.7 m_logStreamsReference

```
LogStreamsReferenceMapPtr el::base::TypedConfigurations::m_logStreamsReference = nullptr  [private]
```

Definition at line 1944 of file easylogging++.h.

9.77.5.8 m_maxLogFileSizeMap

```
std::unordered_map<Level, std::size_t> el::base::TypedConfigurations::m_maxLogFileSizeMap
[private]
```

Definition at line 1942 of file easylogging++.h.

9.77.5.9 m_performanceTrackingMap

```
std::unordered_map<Level, bool> el::base::TypedConfigurations::m_performanceTrackingMap  [private]
```

Definition at line 1940 of file easylogging++.h.

9.77.5.10 m_subsecondPrecisionMap

```
std::unordered_map<Level, base::SubsecondPrecision> el::base::TypedConfigurations::m_subsecond↩
PrecisionMap  [private]
```

Definition at line 1939 of file easylogging++.h.

9.77.5.11 m_toFileMap

```
std::unordered_map<Level, bool> el::base::TypedConfigurations::m_toFileMap  [private]
```

Definition at line 1935 of file easylogging++.h.

9.77.5.12 m_toStandardOutputMap

```
std::unordered_map<Level, bool> el::base::TypedConfigurations::m_toStandardOutputMap  [private]
```

Definition at line 1937 of file easylogging++.h.

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

- include/easylogging++.h
- lib/easylogging++.cc

9.78 el::base::utils::Utils Class Reference

Static Public Member Functions

- template<typename T , typename TPtr >
  static bool installCallback (const std::string &id, std::unordered_map< std::string, TPtr > *mapT)
- template<typename T , typename TPtr >
  static void uninstallCallback (const std::string &id, std::unordered_map< std::string, TPtr > *mapT)
- template<typename T , typename TPtr >
  static T * callback (const std::string &id, std::unordered_map< std::string, TPtr > *mapT)

9.78.1 Detailed Description

Definition at line 1531 of file easylogging++.h.

9.78.2 Member Function Documentation

9.78.2.1 callback()

```
template<typename T , typename TPtr >
static T * el::base::utils::Utils::callback (
            const std::string & id,
            std::unordered_map< std::string, TPtr > * mapT )  [inline], [static]
```

Definition at line 1550 of file easylogging++.h.

9.78.2.2 installCallback()

```
template<typename T , typename TPtr >
static bool el::base::utils::Utils::installCallback (
             const std::string & id,
             std::unordered_map< std::string, TPtr > * mapT )  [inline], [static]
```

Definition at line 1534 of file easylogging++.h.

9.78.2.3 uninstallCallback()

```
template<typename T , typename TPtr >
static void el::base::utils::Utils::uninstallCallback (
             const std::string & id,
             std::unordered_map< std::string, TPtr > * mapT )  [inline], [static]
```

Definition at line 1543 of file easylogging++.h.

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

- include/easylogging++.h

9.79 Json::Value Class Reference

Represents a JSON value.

```
#include <value.h>
```

Data Structures

- class Comments
- class CZString
- union ValueHolder

Public Types

- using Members = std::vector< String >
- using iterator = ValueIterator
- using const_iterator = ValueConstIterator
- using UInt = Json::UInt
- using Int = Json::Int
- using UInt64 = Json::UInt64
- using Int64 = Json::Int64
- using LargestInt = Json::LargestInt
- using LargestUInt = Json::LargestUInt
- using ArrayIndex = Json::ArrayIndex
- using value_type = std::string
- typedef std::map< CZString, Value > ObjectValues

Public Member Functions

- Value (ValueType type=nullValue)

  Create a default Value of the given type.
- Value (Int value)
- Value (UInt value)
- Value (Int64 value)
- Value (UInt64 value)
- Value (double value)
- Value (const char *value)

  Copy til first 0. (NULL causes to seg-fault.)
- Value (const char *begin, const char *end)

  Copy all, incl zeroes.
- Value (const StaticString &value)

  Constructs a value from a static string.
- Value (const String &value)
- Value (bool value)
- Value (std::nullptr_t ptr)=delete
- Value (const Value &other)
- Value (Value &&other) noexcept
- ~Value ()
- Value & operator= (const Value &other)
- Value & operator= (Value &&other) noexcept
- void swap (Value &other)

  Swap everything.
- void swapPayload (Value &other)

  Swap values but leave comments and source offsets in place.
- void copy (const Value &other)

  copy everything.
- void copyPayload (const Value &other)

  copy values but leave comments and source offsets in place.
- ValueType type () const
- bool operator< (const Value &other) const

  Compare payload only, not comments etc.
- bool operator<= (const Value &other) const
- bool operator>= (const Value &other) const
- bool operator> (const Value &other) const
- bool operator== (const Value &other) const
- bool operator!= (const Value &other) const
- int compare (const Value &other) const
- const char * asCString () const

  Embedded zeroes could cause you trouble!
- String asString () const

  Embedded zeroes are possible.
- bool getString (char const **begin, char const **end) const
- Int asInt () const
- UInt asUInt () const
- Int64 asInt64 () const
- UInt64 asUInt64 () const
- LargestInt asLargestInt () const
- LargestUInt asLargestUInt () const
- float asFloat () const
- double asDouble () const

- bool asBool () const
- bool isNull () const
- bool isBool () const
- bool isInt () const
- bool isInt64 () const
- bool isUInt () const
- bool isUInt64 () const
- bool isIntegral () const
- bool isDouble () const
- bool isNumeric () const
- bool isString () const
- bool isArray () const
- bool isObject () const
- template<typename T >
  T as () const JSONCPP_TEMPLATE_DELETE

  The `as<T>` and `is<T>` member function templates and specializations.
- template<typename T >
  bool is () const JSONCPP_TEMPLATE_DELETE
- bool isConvertibleTo (ValueType other) const
- ArrayIndex size () const

  Number of values in array or object.
- bool empty () const

  Return true if empty array, empty object, or null; otherwise, false.
- operator bool () const

  Return !isNull()
- void clear ()
- void resize (ArrayIndex newSize)
- Value get (ArrayIndex index, const Value &defaultValue) const
- bool isValidIndex (ArrayIndex index) const

  Return true if index < size().
- Value & append (const Value &value)

  Append value to array at the end.
- Value & append (Value &&value)
- bool insert (ArrayIndex index, const Value &newValue)

  Insert value in array at specific index.
- bool insert (ArrayIndex index, Value &&newValue)
- Value & operator[ ] (const char *key)
- const Value & operator[ ] (const char *key) const
- Value & operator[ ] (const String &key)
- const Value & operator[ ] (const String &key) const
- Value & operator[ ] (const StaticString &key)

  Access an object value by name, create a null member if it does not exist.
- Value get (const char *key, const Value &defaultValue) const
- Value get (const char *begin, const char *end, const Value &defaultValue) const
- Value get (const String &key, const Value &defaultValue) const
- Value const * find (char const *begin, char const *end) const
- Value * demand (char const *begin, char const *end)
- void removeMember (const char *key)

  Remove and return the named member.
- void removeMember (const String &key)
- bool removeMember (const char *key, Value *removed)
- bool removeMember (String const &key, Value *removed)

  Remove the named map member.

- bool removeMember (const char *begin, const char *end, Value *removed)

  Same as removeMember(String const& key, Value removed)*
- bool removeIndex (ArrayIndex index, Value *removed)

  Remove the indexed array element.
- bool isMember (const char *key) const
- bool isMember (const String &key) const
- bool isMember (const char *begin, const char *end) const

  Same as isMember(String const& key)const.
- Members getMemberNames () const

  Return a list of the member names.
- void setComment (const char *comment, CommentPlacement placement)
- void setComment (const char *comment, size_t len, CommentPlacement placement)

  Comments must be //... or / ... */.*
- void setComment (String comment, CommentPlacement placement)

  Comments must be //... or / ... */.*
- bool hasComment (CommentPlacement placement) const
- String getComment (CommentPlacement placement) const

  Include delimiters and embedded newlines.
- String toStyledString () const
- const_iterator begin () const
- const_iterator end () const
- iterator begin ()
- iterator end ()
- const Value & front () const

  Returns a reference to the first element in the `Value`. Requires that this value holds an array or json object, with at least one element.
- Value & front ()

  Returns a reference to the first element in the `Value`. Requires that this value holds an array or json object, with at least one element.
- const Value & back () const

  Returns a reference to the last element in the `Value`. Requires that value holds an array or json object, with at least one element.
- Value & back ()

  Returns a reference to the last element in the `Value`. Requires that this value holds an array or json object, with at least one element.
- void setOffsetStart (ptrdiff_t start)
- void setOffsetLimit (ptrdiff_t limit)
- ptrdiff_t getOffsetStart () const
- ptrdiff_t getOffsetLimit () const
- template<> bool as () const
- template<> bool is () const
- template<> Int as () const
- template<> bool is () const
- template<> UInt as () const
- template<> bool is () const
- template<> Int64 as () const
- template<> bool is () const
- template<> UInt64 as () const
- template<> bool is () const
- template<> double as () const
- template<> bool is () const
- template<> String as () const
- template<> bool is () const

- template<> float as () const
- template<> const char * as () const

- Value & operator[] (ArrayIndex index)
- Value & operator[] (int index)

- const Value & operator[] (ArrayIndex index) const
- const Value & operator[] (int index) const

Static Public Member Functions

- static Value const & nullSingleton ()

Static Public Attributes

- static const Value & null
- static const Value & nullRef
- static constexpr LargestInt minLargestInt

  Minimum signed integer value that can be stored in a Json::Value.
- static constexpr LargestInt maxLargestInt = LargestInt(LargestUInt(-1) / 2)

  Maximum signed integer value that can be stored in a Json::Value.
- static constexpr LargestUInt maxLargestUInt = LargestUInt(-1)

  Maximum unsigned integer value that can be stored in a Json::Value.
- static constexpr Int minInt = Int(~(UInt(-1) / 2))

  Minimum signed int value that can be stored in a Json::Value.
- static constexpr Int maxInt = Int(UInt(-1) / 2)

  Maximum signed int value that can be stored in a Json::Value.
- static constexpr UInt maxUInt = UInt(-1)

  Maximum unsigned int value that can be stored in a Json::Value.
- static constexpr Int64 minInt64 = Int64(~(UInt64(-1) / 2))

  Minimum signed 64 bits int value that can be stored in a Json::Value.
- static constexpr Int64 maxInt64 = Int64(UInt64(-1) / 2)

  Maximum signed 64 bits int value that can be stored in a Json::Value.
- static constexpr UInt64 maxUInt64 = UInt64(-1)

  Maximum unsigned 64 bits int value that can be stored in a Json::Value.
- static constexpr UInt defaultRealPrecision = 17

  Default precision for real value for string representation.
- static constexpr double maxUInt64AsDouble = 18446744073709551615.0

Private Member Functions

- void setType (ValueType v)
- bool isAllocated () const
- void setIsAllocated (bool v)
- void initBasic (ValueType type, bool allocated=false)
- void dupPayload (const Value &other)
- void releasePayload ()
- void dupMeta (const Value &other)
- Value & resolveReference (const char *key)
- Value & resolveReference (const char *key, const char *end)

Private Attributes

- union Json::Value::ValueHolder value_
- struct {
  unsigned int value_type_ : 8
  unsigned int allocated_ : 1
  } bits_
- Comments comments_
- ptrdiff_t start_
- ptrdiff_t limit_

Friends

- class ValueIteratorBase

9.79.1 Detailed Description

Represents a JSON value.

This class is a discriminated union wrapper that can represents a:

- signed integer [range: Value::minInt - Value::maxInt]
- unsigned integer (range: 0 - Value::maxUInt)
- double
- UTF-8 string
- boolean
- 'null'
- an ordered list of Value
- collection of name/value pairs (javascript object)

The type of the held value is represented by a ValueType and can be obtained using type().

Values of an objectValue or arrayValue can be accessed using operator[]() methods. Non-const methods will automatically create the a nullValue element if it does not exist. The sequence of an arrayValue will be automatically resized and initialized with nullValue. resize() can be used to enlarge or truncate an arrayValue.

The get() methods can be used to obtain default value in the case the required element does not exist.

It is possible to iterate over the list of member keys of an object using the getMemberNames() method.

Note

Value string-length fit in size_t, but keys must be $< 2^{\wedge}30$. (The reason is an implementation detail.) A #↩ CharReader will raise an exception if a bound is exceeded to avoid security holes in your app, but the Value API does *not* check bounds. That is the responsibility of the caller.

Definition at line 198 of file value.h.

9.79.2 Member Typedef Documentation

9.79.2.1 ArrayIndex

```
using Json::Value::ArrayIndex = Json::ArrayIndex
```

Definition at line 213 of file value.h.

9.79.2.2 const_iterator

```
using Json::Value::const_iterator = ValueConstIterator
```

Definition at line 204 of file value.h.

9.79.2.3 Int

```
using Json::Value::Int = Json::Int
```

Definition at line 206 of file value.h.

9.79.2.4 Int64

```
using Json::Value::Int64 = Json::Int64
```

Definition at line 209 of file value.h.

9.79.2.5 iterator

```
using Json::Value::iterator = ValueIterator
```

Definition at line 203 of file value.h.

9.79.2.6 LargestInt

```
using Json::Value::LargestInt = Json::LargestInt
```

Definition at line 211 of file value.h.

9.79.2.7 LargestUInt

```
using Json::Value::LargestUInt = Json::LargestUInt
```

Definition at line 212 of file value.h.

9.79.2.8 Members

```
using Json::Value::Members = std::vector<String>
```

Definition at line 202 of file value.h.

9.79.2.9 ObjectValues

```
typedef std::map<CZString, Value> Json::Value::ObjectValues
```

Definition at line 300 of file value.h.

9.79.2.10 UInt

```
using Json::Value::UInt = Json::UInt
```

Definition at line 205 of file value.h.

9.79.2.11 UInt64

```
using Json::Value::UInt64 = Json::UInt64
```

Definition at line 208 of file value.h.

9.79.2.12 value_type

```
using Json::Value::value_type = std::string
```

Definition at line 216 of file value.h.

9.79.3 Constructor & Destructor Documentation

9.79.3.1 Value() [1/14]

```
Json::Value::Value (
            ValueType type = nullValue )
```

Create a default Value of the given type.

This is a very useful constructor. To create an empty array, pass arrayValue. To create an empty object, pass objectValue. Another Value can then be set to this one by assignment. This is useful since clear() and resize() will not alter types.

Examples:

```
Json::Value null_value; // null
Json::Value arr_value(Json::arrayValue); // []
Json::Value obj_value(Json::objectValue); // {}
```

9.79.3.2 Value() [2/14]

```
Json::Value::Value (
            Int value )
```

9.79.3.3 Value() [3/14]

```
Json::Value::Value (
            UInt value )
```

9.79.3.4 Value() [4/14]

```
Json::Value::Value (
            Int64 value )
```

9.79.3.5 Value() [5/14]

```
Json::Value::Value (
            UInt64 value )
```

9.79.3.6 Value() [6/14]

```
Json::Value::Value (
            double value )
```

9.79.3.7 Value() [7/14]

```
Json::Value::Value (
            const char * value )
```

Copy til first 0. (NULL causes to seg-fault.)

9.79.3.8 Value() [8/14]

```
Json::Value::Value (
            const char * begin,
            const char * end )
```

Copy all, incl zeroes.

9.79.3.9 Value() [9/14]

```
Json::Value::Value (
            const StaticString & value )
```

Constructs a value from a static string.

Like other value string constructor but do not duplicate the string for internal storage. The given string must remain alive after the call to this constructor.

Note

This works only for null-terminated strings. (We cannot change the size of this class, so we have nowhere to store the length, which might be computed later for various operations.)

Example of usage:

```
static StaticString foo("some text");
Json::Value aValue(foo);
```

9.79.3.10 Value() [10/14]

```
Json::Value::Value (
            const String & value )
```

9.79.3.11 Value() [11/14]

```
Json::Value::Value (
            bool value )
```

9.79.3.12 Value() [12/14]

```
Json::Value::Value (
            std::nullptr_t ptr )  [delete]
```

9.79.3.13 Value() [13/14]

```
Json::Value::Value (
            const Value & other )
```

9.79.3.14 Value() [14/14]

```
Json::Value::Value (
            Value && other )  [noexcept]
```

9.79.3.15 ~Value()

```
Json::Value::~Value ( )
```

9.79.4 Member Function Documentation

9.79.4.1 append() [1/2]

```
Value & Json::Value::append (
            const Value & value )
```

Append value to array at the end.

Equivalent to jsonvalue[jsonvalue.size()] = value;

9.79.4.2 append() [2/2]

```
Value & Json::Value::append (
            Value && value )
```

9.79.4.3 as() [1/10]

```
template<>
bool Json::Value::as ( ) const  [inline]
```

Definition at line 682 of file value.h.

9.79.4.4 as() [2/10]

```
template<>
Int Json::Value::as ( ) const  [inline]
```

Definition at line 689 of file value.h.

9.79.4.5 as() [3/10]

```
template<>
UInt Json::Value::as ( ) const  [inline]
```

Definition at line 696 of file value.h.

9.79.4.6 as() [4/10]

```
template<>
Int64 Json::Value::as ( ) const  [inline]
```

Definition at line 704 of file value.h.

9.79.4.7 as() [5/10]

```
template<>
UInt64 Json::Value::as ( ) const  [inline]
```

Definition at line 711 of file value.h.

9.79.4.8 as() [6/10]

```
template<>
double Json::Value::as ( ) const  [inline]
```

Definition at line 719 of file value.h.

9.79.4.9 as() [7/10]

```
template<>
String Json::Value::as ( ) const  [inline]
```

Definition at line 726 of file value.h.

9.79.4.10 as() [8/10]

```
template<>
float Json::Value::as ( ) const  [inline]
```

These `as` specializations are type conversions, and do not have a corresponding `is`.

Definition at line 735 of file value.h.

9.79.4.11 as() [9/10]

```
template<>
const char * Json::Value::as ( ) const  [inline]
```

Definition at line 738 of file value.h.

9.79.4.12 as() [10/10]

```
template<typename T >
T Json::Value::as ( ) const
```

The `as<T>` and `is<T>` member function templates and specializations.

9.79.4.13 asBool()

```
bool Json::Value::asBool ( ) const
```

9.79.4.14 asCString()

```
const char * Json::Value::asCString ( ) const
```

Embedded zeroes could cause you trouble!

9.79.4.15 asDouble()

```
double Json::Value::asDouble ( ) const
```

9.79.4.16 asFloat()

```
float Json::Value::asFloat ( ) const
```

9.79.4.17 asInt()

```
Int Json::Value::asInt ( ) const
```

9.79.4.18 asInt64()

```
Int64 Json::Value::asInt64 ( ) const
```

9.79.4.19 asLargestInt()

```
LargestInt Json::Value::asLargestInt ( ) const
```

9.79.4.20 asLargestUInt()

```
LargestUInt Json::Value::asLargestUInt ( ) const
```

9.79.4.21 asString()

```
String Json::Value::asString ( ) const
```

Embedded zeroes are possible.

9.79.4.22 asUInt()

```
UInt Json::Value::asUInt ( ) const
```

9.79.4.23 asUInt64()

```
UInt64 Json::Value::asUInt64 ( ) const
```

9.79.4.24 back() [1/2]

```
Value & Json::Value::back ( )  [inline]
```

Returns a reference to the last element in the Value. Requires that this value holds an array or json object, with at least one element.

Definition at line 1008 of file value.h.

9.79.4.25 back() [2/2]

```
const Value & Json::Value::back ( ) const  [inline]
```

Returns a reference to the last element in the Value. Requires that value holds an array or json object, with at least one element.

Definition at line 1004 of file value.h.

9.79.4.26 begin() [1/2]

```
iterator Json::Value::begin ( )
```

9.79.4.27 begin() [2/2]

```
const_iterator Json::Value::begin ( ) const
```

9.79.4.28 clear()

```
void Json::Value::clear ( )
```

Remove all object members and array elements.

Precondition

type() is arrayValue, objectValue, or nullValue

Postcondition

type() is unchanged

9.79.4.29 compare()

```
int Json::Value::compare (
            const Value & other ) const
```

9.79.4.30 copy()

```
void Json::Value::copy (
            const Value & other )
```

copy everything.

9.79.4.31 copyPayload()

```
void Json::Value::copyPayload (
            const Value & other )
```

copy values but leave comments and source offsets in place.

9.79.4.32 demand()

```
Value * Json::Value::demand (
            char const * begin,
            char const * end )
```

Most general and efficient version of object-mutators.

Note

As stated elsewhere, behavior is undefined if (end-begin) >= 2^30

Returns

non-zero, but JSON_ASSERT if this is neither object nor nullValue.

9.79.4.33 dupMeta()

```
void Json::Value::dupMeta (
            const Value & other )  [private]
```

9.79.4.34 dupPayload()

```
void Json::Value::dupPayload (
            const Value & other )  [private]
```

9.79.4.35 empty()

```
bool Json::Value::empty ( ) const
```

Return true if empty array, empty object, or null; otherwise, false.

9.79.4.36 end() [1/2]

```
iterator Json::Value::end ( )
```

9.79.4.37 end() [2/2]

```
const_iterator Json::Value::end ( ) const
```

9.79.4.38 find()

```
Value const * Json::Value::find (
            char const * begin,
            char const * end ) const
```

Most general and efficient version of isMember()const, get()const, and operator[]const

Note

As stated elsewhere, behavior is undefined if (end-begin) >= 2^30

9.79.4.39 front() [1/2]

```
Value & Json::Value::front ( )  [inline]
```

Returns a reference to the first element in the `Value`. Requires that this value holds an array or json object, with at least one element.

Definition at line 1000 of file value.h.

9.79.4.40 front() [2/2]

```
const Value & Json::Value::front ( ) const  [inline]
```

Returns a reference to the first element in the `Value`. Requires that this value holds an array or json object, with at least one element.

Definition at line 996 of file value.h.

9.79.4.41 get() [1/4]

```
Value Json::Value::get (
            ArrayIndex index,
            const Value & defaultValue ) const
```

If the array contains at least index+1 elements, returns the element value, otherwise returns defaultValue.

9.79.4.42 get() [2/4]

```
Value Json::Value::get (
            const char * begin,
            const char * end,
            const Value & defaultValue ) const
```

Return the member named key if it exist, defaultValue otherwise.

Note

deep copy

key may contain embedded nulls.

9.79.4.43 get() [3/4]

```
Value Json::Value::get (
            const char * key,
            const Value & defaultValue ) const
```

Return the member named key if it exist, defaultValue otherwise.

Note

deep copy

9.79.4.44 get() [4/4]

```
Value Json::Value::get (
            const String & key,
            const Value & defaultValue ) const
```

Return the member named key if it exist, defaultValue otherwise.

Note

deep copy

Parameters

key	may contain embedded nulls.

9.79.4.45 getComment()

```
String Json::Value::getComment (
            CommentPlacement placement ) const
```

Include delimiters and embedded newlines.

9.79.4.46 getMemberNames()

```
Members Json::Value::getMemberNames ( ) const
```

Return a list of the member names.

If null, return an empty list.

Precondition

type() is objectValue or nullValue

Postcondition

if type() was nullValue, it remains nullValue

9.79.4.47 getOffsetLimit()

```
ptrdiff_t Json::Value::getOffsetLimit ( ) const
```

9.79.4.48 getOffsetStart()

```
ptrdiff_t Json::Value::getOffsetStart ( ) const
```

9.79.4.49 getString()

```
bool Json::Value::getString (
            char const ** begin,
            char const ** end ) const
```

Get raw char* of string-value.

Returns

false if !string. (Seg-fault if str or end are NULL.)

9.79.4.50 hasComment()

```
bool Json::Value::hasComment (
            CommentPlacement placement ) const
```

9.79.4.51 initBasic()

```
void Json::Value::initBasic (
            ValueType type,
            bool allocated = false )  [private]
```

9.79.4.52 insert() [1/2]

```
bool Json::Value::insert (
            ArrayIndex index,
            const Value & newValue )
```

Insert value in array at specific index.

9.79.4.53 insert() [2/2]

```
bool Json::Value::insert (
            ArrayIndex index,
            Value && newValue )
```

9.79.4.54 is() [1/8]

```
template<>
bool Json::Value::is ( ) const  [inline]
```

Definition at line 685 of file value.h.

9.79.4.55 is() [2/8]

```
template<>
bool Json::Value::is ( ) const  [inline]
```

Definition at line 692 of file value.h.

9.79.4.56 is() [3/8]

```
template<>
bool Json::Value::is ( ) const  [inline]
```

Definition at line 699 of file value.h.

9.79.4.57 is() [4/8]

```
template<>
bool Json::Value::is ( ) const  [inline]
```

Definition at line 707 of file value.h.

9.79.4.58 is() [5/8]

```
template<>
bool Json::Value::is ( ) const  [inline]
```

Definition at line 714 of file value.h.

9.79.4.59 is() [6/8]

```
template<>
bool Json::Value::is ( ) const  [inline]
```

Definition at line 722 of file value.h.

9.79.4.60 is() [7/8]

```
template<>
bool Json::Value::is ( ) const  [inline]
```

Definition at line 729 of file value.h.

9.79.4.61 is() [8/8]

```
template<typename T >
bool Json::Value::is ( ) const
```

9.79.4.62 isAllocated()

```
bool Json::Value::isAllocated ( ) const  [inline], [private]
```

Definition at line 619 of file value.h.

9.79.4.63 isArray()

```
bool Json::Value::isArray ( ) const
```

9.79.4.64 isBool()

```
bool Json::Value::isBool ( ) const
```

9.79.4.65 isConvertibleTo()

```
bool Json::Value::isConvertibleTo (
            ValueType other ) const
```

9.79.4.66 isDouble()

```
bool Json::Value::isDouble ( ) const
```

9.79.4.67 isInt()

```
bool Json::Value::isInt ( ) const
```

9.79.4.68 isInt64()

```
bool Json::Value::isInt64 ( ) const
```

9.79.4.69 isIntegral()

```
bool Json::Value::isIntegral ( ) const
```

9.79.4.70 isMember() [1/3]

```
bool Json::Value::isMember (
            const char * begin,
            const char * end ) const
```

Same as isMember(String const& key)const.

9.79.4.71 isMember() [2/3]

```
bool Json::Value::isMember (
            const char * key ) const
```

Return true if the object has a member named key.

Note

'key' must be null-terminated.

9.79.4.72 isMember() [3/3]

```
bool Json::Value::isMember (
            const String & key ) const
```

Return true if the object has a member named key.

Parameters

key	may contain embedded nulls.

9.79.4.73 isNull()

```
bool Json::Value::isNull ( ) const
```

9.79.4.74 isNumeric()

```
bool Json::Value::isNumeric ( ) const
```

9.79.4.75 isObject()

```
bool Json::Value::isObject ( ) const
```

9.79.4.76 isString()

```
bool Json::Value::isString ( ) const
```

9.79.4.77 isUInt()

```
bool Json::Value::isUInt ( ) const
```

9.79.4.78 isUInt64()

```
bool Json::Value::isUInt64 ( ) const
```

9.79.4.79 isValidIndex()

```
bool Json::Value::isValidIndex (
            ArrayIndex index ) const
```

Return true if index < size().

9.79.4.80 nullSingleton()

```
static Value const & Json::Value::nullSingleton ( )  [static]
```

9.79.4.81 operator bool()

```
Json::Value::operator bool ( ) const  [explicit]
```

Return !isNull()

9.79.4.82 operator"!=()

```
bool Json::Value::operator!= (
            const Value & other ) const
```

9.79.4.83 operator<()

```
bool Json::Value::operator< (
            const Value & other ) const
```

Compare payload only, not comments etc.

9.79.4.84 operator<=()

```
bool Json::Value::operator<= (
            const Value & other ) const
```

9.79.4.85 operator=() [1/2]

```
Value & Json::Value::operator= (
            const Value & other )
```

Note

Overwrite existing comments. To preserve comments, use swapPayload().

9.79.4.86 operator=() [2/2]

```
Value & Json::Value::operator= (
            Value && other )  [noexcept]
```

9.79.4.87 operator==()

```
bool Json::Value::operator== (
            const Value & other ) const
```

9.79.4.88 operator>()

```
bool Json::Value::operator> (
            const Value & other ) const
```

9.79.4.89 operator>=()

```
bool Json::Value::operator>= (
            const Value & other ) const
```

9.79.4.90 operator[]() [1/9]

```
Value & Json::Value::operator[] (
            ArrayIndex index )
```

Access an array element (zero based index). If the array contains less than index element, then null value are inserted in the array so that its size is index+1. (You may need to say 'value[0u]' to get your compiler to distinguish this from the operator[] which takes a string.)

9.79.4.91 operator[]() [2/9]

```
const Value & Json::Value::operator[] (
            ArrayIndex index ) const
```

Access an array element (zero based index). (You may need to say 'value[0u]' to get your compiler to distinguish this from the operator[] which takes a string.)

9.79.4.92 operator[]() [3/9]

```
Value & Json::Value::operator[] (
            const char * key )
```

Access an object value by name, create a null member if it does not exist.

Note

Because of our implementation, keys are limited to 2^30 -1 chars. Exceeding that will cause an exception.

9.79.4.93 operator[]() [4/9]

```
const Value & Json::Value::operator[] (
            const char * key ) const
```

Access an object value by name, returns null if there is no member with that name.

9.79.4.94 operator[]() [5/9]

```
Value & Json::Value::operator[] (
            const StaticString & key )
```

Access an object value by name, create a null member if it does not exist.

If the object has no entry for that name, then the member name used to store the new entry is not duplicated. Example of use:

```
Json::Value object;
static const StaticString code("code");
object[code] = 1234;
```

9.79.4.95 operator[]() [6/9]

```
Value & Json::Value::operator[] (
            const String & key )
```

Access an object value by name, create a null member if it does not exist.

Parameters

key	may contain embedded nulls.

9.79.4.96 operator[]() [7/9]

```
const Value & Json::Value::operator[] (
            const String & key ) const
```

Access an object value by name, returns null if there is no member with that name.

Parameters

key	may contain embedded nulls.

9.79.4.97 operator[]() [8/9]

```
Value & Json::Value::operator[] (
            int index )
```

9.79.4.98 operator[]() [9/9]

```
const Value & Json::Value::operator[] (
            int index ) const
```

9.79.4.99 releasePayload()

```
void Json::Value::releasePayload ( )  [private]
```

9.79.4.100 removeIndex()

```
bool Json::Value::removeIndex (
            ArrayIndex index,
            Value * removed )
```

Remove the indexed array element.

O(n) expensive operations. Update 'removed' iff removed.

Returns

true if removed (no exceptions)

9.79.4.101 removeMember() [1/5]

```
bool Json::Value::removeMember (
            const char * begin,
            const char * end,
            Value * removed )
```

Same as removeMember(String const& key, Value* removed)

9.79.4.102 removeMember() [2/5]

```
void Json::Value::removeMember (
            const char * key )
```

Remove and return the named member.

Do nothing if it did not exist.

Precondition

type() is objectValue or nullValue

Postcondition

type() is unchanged

9.79.4.103 removeMember() [3/5]

```
bool Json::Value::removeMember (
            const char * key,
            Value * removed )
```

Same as removeMember(const char* begin, const char* end, Value* removed), but 'key' is null-terminated.

9.79.4.104 removeMember() [4/5]

```
void Json::Value::removeMember (
            const String & key )
```

Same as removeMember(const char*)

Parameters

key	may contain embedded nulls.

9.79.4.105 removeMember() [5/5]

```
bool Json::Value::removeMember (
```

```
            String const & key,
            Value * removed )
```

Remove the named map member.

Update 'removed' iff removed.

Parameters

key	may contain embedded nulls.

Returns

true iff removed (no exceptions)

9.79.4.106 resize()

```
void Json::Value::resize (
            ArrayIndex newSize )
```

Resize the array to newSize elements. New elements are initialized to null. May only be called on nullValue or arrayValue.

Precondition

type() is arrayValue or nullValue

Postcondition

type() is arrayValue

9.79.4.107 resolveReference() [1/2]

```
Value & Json::Value::resolveReference (
            const char * key )  [private]
```

9.79.4.108 resolveReference() [2/2]

```
Value & Json::Value::resolveReference (
            const char * key,
            const char * end )  [private]
```

9.79.4.109 setComment() [1/3]

```
void Json::Value::setComment (
            const char * comment,
            CommentPlacement placement )  [inline]
```

Deprecated Always pass len.

Definition at line 571 of file value.h.

9.79.4.110 setComment() [2/3]

```
void Json::Value::setComment (
            const char * comment,
            size_t len,
            CommentPlacement placement )  [inline]
```

Comments must be //... or /* ... */.

Definition at line 575 of file value.h.

9.79.4.111 setComment() [3/3]

```
void Json::Value::setComment (
            String comment,
            CommentPlacement placement )
```

Comments must be //... or /* ... */.

9.79.4.112 setIsAllocated()

```
void Json::Value::setIsAllocated (
            bool v )  [inline], [private]
```

Definition at line 622 of file value.h.

9.79.4.113 setOffsetLimit()

```
void Json::Value::setOffsetLimit (
            ptrdiff_t limit )
```

9.79.4.114 setOffsetStart()

```
void Json::Value::setOffsetStart (
            ptrdiff_t start )
```

9.79.4.115 setType()

```
void Json::Value::setType (
            ValueType v )  [inline], [private]
```

Definition at line 616 of file value.h.

9.79.4.116 size()

```
ArrayIndex Json::Value::size ( ) const
```

Number of values in array or object.

9.79.4.117 swap()

```
void Json::Value::swap (
            Value & other )
```

Swap everything.

9.79.4.118 swapPayload()

```
void Json::Value::swapPayload (
            Value & other )
```

Swap values but leave comments and source offsets in place.

9.79.4.119 toStyledString()

```
String Json::Value::toStyledString ( ) const
```

9.79.4.120 type()

```
ValueType Json::Value::type ( ) const
```

9.79.5 Friends And Related Symbol Documentation

9.79.5.1 ValueIteratorBase

```
friend class ValueIteratorBase  [friend]
```

Definition at line 199 of file value.h.

9.79.6 Field Documentation

9.79.6.1 allocated_

```
unsigned int Json::Value::allocated_
```

Definition at line 656 of file value.h.

9.79.6.2 [struct]

```
struct { ...  } Json::Value::bits_  [private]
```

9.79.6.3 comments_

```
Comments Json::Value::comments_  [private]
```

Definition at line 674 of file value.h.

9.79.6.4 defaultRealPrecision

```
constexpr UInt Json::Value::defaultRealPrecision = 17  [static], [constexpr]
```

Default precision for real value for string representation.

Definition at line 251 of file value.h.

9.79.6.5 limit_

```
ptrdiff_t Json::Value::limit_  [private]
```

Definition at line 679 of file value.h.

9.79.6.6 maxInt

```
constexpr Int Json::Value::maxInt = Int(UInt(-1) / 2)  [static], [constexpr]
```

Maximum signed int value that can be stored in a Json::Value.

Definition at line 238 of file value.h.

9.79.6.7 maxInt64

```
constexpr Int64 Json::Value::maxInt64 = Int64(UInt64(-1) / 2)  [static], [constexpr]
```

Maximum signed 64 bits int value that can be stored in a Json::Value.

Definition at line 246 of file value.h.

9.79.6.8 maxLargestInt

```
constexpr LargestInt Json::Value::maxLargestInt = LargestInt(LargestUInt(-1) / 2)  [static],
[constexpr]
```

Maximum signed integer value that can be stored in a Json::Value.

Definition at line 231 of file value.h.

9.79.6.9 maxLargestUInt

```
constexpr LargestUInt Json::Value::maxLargestUInt = LargestUInt(-1)  [static], [constexpr]
```

Maximum unsigned integer value that can be stored in a Json::Value.

Definition at line 233 of file value.h.

9.79.6.10 maxUInt

```
constexpr UInt Json::Value::maxUInt = UInt(-1)  [static], [constexpr]
```

Maximum unsigned int value that can be stored in a Json::Value.

Definition at line 240 of file value.h.

9.79.6.11 maxUInt64

```
constexpr UInt64 Json::Value::maxUInt64 = UInt64(-1)  [static], [constexpr]
```

Maximum unsigned 64 bits int value that can be stored in a Json::Value.

Definition at line 248 of file value.h.

9.79.6.12 maxUInt64AsDouble

```
constexpr double Json::Value::maxUInt64AsDouble = 18446744073709551615.0  [static], [constexpr]
```

Definition at line 255 of file value.h.

9.79.6.13 minInt

```
constexpr Int Json::Value::minInt = Int(~(UInt(-1) / 2))  [static], [constexpr]
```

Minimum signed int value that can be stored in a Json::Value.

Definition at line 236 of file value.h.

9.79.6.14 minInt64

```
constexpr Int64 Json::Value::minInt64 = Int64(~(UInt64(-1) / 2))  [static], [constexpr]
```

Minimum signed 64 bits int value that can be stored in a Json::Value.

Definition at line 244 of file value.h.

9.79.6.15 minLargestInt

```
constexpr LargestInt Json::Value::minLargestInt  [static], [constexpr]
```

Initial value:

```
=
        LargestInt(~(LargestUInt(-1) / 2))
```

Minimum signed integer value that can be stored in a Json::Value.

Definition at line 228 of file value.h.

9.79.6.16 null

```
const Value& Json::Value::null  [static]
```

Definition at line 220 of file value.h.

9.79.6.17 nullRef

```
const Value& Json::Value::nullRef  [static]
```

Definition at line 221 of file value.h.

9.79.6.18 start_

```
ptrdiff_t Json::Value::start_  [private]
```

Definition at line 678 of file value.h.

9.79.6.19 value_

```
union Json::Value::ValueHolder Json::Value::value_  [private]
```

9.79.6.20 value_type_

```
unsigned int Json::Value::value_type_
```

Definition at line 654 of file value.h.

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

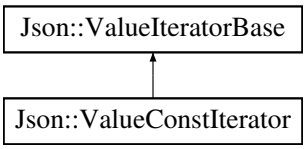
- include/jsoncpp/value.h

9.80 Json::ValueConstIterator Class Reference

const iterator for object and array value.

`#include <value.h>`

Inheritance diagram for Json::ValueConstIterator:



Public Types

- using value_type = const Value
- using reference = const Value &
- using pointer = const Value *
- using SelfType = ValueConstIterator

Public Types inherited from Json::ValueIteratorBase

- using iterator_category = std::bidirectional_iterator_tag
- using size_t = unsigned int
- using difference_type = int
- using SelfType = ValueIteratorBase

Public Member Functions

- ValueConstIterator ()
- ValueConstIterator (ValueIterator const &other)
- SelfType & operator= (const ValueIteratorBase &other)
- SelfType operator++ (int)
- SelfType operator-- (int)
- SelfType & operator-- ()
- SelfType & operator++ ()
- reference operator* () const
- pointer operator-> () const

Public Member Functions inherited from Json::ValueIteratorBase

- bool operator== (const SelfType &other) const
- bool operator!= (const SelfType &other) const
- difference_type operator- (const SelfType &other) const
- Value key () const
- UInt index () const
- String name () const
- char const * memberName () const
- char const * memberName (char const **end) const
- ValueIteratorBase ()
- ValueIteratorBase (const Value::ObjectValues::iterator &current)

Private Member Functions

- ValueConstIterator (const Value::ObjectValues::iterator &current)

Friends

- class Value

Additional Inherited Members

Protected Member Functions inherited from Json::ValueIteratorBase

- const Value & deref () const
- Value & deref ()
- void increment ()
- void decrement ()
- difference_type computeDistance (const SelfType &other) const
- bool isEqual (const SelfType &other) const
- void copy (const SelfType &other)

9.80.1 Detailed Description

const iterator for object and array value.

Definition at line 879 of file value.h.

9.80.2 Member Typedef Documentation

9.80.2.1 pointer

```
using Json::ValueConstIterator::pointer = const Value*
```

Definition at line 887 of file value.h.

9.80.2.2 reference

```
using Json::ValueConstIterator::reference = const Value&
```

Definition at line 886 of file value.h.

9.80.2.3 SelfType

```
using Json::ValueConstIterator::SelfType = ValueConstIterator
```

Definition at line 888 of file value.h.

9.80.2.4 value_type

```
using Json::ValueConstIterator::value_type = const Value
```

Definition at line 883 of file value.h.

9.80.3 Constructor & Destructor Documentation

9.80.3.1 ValueConstIterator() [1/3]

```
Json::ValueConstIterator::ValueConstIterator ( )
```

9.80.3.2 ValueConstIterator() [2/3]

```
Json::ValueConstIterator::ValueConstIterator (
            ValueIterator const & other )
```

9.80.3.3 ValueConstIterator() [3/3]

```
Json::ValueConstIterator::ValueConstIterator (
            const Value::ObjectValues::iterator & current )  [explicit], [private]
```

9.80.4 Member Function Documentation

9.80.4.1 operator*()

```
reference Json::ValueConstIterator::operator* ( ) const  [inline]
```

Definition at line 923 of file value.h.

9.80.4.2 operator++() [1/2]

```
SelfType & Json::ValueConstIterator::operator++ ( )  [inline]
```

Definition at line 918 of file value.h.

9.80.4.3 operator++() [2/2]

```
SelfType Json::ValueConstIterator::operator++ (
            int  )  [inline]
```

Definition at line 901 of file value.h.

9.80.4.4 operator--() [1/2]

```
SelfType & Json::ValueConstIterator::operator-- ( )  [inline]
```

Definition at line 913 of file value.h.

9.80.4.5 operator--() [2/2]

```
SelfType Json::ValueConstIterator::operator-- (
            int  )  [inline]
```

Definition at line 907 of file value.h.

9.80.4.6 operator->()

```
pointer Json::ValueConstIterator::operator-> ( ) const  [inline]
```

Definition at line 927 of file value.h.

9.80.4.7 operator=()

```
SelfType & Json::ValueConstIterator::operator= (
            const ValueIteratorBase & other )
```

9.80.5 Friends And Related Symbol Documentation

9.80.5.1 Value

```
friend class Value  [friend]
```

Definition at line 880 of file value.h.

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

- include/jsoncpp/value.h

9.81 Json::Value::ValueHolder Union Reference

Data Fields

- LargestInt int_
- LargestUInt uint_
- double real_
- bool bool_
- char * string_
- ObjectValues * map_

9.81.1 Detailed Description

Definition at line 643 of file value.h.

9.81.2 Field Documentation

9.81.2.1 bool_

```
bool Json::Value::ValueHolder::bool_
```

Definition at line 647 of file value.h.

9.81.2.2 int_

```
LargestInt Json::Value::ValueHolder::int_
```

Definition at line 644 of file value.h.

9.81.2.3 map_

```
ObjectValues* Json::Value::ValueHolder::map_
```

Definition at line 649 of file value.h.

9.81.2.4 real_

```
double Json::Value::ValueHolder::real_
```

Definition at line 646 of file value.h.

9.81.2.5 string_

```
char* Json::Value::ValueHolder::string_
```

Definition at line 648 of file value.h.

9.81.2.6 uint_

```
LargestUInt Json::Value::ValueHolder::uint_
```

Definition at line 645 of file value.h.

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

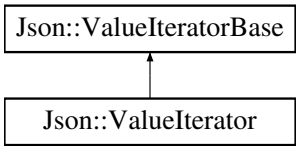
- include/jsoncpp/value.h

9.82 Json::ValueIterator Class Reference

Iterator for object and array value.

`#include <value.h>`

Inheritance diagram for Json::ValueIterator:



Public Types

- using value_type = Value
- using size_t = unsigned int
- using difference_type = int
- using reference = Value &
- using pointer = Value *
- using SelfType = ValueIterator

Public Types inherited from Json::ValueIteratorBase

- using iterator_category = std::bidirectional_iterator_tag
- using size_t = unsigned int
- using difference_type = int
- using SelfType = ValueIteratorBase

Public Member Functions

- ValueIterator ()
- ValueIterator (const ValueConstIterator &other)
- ValueIterator (const ValueIterator &other)
- SelfType & operator= (const SelfType &other)
- SelfType operator++ (int)
- SelfType operator-- (int)
- SelfType & operator-- ()
- SelfType & operator++ ()
- reference operator* () const
- pointer operator-> () const

Public Member Functions inherited from Json::ValueIteratorBase

- bool operator== (const SelfType &other) const
- bool operator!= (const SelfType &other) const
- difference_type operator- (const SelfType &other) const
- Value key () const
- UInt index () const
- String name () const
- char const * memberName () const
- char const * memberName (char const **end) const
- ValueIteratorBase ()
- ValueIteratorBase (const Value::ObjectValues::iterator &current)

Private Member Functions

- ValueIterator (const Value::ObjectValues::iterator &current)

Friends

- class Value

Additional Inherited Members

Protected Member Functions inherited from Json::ValueIteratorBase

- const Value & deref () const
- Value & deref ()
- void increment ()
- void decrement ()
- difference_type computeDistance (const SelfType &other) const
- bool isEqual (const SelfType &other) const
- void copy (const SelfType &other)

9.82.1 Detailed Description

Iterator for object and array value.

Definition at line 934 of file value.h.

9.82.2 Member Typedef Documentation

9.82.2.1 difference_type

```
using Json::ValueIterator::difference_type = int
```

Definition at line 940 of file value.h.

9.82.2.2 pointer

```
using Json::ValueIterator::pointer = Value*
```

Definition at line 942 of file value.h.

9.82.2.3 reference

```
using Json::ValueIterator::reference = Value&
```

Definition at line 941 of file value.h.

9.82.2.4 SelfType

```
using Json::ValueIterator::SelfType = ValueIterator
```

Definition at line 943 of file value.h.

9.82.2.5 size_t

```
using Json::ValueIterator::size_t = unsigned int
```

Definition at line 939 of file value.h.

9.82.2.6 value_type

```
using Json::ValueIterator::value_type = Value
```

Definition at line 938 of file value.h.

9.82.3 Constructor & Destructor Documentation

9.82.3.1 ValueIterator() [1/4]

```
Json::ValueIterator::ValueIterator ( )
```

9.82.3.2 ValueIterator() [2/4]

```
Json::ValueIterator::ValueIterator (
            const ValueConstIterator & other )  [explicit]
```

9.82.3.3 ValueIterator() [3/4]

```
Json::ValueIterator::ValueIterator (
            const ValueIterator & other )
```

9.82.3.4 ValueIterator() [4/4]

```
Json::ValueIterator::ValueIterator (
            const Value::ObjectValues::iterator & current )  [explicit], [private]
```

9.82.4 Member Function Documentation

9.82.4.1 operator*()

```
reference Json::ValueIterator::operator* ( ) const  [inline]
```

The return value of non-const iterators can be changed, so the these functions are not const because the returned references/pointers can be used to change state of the base class.

Definition at line 984 of file value.h.

9.82.4.2 operator++() [1/2]

```
SelfType & Json::ValueIterator::operator++ ( )  [inline]
```

Definition at line 974 of file value.h.

9.82.4.3 operator++() [2/2]

```
SelfType Json::ValueIterator::operator++ (
            int  )  [inline]
```

Definition at line 957 of file value.h.

9.82.4.4 operator--() [1/2]

```
SelfType & Json::ValueIterator::operator-- ( )  [inline]
```

Definition at line 969 of file value.h.

9.82.4.5 operator--() [2/2]

```
SelfType Json::ValueIterator::operator-- (
            int  )  [inline]
```

Definition at line 963 of file value.h.

9.82.4.6 operator->()

```
pointer Json::ValueIterator::operator-> ( ) const  [inline]
```

Definition at line 987 of file value.h.

9.82.4.7 operator=()

```
SelfType & Json::ValueIterator::operator= (
            const SelfType & other )
```

9.82.5 Friends And Related Symbol Documentation

9.82.5.1 Value

```
friend class Value  [friend]
```

Definition at line 935 of file value.h.

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

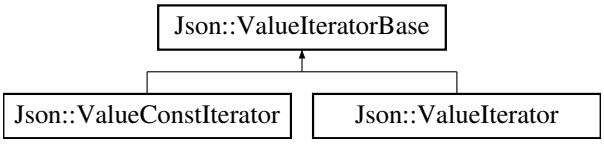
- include/jsoncpp/value.h

9.83 Json::ValueIteratorBase Class Reference

base class for Value iterators.

`#include <value.h>`

Inheritance diagram for Json::ValueIteratorBase:



Public Types

- using iterator_category = std::bidirectional_iterator_tag
- using size_t = unsigned int
- using difference_type = int
- using SelfType = ValueIteratorBase

Public Member Functions

- bool operator== (const SelfType &other) const
- bool operator!= (const SelfType &other) const
- difference_type operator- (const SelfType &other) const
- Value key () const
- UInt index () const
- String name () const
- char const * memberName () const
- char const * memberName (char const **end) const
- ValueIteratorBase ()
- ValueIteratorBase (const Value::ObjectValues::iterator &current)

Protected Member Functions

- const Value & deref () const
- Value & deref ()
- void increment ()
- void decrement ()
- difference_type computeDistance (const SelfType &other) const
- bool isEqual (const SelfType &other) const
- void copy (const SelfType &other)

Private Attributes

- Value::ObjectValues::iterator current_
- bool isNull_ {true}

9.83.1 Detailed Description

base class for Value iterators.

Definition at line 801 of file value.h.

9.83.2 Member Typedef Documentation

9.83.2.1 difference_type

```
using Json::ValueIteratorBase::difference_type = int
```

Definition at line 805 of file value.h.

9.83.2.2 iterator_category

```
using Json::ValueIteratorBase::iterator_category = std::bidirectional_iterator_tag
```

Definition at line 803 of file value.h.

9.83.2.3 SelfType

```
using Json::ValueIteratorBase::SelfType = ValueIteratorBase
```

Definition at line 806 of file value.h.

9.83.2.4 size_t

```
using Json::ValueIteratorBase::size_t = unsigned int
```

Definition at line 804 of file value.h.

9.83.3 Constructor & Destructor Documentation

9.83.3.1 ValueIteratorBase() [1/2]

```
Json::ValueIteratorBase::ValueIteratorBase ( )
```

9.83.3.2 ValueIteratorBase() [2/2]

```
Json::ValueIteratorBase::ValueIteratorBase (
            const Value::ObjectValues::iterator & current )  [explicit]
```

9.83.4 Member Function Documentation

9.83.4.1 computeDistance()

```
difference_type Json::ValueIteratorBase::computeDistance (
            const SelfType & other ) const  [protected]
```

9.83.4.2 copy()

```
void Json::ValueIteratorBase::copy (
            const SelfType & other )  [protected]
```

9.83.4.3 decrement()

```
void Json::ValueIteratorBase::decrement ( )  [protected]
```

9.83.4.4 deref() [1/2]

```
Value & Json::ValueIteratorBase::deref ( )  [protected]
```

9.83.4.5 deref() [2/2]

```
const Value & Json::ValueIteratorBase::deref ( ) const  [protected]
```

Internal utility functions to assist with implementing other iterator functions. The const and non-const versions of the "deref" protected methods expose the protected current_ member variable in a way that can often be optimized away by the compiler.

9.83.4.6 increment()

```
void Json::ValueIteratorBase::increment ( )  [protected]
```

9.83.4.7 index()

```
UInt Json::ValueIteratorBase::index ( ) const
```

Return the index of the referenced Value, or -1 if it is not an arrayValue.

9.83.4.8 isEqual()

```
bool Json::ValueIteratorBase::isEqual (
            const SelfType & other ) const  [protected]
```

9.83.4.9 key()

```
Value Json::ValueIteratorBase::key ( ) const
```

Return either the index or the member name of the referenced value as a Value.

9.83.4.10 memberName() [1/2]

```
char const * Json::ValueIteratorBase::memberName ( ) const
```

Return the member name of the referenced Value. "" if it is not an objectValue.

Deprecated This cannot be used for UTF-8 strings, since there can be embedded nulls.

9.83.4.11 memberName() [2/2]

```
char const * Json::ValueIteratorBase::memberName (
            char const ** end ) const
```

Return the member name of the referenced Value, or NULL if it is not an objectValue.

Note

Better version than memberName(). Allows embedded nulls.

9.83.4.12 name()

```
String Json::ValueIteratorBase::name ( ) const
```

Return the member name of the referenced Value, or "" if it is not an objectValue.

Note

Avoid `c_str()` on result, as embedded zeroes are possible.

9.83.4.13 operator"!=()

```
bool Json::ValueIteratorBase::operator!= (
            const SelfType & other ) const  [inline]
```

Definition at line 812 of file value.h.

9.83.4.14 operator-()

```
difference_type Json::ValueIteratorBase::operator- (
            const SelfType & other ) const  [inline]
```

Definition at line 816 of file value.h.

References computeDistance().

9.83.4.15 operator==()

```
bool Json::ValueIteratorBase::operator== (
            const SelfType & other ) const  [inline]
```

Definition at line 808 of file value.h.

9.83.5 Field Documentation

9.83.5.1 current_

```
Value::ObjectValues::iterator Json::ValueIteratorBase::current_  [private]
```

Definition at line 865 of file value.h.

9.83.5.2 isNull_

```
bool Json::ValueIteratorBase::isNull_ {true}  [private]
```

Definition at line 867 of file value.h.

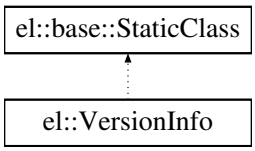
The documentation for this class was generated from the following file:

- include/jsoncpp/value.h

9.84 el::VersionInfo Class Reference

```
#include <easylogging++.h>
```

Inheritance diagram for el::VersionInfo:



Static Public Member Functions

- static const std::string version (void)
  Current version number.
- static const std::string releaseDate (void)
  Release date of current version.

9.84.1 Detailed Description

Definition at line 3894 of file easylogging++.h.

9.84.2 Member Function Documentation

9.84.2.1 releaseDate()

```
const std::string el::VersionInfo::releaseDate (
            void  )  [static]
```

Release date of current version.

Definition at line 3112 of file easylogging++.cc.

9.84.2.2 version()

```
const std::string el::VersionInfo::version (
            void  )  [static]
```

Current version number.

Definition at line 3108 of file easylogging++.cc.

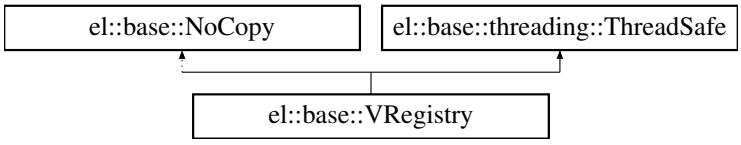
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.85 el::base::VRegistry Class Reference

Represents registries for verbose logging.

Inheritance diagram for el::base::VRegistry:



Public Member Functions

- VRegistry (base::type::VerboseLevel level, base::type::EnumType *pFlags)
- void setLevel (base::type::VerboseLevel level)

  Sets verbose level. Accepted range is 0-9.
- base::type::VerboseLevel level (void) const
- void clearModules (void)
- void setModules (const char *modules)
- bool allowed (base::type::VerboseLevel vlevel, const char *file)
- const std::unordered_map< std::string, base::type::VerboseLevel > & modules (void) const
- void setFromArgs (const base::utils::CommandLineArgs *commandLineArgs)
- bool vModulesEnabled (void)

  Whether or not vModules enabled.

Public Member Functions inherited from el::base::threading::ThreadSafe

- virtual void acquireLock (void) ELPP_FINAL
- virtual void releaseLock (void) ELPP_FINAL
- virtual base::threading::Mutex & lock (void) ELPP_FINAL

Private Attributes

- base::type::VerboseLevel m_level
- base::type::EnumType * m_pFlags
- std::unordered_map< std::string, base::type::VerboseLevel > m_modules

Additional Inherited Members

Protected Member Functions inherited from el::base::threading::ThreadSafe

- ThreadSafe (void)
- virtual ~ThreadSafe (void)

Private Member Functions inherited from el::base::NoCopy

- NoCopy (void)

9.85.1 Detailed Description

Represents registries for verbose logging.

Definition at line 2417 of file easylogging++.h.

9.85.2 Constructor & Destructor Documentation

9.85.2.1 VRegistry()

```
el::base::VRegistry::VRegistry (
            base::type::VerboseLevel level,
            base::type::EnumType * pFlags )  [explicit]
```

Definition at line 1935 of file easylogging++.cc.

9.85.3 Member Function Documentation

9.85.3.1 allowed()

```
bool el::base::VRegistry::allowed (
            base::type::VerboseLevel vlevel,
            const char * file )
```

Definition at line 2019 of file easylogging++.cc.

References el::AllowVerboseIfModuleNotSpecified, el::base::utils::File::buildBaseFilename(), el::base::utils::hasFlag(), el::base::consts::kSourceFilenameMaxLength, el::base::threading::ThreadSafe::lock(), m_level, m_modules, m_pFlags, and el::base::utils::Str::wildCardMatch().

9.85.3.2 clearModules()

```
void el::base::VRegistry::clearModules (
            void  )  [inline]
```

Definition at line 2428 of file easylogging++.h.

9.85.3.3 level()

```
base::type::VerboseLevel el::base::VRegistry::level (
            void  ) const  [inline]
```

Definition at line 2424 of file easylogging++.h.

9.85.3.4 modules()

```
const std::unordered_map< std::string, base::type::VerboseLevel > & el::base::VRegistry↩
::modules (
            void  ) const  [inline]
```

Definition at line 2437 of file easylogging++.h.

9.85.3.5 setFromArgs()

```
void el::base::VRegistry::setFromArgs (
            const base::utils::CommandLineArgs * commandLineArgs )
```

Definition at line 2039 of file easylogging++.cc.

References el::base::utils::CommandLineArgs::getParamValue(), el::base::utils::CommandLineArgs::hasParam(), el::base::utils::CommandLineArgs::hasParamWithValue(), el::base::consts::kMaxVerboseLevel, setLevel(), setModules(), and vModulesEnabled().

9.85.3.6 setLevel()

```
void el::base::VRegistry::setLevel (
            base::type::VerboseLevel level )
```

Sets verbose level. Accepted range is 0-9.

Definition at line 1939 of file easylogging++.cc.

References el::base::consts::kMaxVerboseLevel, level(), el::base::threading::ThreadSafe::lock(), and m_level.

9.85.3.7 setModules()

```
void el::base::VRegistry::setModules (
            const char * modules )
```

Definition at line 1947 of file easylogging++.cc.

References el::DisableVModulesExtensions, el::base::utils::Str::endsWith(), el::base::utils::hasFlag(), level(), el::base::threading::ThreadSafe::lock(), m_modules, m_pFlags, and modules().

9.85.3.8 vModulesEnabled()

```
bool el::base::VRegistry::vModulesEnabled (
            void  )  [inline]
```

Whether or not vModules enabled.

Definition at line 2444 of file easylogging++.h.

9.85.4 Field Documentation

9.85.4.1 m_level

```
base::type::VerboseLevel el::base::VRegistry::m_level  [private]
```

Definition at line 2449 of file easylogging++.h.

9.85.4.2 m_modules

```
std::unordered_map<std::string, base::type::VerboseLevel> el::base::VRegistry::m_modules
[private]
```

Definition at line 2451 of file easylogging++.h.

9.85.4.3 m_pFlags

```
base::type::EnumType* el::base::VRegistry::m_pFlags  [private]
```

Definition at line 2450 of file easylogging++.h.

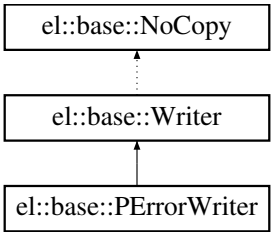
The documentation for this class was generated from the following files:

- include/easylogging++.h
- lib/easylogging++.cc

9.86 el::base::Writer Class Reference

Main entry point of each logging.

Inheritance diagram for el::base::Writer:



Public Member Functions

- Writer (Level level, const char *file, base::type::LineNumber line, const char *func, base::DispatchAction dispatchAction=base::DispatchAction::NormalLog, base::type::VerboseLevel verboseLevel=0)
- Writer (LogMessage *msg, base::DispatchAction dispatchAction=base::DispatchAction::NormalLog)
- virtual ~Writer (void)
- template<typename T >
  Writer & operator<< (const T &log)
- Writer & operator<< (std::ostream &(*log)(std::ostream &))
- operator bool ()
- Writer & construct (Logger *logger, bool needLock=true)
- Writer & construct (int count, const char *loggerIds,...)

Protected Member Functions

- void initializeLogger (const std::string &loggerId, bool lookup=true, bool needLock=true)
- void processDispatch ()
- void triggerDispatch (void)

Protected Attributes

- LogMessage * m_msg
- Level m_level
- const char * m_file
- const base::type::LineNumber m_line
- const char * m_func
- base::type::VerboseLevel m_verboseLevel
- Logger * m_logger
- bool m_proceed
- base::MessageBuilder m_messageBuilder
- base::DispatchAction m_dispatchAction
- std::vector< std::string > m_loggerIds

Friends

- class el::Helpers

Additional Inherited Members

Private Member Functions inherited from el::base::NoCopy

- NoCopy (void)

9.86.1 Detailed Description

Main entry point of each logging.

Definition at line 3190 of file easylogging++.h.

9.86.2 Constructor & Destructor Documentation

9.86.2.1 Writer() [1/2]

```
el::base::Writer::Writer (
            Level level,
            const char * file,
            base::type::LineNumber line,
            const char * func,
            base::DispatchAction dispatchAction = base::DispatchAction::NormalLog,
            base::type::VerboseLevel verboseLevel = 0 )  [inline]
```

Definition at line 3192 of file easylogging++.h.

9.86.2.2 Writer() [2/2]

```
el::base::Writer::Writer (
            LogMessage * msg,
            base::DispatchAction dispatchAction = base::DispatchAction::NormalLog )  [inline]
```

Definition at line 3199 of file easylogging++.h.

References el::Unknown.

9.86.2.3 ~Writer()

```
virtual el::base::Writer::~Writer (
            void  )  [inline], [virtual]
```

Definition at line 3204 of file easylogging++.h.

9.86.3 Member Function Documentation

9.86.3.1 construct() [1/2]

```
Writer & el::base::Writer::construct (
            int count,
            const char * loggerIds,
             ...  )
```

Definition at line 2538 of file easylogging++.cc.

References ELPP, el::base::MessageBuilder::initialize(), initializeLogger(), m_logger, m_loggerIds, m_messageBuilder, and el::MultiLoggerSupport.

9.86.3.2 construct() [2/2]

```
Writer & el::base::Writer::construct (
            Logger * logger,
            bool needLock = true )
```

Definition at line 2531 of file easylogging++.cc.

References el::Logger::id(), el::base::MessageBuilder::initialize(), initializeLogger(), m_logger, and m_messageBuilder.

9.86.3.3 initializeLogger()

```
void el::base::Writer::initializeLogger (
            const std::string & loggerId,
            bool lookup = true,
            bool needLock = true )  [protected]
```

Definition at line 2557 of file easylogging++.cc.

References el::base::threading::ThreadSafe::acquireLock(), el::LevelHelper::castToInt(), construct(), el::CreateLoggerAutomatically, el::Debug, ELPP, el::Logger::enabled(), el::HierarchicalLogging, el::base::consts::kDefaultLoggerId, m_file, m_func, m_level, m_line, m_logger, m_proceed, and el::Verbose.

9.86.3.4 operator bool()

```
el::base::Writer::operator bool ( )  [inline]
```

Definition at line 3227 of file easylogging++.h.

9.86.3.5 operator<<() [1/2]

```
template<typename T >
Writer & el::base::Writer::operator<< (
            const T & log )  [inline]
```

Definition at line 3209 of file easylogging++.h.

9.86.3.6 operator<<() [2/2]

```
Writer & el::base::Writer::operator<< (
            std::ostream &(*)(std::ostream &) log )  [inline]
```

Definition at line 3218 of file easylogging++.h.

9.86.3.7 processDispatch()

```
void el::base::Writer::processDispatch ( )  [protected]
```

Definition at line 2585 of file easylogging++.cc.

References ELPP, ELPP_LITERAL, initializeLogger(), m_logger, m_loggerIds, m_proceed, el::MultiLoggerSupport, el::base::threading::ThreadSafe::releaseLock(), el::Logger::stream(), and triggerDispatch().

9.86.3.8 triggerDispatch()

```
void el::base::Writer::triggerDispatch (
            void  )  [protected]
```

Definition at line 2626 of file easylogging++.cc.

References el::base::utils::abort(), construct(), el::DisableApplicationAbortOnFatalLog, el::base::LogDispatcher::dispatch(), ELPP, ELPP_LITERAL, el::Fatal, el::base::consts::kDefaultLoggerId, m_dispatchAction, m_file, m_func, m_level, m_line, m_logger, m_msg, m_proceed, m_verboseLevel, el::base::threading::ThreadSafe::releaseLock(), el::Logger::stream(), and el::Warning.

9.86.4 Friends And Related Symbol Documentation

9.86.4.1 el::Helpers

```
friend class el::Helpers  [friend]
```

Definition at line 3245 of file easylogging++.h.

9.86.5 Field Documentation

9.86.5.1 m_dispatchAction

```
base::DispatchAction el::base::Writer::m_dispatchAction  [protected]
```

Definition at line 3243 of file easylogging++.h.

9.86.5.2 m_file

```
const char* el::base::Writer::m_file  [protected]
```

Definition at line 3236 of file easylogging++.h.

9.86.5.3 m_func

```
const char* el::base::Writer::m_func  [protected]
```

Definition at line 3238 of file easylogging++.h.

9.86.5.4 m_level

```
Level el::base::Writer::m_level  [protected]
```

Definition at line 3235 of file easylogging++.h.

9.86.5.5 m_line

```
const base::type::LineNumber el::base::Writer::m_line  [protected]
```

Definition at line 3237 of file easylogging++.h.

9.86.5.6 m_logger

```
Logger* el::base::Writer::m_logger  [protected]
```

Definition at line 3240 of file easylogging++.h.

9.86.5.7 m_loggerIds

```
std::vector<std::string> el::base::Writer::m_loggerIds  [protected]
```

Definition at line 3244 of file easylogging++.h.

9.86.5.8 m_messageBuilder

```
base::MessageBuilder el::base::Writer::m_messageBuilder  [protected]
```

Definition at line 3242 of file easylogging++.h.

9.86.5.9 m_msg

```
LogMessage* el::base::Writer::m_msg  [protected]
```

Definition at line 3234 of file easylogging++.h.

9.86.5.10 m_proceed

```
bool el::base::Writer::m_proceed  [protected]
```

Definition at line 3241 of file easylogging++.h.

9.86.5.11 m_verboseLevel

```
base::type::VerboseLevel el::base::Writer::m_verboseLevel  [protected]
```

Definition at line 3239 of file easylogging++.h.

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

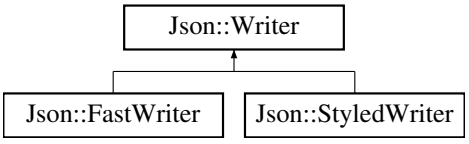
- include/easylogging++.h
- lib/easylogging++.cc

9.87 Json::Writer Class Reference

Abstract class for writers.

```
#include <writer.h>
```

Inheritance diagram for Json::Writer:



Public Member Functions

- virtual ~Writer ()
- virtual String write (const Value &root)=0

9.87.1 Detailed Description

Abstract class for writers.

Deprecated Use StreamWriter. (And really, this is an implementation detail.)

Definition at line 151 of file writer.h.

9.87.2 Constructor & Destructor Documentation

9.87.2.1 ~Writer()

```
virtual Json::Writer::~Writer ( )  [virtual]
```

9.87.3 Member Function Documentation

9.87.3.1 write()

```
virtual String Json::Writer::write (
            const Value & root )  [pure virtual]
```

Implemented in Json::FastWriter, and Json::StyledWriter.

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

- include/jsoncpp/writer.h

Chapter 10

File Documentation

10.1 include/easylogging++.h File Reference

```
#include <ctime>
#include <cstring>
#include <cstdlib>
#include <cctype>
#include <cwchar>
#include <csignal>
#include <cerrno>
#include <cstdarg>
#include <string>
#include <vector>
#include <map>
#include <unordered_map>
#include <utility>
#include <functional>
#include <algorithm>
#include <fstream>
#include <iostream>
#include <sstream>
#include <memory>
#include <type_traits>
```

Data Structures

- class el::base::NoCopy

  Internal helper class that prevent copy constructor for class.
- class el::base::StaticClass

  Internal helper class that makes all default constructors private.
- struct std::hash< el::Level >
- class el::LevelHelper

  Static class that contains helper functions for el::Level.
- class el::ConfigurationTypeHelper

  Static class that contains helper functions for el::ConfigurationType.
- class el::base::SubsecondPrecision

  A subsecond precision class containing actual width and offset of the subsecond part.

- class el::base::threading::internal::NoMutex

  Mutex wrapper used when multi-threading is disabled.
- class el::base::threading::internal::NoScopedLock< Mutex >

  Lock guard wrapper used when multi-threading is disabled.
- class el::base::threading::ThreadSafe

  Base of thread safe class, this class is inheritable-only.
- class el::base::utils::File
- class el::base::utils::Str

  String utilities helper class used internally. You should not use it.
- class el::base::utils::OS

  Operating System helper static class used internally. You should not use it.
- class el::base::utils::DateTime

  Contains utilities for cross-platform date/time. This class make use of el::base::utils::Str.
- class el::base::utils::CommandLineArgs

  Command line arguments for application if specified using el::Helpers::setArgs(..) or START_EASYLOGGINGPP(..)
- class el::base::utils::AbstractRegistry< T_Ptr, Container >

  Abstract registry (aka repository) that provides basic interface for pointer repository specified by T_Ptr type.
- class el::base::utils::Registry< T_Ptr, T_Key >

  A pointer registry mechanism to manage memory and provide search functionalities. (non-predicate version)
- class el::base::utils::RegistryWithPred< T_Ptr, Pred >

  A pointer registry mechanism to manage memory and provide search functionalities. (predicate version)
- class el::base::utils::Utils
- class el::Loggable

  Base of Easylogging++ friendly class.
- class el::base::LogFormat

  Represents log format containing flags and date format. This is used internally to start initial log.
- class el::CustomFormatSpecifier

  User-provided custom format specifier.
- class el::Configuration

  Represents single configuration that has representing level, configuration type and a string based value.
- class el::Configuration::Predicate

  Used to find configuration from configuration (pointers) repository. Avoid using it.
- class el::Configurations

  Thread-safe Configuration repository.
- class el::Configurations::Parser

  Parser used internally to parse configurations from file or text.
- class el::base::TypedConfigurations

  Configurations with data types.
- class el::base::HitCounter

  Class that keeps record of current line hit for occasional logging.
- class el::base::HitCounter::Predicate
- class el::base::RegisteredHitCounters

  Repository for hit counters used across the application.
- class el::Callback< T >
- class el::LogDispatchData
- class el::LogDispatchCallback
- class el::PerformanceTrackingCallback
- class el::LoggerRegistrationCallback
- class el::LogBuilder
- class el::Logger

  Represents a logger holding ID and configurations we need to write logs.

- class el::base::RegisteredLoggers

  Loggers repository.
- class el::base::VRegistry

  Represents registries for verbose logging.
- class el::LogMessage
- class el::base::Storage

  Easylogging++ management storage.
- class el::base::DefaultLogDispatchCallback
- class el::base::DefaultLogBuilder
- class el::base::LogDispatcher

  Dispatches log messages.
- class el::base::MessageBuilder
- class el::base::NullWriter

  Writes nothing - Used when certain log is disabled.
- class el::base::Writer

  Main entry point of each logging.
- class el::base::PErrorWriter
- class el::base::debug::CrashHandler
- class el::SysLogInitializer

  Initializes syslog with process ID, options and facility. calls closelog() on d'tor.
- class el::Helpers

  Static helpers for developers.
- class el::Loggers

  Static helpers to deal with loggers and their configurations.
- class el::Loggers::ScopedAddFlag

  Adds flag and removes it when scope goes out.
- class el::Loggers::ScopedRemoveFlag

  Removes flag and add it when scope goes out.
- class el::VersionInfo

Namespaces

- namespace el

  Easylogging++ entry namespace.
- namespace el::base

  Namespace containing base/internal functionality used by Easylogging++.
- namespace el::base::type

  Data types used by Easylogging++.
- namespace std
- namespace el::base::consts

  Namespace containing constants used internally.
- namespace el::base::utils

  Namespace containing utility functions/static classes used internally.
- namespace el::base::utils::bitwise

  Bitwise operations for C++11 strong enum class. This casts e into Flag_T and returns value after bitwise operation Use these function as.
- namespace el::base::threading
- namespace el::base::threading::internal
- namespace el::base::debug

  Contains some internal debugging tools like crash handler and stack tracer.

Macros

- #define ELPP_COMPILER_GCC 0
- #define ELPP_COMPILER_MSVC 0
- #define ELPP_CRT_DBG_WARNINGS ELPP_COMPILER_MSVC
- #define ELPP_COMPILER_CLANG 0
- #define ELPP_MINGW 0
- #define ELPP_CYGWIN 0
- #define ELPP_COMPILER_INTEL 0
- #define ELPP_OS_WINDOWS 0
- #define ELPP_OS_LINUX 0
- #define ELPP_OS_MAC 0
- #define ELPP_OS_FREEBSD 0
- #define ELPP_OS_SOLARIS 0
- #define ELPP_OS_AIX 0
- #define ELPP_OS_NETBSD 0
- #define ELPP_OS_EMSCRIPTEN 0
- #define ELPP_OS_QNX 0
- #define ELPP_OS_UNIX 0
- #define ELPP_OS_ANDROID 0
- #define ELPP_INTERNAL_DEBUGGING_OUT_INFO std::cout
- #define ELPP_INTERNAL_DEBUGGING_OUT_ERROR std::cerr
- #define ELPP_INTERNAL_DEBUGGING_ENDL std::endl
- #define ELPP_INTERNAL_DEBUGGING_MSG(msg) msg
- #define ELPP_ASSERT(expr, msg)
- #define ELPP_INTERNAL_DEBUGGING_WRITE_PERROR ELPP_INTERNAL_DEBUGGING_OUT_ERROR << ": " << strerror(errno) << " [" << errno << "]"; (void)0
- #define ELPP_INTERNAL_ERROR(msg, pe)
- #define ELPP_INTERNAL_INFO(lvl, msg)
- #define ELPP_STACKTRACE 0
- #define ELPP_UNUSED(x) (void)x
- #define ELPP_EXPORT
- #define STRTOK(a, b, c) strtok(a, b)
- #define STRERROR(a, b, c) strerror(c)
- #define STRCAT(a, b, len) strcat(a, b)
- #define STRCPY(a, b, len) strcpy(a, b)
- #define ELPP_USE_STD_THREADING 0
- #define ELPP_FINAL
- #define ELPP_ASYNC_LOGGING 0
- #define ELPP_THREADING_ENABLED 0
- #define ELPP_FUNC ""
- #define ELPP_VARIADIC_TEMPLATES_SUPPORTED (ELPP_COMPILER_GCC || ELPP_COMPILER_CLANG || ELPP_COMPILER_INTEL || (ELPP_COMPILER_MSVC && _MSC_VER >= 1800))
- #define ELPP_LOGGING_ENABLED 1
- #define ELPP_DEBUG_LOG 1
- #define ELPP_INFO_LOG 1
- #define ELPP_WARNING_LOG 1
- #define ELPP_ERROR_LOG 1
- #define ELPP_FATAL_LOG 1
- #define ELPP_TRACE_LOG 1
- #define ELPP_VERBOSE_LOG 1
- #define elpptime_r localtime_r
- #define elpptime_s localtime_s
- #define elpptime localtime
- #define ELPP_LITERAL(txt) txt

- #define ELPP_STRLEN strlen
- #define ELPP_COUT std::cout
- #define ELPP_COUT_LINE(logLine) logLine << std::flush
- #define ELPP el::base::elStorage
- #define ELPP_SIMPLE_LOG(LOG_TYPE)
- #define ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(temp)
- #define ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(temp)
- #define ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG(temp)
- #define ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(temp)
- #define ELPP_ITERATOR_CONTAINER_LOG_FIVE_ARG(temp)
- #define MAKE_CONTAINERELPP_FRIENDLY(ContainerType, SizeMethod, ElementInstance)

  Macro used internally that can be used externally to make containers easylogging++ friendly.
- #define ELPP_WX_PTR_ENABLED(ContainerType)
- #define ELPP_WX_ENABLED(ContainerType)
- #define ELPP_WX_HASH_MAP_ENABLED(ContainerType)
- #define el_getVALength(...) el_resolveVALength(0, ## __VA_ARGS__, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0)
- #define el_resolveVALength(_0, _1, _2, _3, _4, _5, _6, _7, _8, _9, _10, N, ...) N
- #define ELPP_WRITE_LOG(writer, level, dispatchAction, ...) writer(level, __FILE__, __LINE__↩ , ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__), __VA_ARGS__)
- #define ELPP_WRITE_LOG_IF(writer, condition, level, dispatchAction, ...)
- #define ELPP_WRITE_LOG_EVERY_N(writer, occasion, level, dispatchAction, ...)
- #define ELPP_WRITE_LOG_AFTER_N(writer, n, level, dispatchAction, ...)
- #define ELPP_WRITE_LOG_N_TIMES(writer, n, level, dispatchAction, ...)
- #define MAKE_LOGGABLE(ClassType, ClassInstance, OutputStreamInstance) el::base::type::ostream_t& operator<<(el::base::type::ostream_t& OutputStreamInstance, const ClassType& ClassInstance)
- #define ELPP_INITIALIZE_SYSLOG(id, opt, fac) el::SysLogInitializer elSyslogInit(id, opt, fac)
- #define VLOG_IS_ON(verboseLevel) (ELPP->vRegistry()->allowed(verboseLevel, __FILE__))

  Determines whether verbose logging is on for specified level current file.
- #define ELPP_MIN_UNIT el::base::TimestampUnit::Millisecond
- #define TIMED_SCOPE_IF(obj, blockname, condition)

  Performance tracked scope. Performance gets written when goes out of scope using 'performance' logger.
- #define TIMED_SCOPE(obj, blockname) TIMED_SCOPE_IF(obj, blockname, true)
- #define TIMED_BLOCK(obj, blockName)
- #define TIMED_FUNC_IF(obj, condition) TIMED_SCOPE_IF(obj, ELPP_FUNC, condition)

  Performance tracked function. Performance gets written when goes out of scope using 'performance' logger.
- #define TIMED_FUNC(obj) TIMED_SCOPE(obj, ELPP_FUNC)
- #define PERFORMANCE_CHECKPOINT(obj) obj->checkpoint(std::string(), __FILE__, __LINE__↩ , ELPP_FUNC)
- #define PERFORMANCE_CHECKPOINT_WITH_ID(obj, id) obj->checkpoint(id, __FILE__, __LINE__↩ , ELPP_FUNC)
- #define ELPP_COUNTER (ELPP->hitCounters()->getCounter(__FILE__, __LINE__))

  Gets hit counter for file/line.
- #define ELPP_COUNTER_POS (ELPP_COUNTER == nullptr ? -1 : ELPP_COUNTER->hitCounts())

  Gets hit counter position for file/line, -1 if not registered yet.
- #define CINFO(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Info, dispatchAction, __VA↩ _ARGS__)
- #define CWARNING(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Warning, dispatch↩ Action, __VA_ARGS__)
- #define CDEBUG(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Debug, dispatchAction, ↩ __VA_ARGS__)
- #define CERROR(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Error, dispatchAction, _↩ _VA_ARGS__)
- #define CFATAL(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Fatal, dispatchAction, __↩ VA_ARGS__)

- #define CTRACE(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Trace, dispatchAction, _↩ _VA_ARGS__)
- #define CVERBOSE(writer, vlevel, dispatchAction, ...)
- #define CINFO_IF(writer, condition_, dispatchAction, ...) ELPP_WRITE_LOG_IF(writer, (condition_↩), el::Level::Info, dispatchAction, __VA_ARGS__)
- #define CWARNING_IF(writer, condition_, dispatchAction, ...) ELPP_WRITE_LOG_IF(writer, (condition_↩), el::Level::Warning, dispatchAction, __VA_ARGS__)
- #define CDEBUG_IF(writer, condition_, dispatchAction, ...) ELPP_WRITE_LOG_IF(writer, (condition_↩), el::Level::Debug, dispatchAction, __VA_ARGS__)
- #define CERROR_IF(writer, condition_, dispatchAction, ...) ELPP_WRITE_LOG_IF(writer, (condition_↩), el::Level::Error, dispatchAction, __VA_ARGS__)
- #define CFATAL_IF(writer, condition_, dispatchAction, ...) ELPP_WRITE_LOG_IF(writer, (condition_↩), el::Level::Fatal, dispatchAction, __VA_ARGS__)
- #define CTRACE_IF(writer, condition_, dispatchAction, ...) ELPP_WRITE_LOG_IF(writer, (condition_↩), el::Level::Trace, dispatchAction, __VA_ARGS__)
- #define CVERBOSE_IF(writer, condition_, vlevel, dispatchAction, ...)
- #define CINFO_EVERY_N(writer, occasion, dispatchAction, ...) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Info, dispatchAction, __VA_ARGS__)
- #define CWARNING_EVERY_N(writer, occasion, dispatchAction, ...) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Warning, dispatchAction, __VA_ARGS__)
- #define CDEBUG_EVERY_N(writer, occasion, dispatchAction, ...) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Debug, dispatchAction, __VA_ARGS__)
- #define CERROR_EVERY_N(writer, occasion, dispatchAction, ...) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Error, dispatchAction, __VA_ARGS__)
- #define CFATAL_EVERY_N(writer, occasion, dispatchAction, ...) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Fatal, dispatchAction, __VA_ARGS__)
- #define CTRACE_EVERY_N(writer, occasion, dispatchAction, ...) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Trace, dispatchAction, __VA_ARGS__)
- #define CVERBOSE_EVERY_N(writer, occasion, vlevel, dispatchAction, ...) CVERBOSE_IF(writer, ELPP->validateEveryNCounter(__FILE__, __LINE__, occasion), vlevel, dispatchAction, __VA_ARGS__)
- #define CINFO_AFTER_N(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Info, dispatchAction, __VA_ARGS__)
- #define CWARNING_AFTER_N(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Warning, dispatchAction, __VA_ARGS__)
- #define CDEBUG_AFTER_N(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Debug, dispatchAction, __VA_ARGS__)
- #define CERROR_AFTER_N(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Error, dispatchAction, __VA_ARGS__)
- #define CFATAL_AFTER_N(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Fatal, dispatchAction, __VA_ARGS__)
- #define CTRACE_AFTER_N(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Trace, dispatchAction, __VA_ARGS__)
- #define CVERBOSE_AFTER_N(writer, n, vlevel, dispatchAction, ...) CVERBOSE_IF(writer, ELPP->validateAfterNCounter(__FILE__, __LINE__, n), vlevel, dispatchAction, __VA_ARGS__)
- #define CINFO_N_TIMES(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Info, dispatchAction, __VA_ARGS__)
- #define CWARNING_N_TIMES(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Warning, dispatchAction, __VA_ARGS__)
- #define CDEBUG_N_TIMES(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Debug, dispatchAction, __VA_ARGS__)
- #define CERROR_N_TIMES(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Error, dispatchAction, __VA_ARGS__)
- #define CFATAL_N_TIMES(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Fatal, dispatchAction, __VA_ARGS__)
- #define CTRACE_N_TIMES(writer, n, dispatchAction, ...) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Trace, dispatchAction, __VA_ARGS__)

- #define CVERBOSE_N_TIMES(writer, n, vlevel, dispatchAction, ...) CVERBOSE_IF(writer, ELPP->validateNTimesCounter(__FILE__, __LINE__, n), vlevel, dispatchAction, __VA_ARGS__)
- #define CLOG(LEVEL, ...) C##LEVEL(el::base::Writer, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CVLOG(vlevel, ...) CVERBOSE(el::base::Writer, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CLOG_IF(condition, LEVEL, ...) C##LEVEL##_IF(el::base::Writer, condition, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CVLOG_IF(condition, vlevel, ...) CVERBOSE_IF(el::base::Writer, condition, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CLOG_EVERY_N(n, LEVEL, ...) C##LEVEL##_EVERY_N(el::base::Writer, n, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CVLOG_EVERY_N(n, vlevel, ...) CVERBOSE_EVERY_N(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CLOG_AFTER_N(n, LEVEL, ...) C##LEVEL##_AFTER_N(el::base::Writer, n, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CVLOG_AFTER_N(n, vlevel, ...) CVERBOSE_AFTER_N(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CLOG_N_TIMES(n, LEVEL, ...) C##LEVEL##_N_TIMES(el::base::Writer, n, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CVLOG_N_TIMES(n, vlevel, ...) CVERBOSE_N_TIMES(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define ELPP_CURR_FILE_LOGGER_ID el::base::consts::kDefaultLoggerId
- #define ELPP_TRACE CLOG(TRACE, ELPP_CURR_FILE_LOGGER_ID)
- #define LOG(LEVEL) CLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define VLOG(vlevel) CVLOG(vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define LOG_IF(condition, LEVEL) CLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define VLOG_IF(condition, vlevel) CVLOG_IF(condition, vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define LOG_EVERY_N(n, LEVEL) CLOG_EVERY_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define VLOG_EVERY_N(n, vlevel) CVLOG_EVERY_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define LOG_AFTER_N(n, LEVEL) CLOG_AFTER_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define VLOG_AFTER_N(n, vlevel) CVLOG_AFTER_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define LOG_N_TIMES(n, LEVEL) CLOG_N_TIMES(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define VLOG_N_TIMES(n, vlevel) CVLOG_N_TIMES(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define CPLOG(LEVEL, ...) C##LEVEL(el::base::PErrorWriter, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define CPLOG_IF(condition, LEVEL, ...) C##LEVEL##_IF(el::base::PErrorWriter, condition, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define DCPLOG(LEVEL, ...) if (ELPP_DEBUG_LOG) C##LEVEL(el::base::PErrorWriter, el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define DCPLOG_IF(condition, LEVEL, ...) C##LEVEL##_IF(el::base::PErrorWriter, (ELPP_DEBUG_LOG) && (condition), el::base::DispatchAction::NormalLog, __VA_ARGS__)
- #define PLOG(LEVEL) CPLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define PLOG_IF(condition, LEVEL) CPLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define DPLOG(LEVEL) DCPLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define DPLOG_IF(condition, LEVEL) DCPLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define CSYSLOG(LEVEL, ...) el::base::NullWriter()
- #define CSYSLOG_IF(condition, LEVEL, ...) el::base::NullWriter()
- #define CSYSLOG_EVERY_N(n, LEVEL, ...) el::base::NullWriter()
- #define CSYSLOG_AFTER_N(n, LEVEL, ...) el::base::NullWriter()
- #define CSYSLOG_N_TIMES(n, LEVEL, ...) el::base::NullWriter()
- #define SYSLOG(LEVEL) el::base::NullWriter()
- #define SYSLOG_IF(condition, LEVEL) el::base::NullWriter()
- #define SYSLOG_EVERY_N(n, LEVEL) el::base::NullWriter()
- #define SYSLOG_AFTER_N(n, LEVEL) el::base::NullWriter()

- #define SYSLOG_N_TIMES(n, LEVEL) el::base::NullWriter()
- #define DCSYSLOG(LEVEL, ...) el::base::NullWriter()
- #define DCSYSLOG_IF(condition, LEVEL, ...) el::base::NullWriter()
- #define DCSYSLOG_EVERY_N(n, LEVEL, ...) el::base::NullWriter()
- #define DCSYSLOG_AFTER_N(n, LEVEL, ...) el::base::NullWriter()
- #define DCSYSLOG_N_TIMES(n, LEVEL, ...) el::base::NullWriter()
- #define DSYSLOG(LEVEL) el::base::NullWriter()
- #define DSYSLOG_IF(condition, LEVEL) el::base::NullWriter()
- #define DSYSLOG_EVERY_N(n, LEVEL) el::base::NullWriter()
- #define DSYSLOG_AFTER_N(n, LEVEL) el::base::NullWriter()
- #define DSYSLOG_N_TIMES(n, LEVEL) el::base::NullWriter()
- #define DCLOG(LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG(LEVEL, __VA_ARGS__)
- #define DCLOG_VERBOSE(vlevel, ...) if (ELPP_DEBUG_LOG) CLOG_VERBOSE(vlevel, __VA_ARGS__)
- #define DCVLOG(vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG(vlevel, __VA_ARGS__)
- #define DCLOG_IF(condition, LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG_IF(condition, LEVEL, __VA_↩ ARGS__)
- #define DCVLOG_IF(condition, vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG_IF(condition, vlevel, __VA_↩ ARGS__)
- #define DCLOG_EVERY_N(n, LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG_EVERY_N(n, LEVEL, __VA_↩ ARGS__)
- #define DCVLOG_EVERY_N(n, vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG_EVERY_N(n, vlevel, __VA_↩ ARGS__)
- #define DCLOG_AFTER_N(n, LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG_AFTER_N(n, LEVEL, __VA_↩ ARGS__)
- #define DCVLOG_AFTER_N(n, vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG_AFTER_N(n, vlevel, __VA_↩ ARGS__)
- #define DCLOG_N_TIMES(n, LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG_N_TIMES(n, LEVEL, __VA_↩ ARGS__)
- #define DCVLOG_N_TIMES(n, vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG_N_TIMES(n, vlevel, __VA_↩ ARGS__)
- #define DLOG(LEVEL) DCLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define DVLOG(vlevel) DCVLOG(vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define DLOG_IF(condition, LEVEL) DCLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define DVLOG_IF(condition, vlevel) DCVLOG_IF(condition, vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define DLOG_EVERY_N(n, LEVEL) DCLOG_EVERY_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define DVLOG_EVERY_N(n, vlevel) DCVLOG_EVERY_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define DLOG_AFTER_N(n, LEVEL) DCLOG_AFTER_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define DVLOG_AFTER_N(n, vlevel) DCVLOG_AFTER_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define DLOG_N_TIMES(n, LEVEL) DCLOG_N_TIMES(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
- #define DVLOG_N_TIMES(n, vlevel) DCVLOG_N_TIMES(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
- #define CCHECK(condition, ...) CLOG_IF(!(condition), FATAL, __VA_ARGS__) << "Check failed: [" << #condition << "] "
- #define CPCHECK(condition, ...) CPLOG_IF(!(condition), FATAL, __VA_ARGS__) << "Check failed: [" << #condition << "] "
- #define CHECK(condition) CCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
- #define PCHECK(condition) CPCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
- #define CCHECK_EQ(a, b, ...) CCHECK(a == b, __VA_ARGS__)
- #define CCHECK_NE(a, b, ...) CCHECK(a != b, __VA_ARGS__)
- #define CCHECK_LT(a, b, ...) CCHECK(a < b, __VA_ARGS__)
- #define CCHECK_GT(a, b, ...) CCHECK(a > b, __VA_ARGS__)
- #define CCHECK_LE(a, b, ...) CCHECK(a <= b, __VA_ARGS__)
- #define CCHECK_GE(a, b, ...) CCHECK(a >= b, __VA_ARGS__)
- #define CCHECK_BOUNDS(val, min, max, ...) CCHECK(val >= min && val <= max, __VA_ARGS__)
- #define CHECK_EQ(a, b) CCHECK_EQ(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_NE(a, b) CCHECK_NE(a, b, ELPP_CURR_FILE_LOGGER_ID)

- #define CHECK_LT(a, b) CCHECK_LT(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_GT(a, b) CCHECK_GT(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_LE(a, b) CCHECK_LE(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_GE(a, b) CCHECK_GE(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_BOUNDS(val, min, max) CCHECK_BOUNDS(val, min, max, ELPP_CURR_FILE_LOGGER_ID)
- #define CCHECK_NOTNULL(ptr, ...) CCHECK((ptr) != nullptr, __VA_ARGS__)
- #define CCHECK_STREQ(str1, str2, ...)
- #define CCHECK_STRNE(str1, str2, ...)
- #define CCHECK_STRCASEEQ(str1, str2, ...)
- #define CCHECK_STRCASENE(str1, str2, ...)
- #define CHECK_NOTNULL(ptr) CCHECK_NOTNULL((ptr), ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_STREQ(str1, str2) CCHECK_STREQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_STRNE(str1, str2) CCHECK_STRNE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_STRCASEEQ(str1, str2) CCHECK_STRCASEEQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
- #define CHECK_STRCASENE(str1, str2) CCHECK_STRCASENE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
- #define DCCHECK(condition, ...) if (ELPP_DEBUG_LOG) CCHECK(condition, __VA_ARGS__)
- #define DCCHECK_EQ(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_EQ(a, b, __VA_ARGS__)
- #define DCCHECK_NE(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_NE(a, b, __VA_ARGS__)
- #define DCCHECK_LT(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_LT(a, b, __VA_ARGS__)
- #define DCCHECK_GT(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_GT(a, b, __VA_ARGS__)
- #define DCCHECK_LE(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_LE(a, b, __VA_ARGS__)
- #define DCCHECK_GE(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_GE(a, b, __VA_ARGS__)
- #define DCCHECK_BOUNDS(val, min, max, ...) if (ELPP_DEBUG_LOG) CCHECK_BOUNDS(val, min, max, __VA_ARGS__)
- #define DCCHECK_NOTNULL(ptr, ...) if (ELPP_DEBUG_LOG) CCHECK_NOTNULL((ptr), __VA_ARGS_↩ _)
- #define DCCHECK_STREQ(str1, str2, ...) if (ELPP_DEBUG_LOG) CCHECK_STREQ(str1, str2, __VA_↩ ARGS__)
- #define DCCHECK_STRNE(str1, str2, ...) if (ELPP_DEBUG_LOG) CCHECK_STRNE(str1, str2, __VA_↩ ARGS__)
- #define DCCHECK_STRCASEEQ(str1, str2, ...) if (ELPP_DEBUG_LOG) CCHECK_STRCASEEQ(str1, str2, __VA_ARGS__)
- #define DCCHECK_STRCASENE(str1, str2, ...) if (ELPP_DEBUG_LOG) CCHECK_STRCASENE(str1, str2, __VA_ARGS__)
- #define DCPCHECK(condition, ...) if (ELPP_DEBUG_LOG) CPCHECK(condition, __VA_ARGS__)
- #define DCHECK(condition) DCCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_EQ(a, b) DCCHECK_EQ(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_NE(a, b) DCCHECK_NE(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_LT(a, b) DCCHECK_LT(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_GT(a, b) DCCHECK_GT(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_LE(a, b) DCCHECK_LE(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_GE(a, b) DCCHECK_GE(a, b, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_BOUNDS(val, min, max) DCCHECK_BOUNDS(val, min, max, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_NOTNULL(ptr) DCCHECK_NOTNULL((ptr), ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_STREQ(str1, str2) DCCHECK_STREQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_STRNE(str1, str2) DCCHECK_STRNE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_STRCASEEQ(str1, str2) DCCHECK_STRCASEEQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
- #define DCHECK_STRCASENE(str1, str2) DCCHECK_STRCASENE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
- #define DPCHECK(condition) DCPCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
- #define ELPP_USE_DEF_CRASH_HANDLER true
- #define ELPP_CRASH_HANDLER_INIT
- #define ELPP_INIT_EASYLOGGINGPP(val)
- #define INITIALIZE_EASYLOGGINGPP ELPP_INIT_EASYLOGGINGPP(new el::base::Storage(el::LogBuilderPtr(new el::base::DefaultLogBuilder())))
- #define INITIALIZE_NULL_EASYLOGGINGPP
- #define SHARE_EASYLOGGINGPP(initializedStorage)
- #define START_EASYLOGGINGPP(argc, argv) el::Helpers::setArgs(argc, argv)

Typedefs

- typedef char el::base::type::char_t
- typedef std::string el::base::type::string_t
- typedef std::stringstream el::base::type::stringstream_t
- typedef std::fstream el::base::type::fstream_t
- typedef std::ostream el::base::type::ostream_t
- typedef unsigned int el::base::type::EnumType
- typedef unsigned short el::base::type::VerboseLevel
- typedef unsigned long int el::base::type::LineNumber
- typedef std::shared_ptr< base::Storage > el::base::type::StoragePointer
- typedef std::shared_ptr< LogDispatchCallback > el::base::type::LogDispatchCallbackPtr
- typedef std::shared_ptr< PerformanceTrackingCallback > el::base::type::PerformanceTrackingCallbackPtr
- typedef std::shared_ptr< LoggerRegistrationCallback > el::base::type::LoggerRegistrationCallbackPtr
- typedef std::unique_ptr< el::base::PerformanceTracker > el::base::type::PerformanceTrackerPtr
- typedef std::function< void(const char *, std::size_t)> el::PreRollOutCallback
- typedef SubsecondPrecision el::base::MillisecondsWidth

  Type alias of SubsecondPrecision.
- typedef base::threading::internal::NoMutex el::base::threading::Mutex
- typedef base::threading::internal::NoScopedLock< base::threading::Mutex > el::base::threading::ScopedLock
- typedef std::function< std::string(const LogMessage *)> el::FormatSpecifierValueResolver

  Resolving function for format specifier.
- typedef std::shared_ptr< base::type::fstream_t > el::base::FileStreamPtr
- typedef std::unordered_map< std::string, FileStreamPtr > el::base::LogStreamsReferenceMap
- typedef std::shared_ptr< base::LogStreamsReferenceMap > el::base::LogStreamsReferenceMapPtr
- typedef std::shared_ptr< LogBuilder > el::LogBuilderPtr

Enumerations

- enum class el::Level : base::type::EnumType {
  el::Global = 1 , el::Trace = 2 , el::Debug = 4 , el::Fatal = 8 ,
  el::Error = 16 , el::Warning = 32 , el::Verbose = 64 , el::Info = 128 ,
  el::Unknown = 1010 }

  Represents enumeration for severity level used to determine level of logging.
- enum class el::ConfigurationType : base::type::EnumType {
  el::Enabled = 1 , el::ToFile = 2 , el::ToStandardOutput = 4 , el::Format = 8 ,
  el::Filename = 16 , el::SubsecondPrecision = 32 , el::MillisecondsWidth = SubsecondPrecision ,
  el::PerformanceTracking = 64 ,
  el::MaxLogFileSize = 128 , el::LogFlushThreshold = 256 , el::Unknown = 1010 }

  Represents enumeration of ConfigurationType used to configure or access certain aspect of logging.
- enum class el::LoggingFlag : base::type::EnumType {
  el::NewLineForContainer = 1 , el::AllowVerboseIfModuleNotSpecified = 2 , el::LogDetailedCrashReason = 4
  , el::DisableApplicationAbortOnFatalLog = 8 ,
  el::ImmediateFlush = 16 , el::StrictLogFileSizeCheck = 32 , el::ColoredTerminalOutput = 64 , el::MultiLoggerSupport
  = 128 ,
  el::DisablePerformanceTrackingCheckpointComparison = 256 , el::DisableVModules = 512 , el::DisableVModulesExtensions
  = 1024 , el::HierarchicalLogging = 2048 ,
  el::CreateLoggerAutomatically = 4096 , el::AutoSpacing = 8192 , el::FixedTimeFormat = 16384 ,
  el::IgnoreSigInt = 32768 }

  Flags used while writing logs. This flags are set by user.
- enum class el::base::TimestampUnit : base::type::EnumType {
  el::base::Microsecond = 0 , el::base::Millisecond = 1 , el::base::Second = 2 , el::base::Minute = 3 ,
  el::base::Hour = 4 , el::base::Day = 5 }

  Enum to represent timestamp unit.

- enum class el::base::FormatFlags : base::type::EnumType {
  el::base::DateTime = 1 << 1 , el::base::LoggerId = 1 << 2 , el::base::File = 1 << 3 , el::base::Line = 1 << 4 ,
  el::base::Location = 1 << 5 , el::base::Function = 1 << 6 , el::base::User = 1 << 7 , el::base::Host = 1 << 8 ,
  el::base::LogMessage = 1 << 9 , el::base::VerboseLevel = 1 << 10 , el::base::AppName = 1 << 11 , el::base::ThreadId = 1 << 12 ,
  el::base::Level = 1 << 13 , el::base::FileBase = 1 << 14 , el::base::LevelShort = 1 << 15 }

  Format flags used to determine specifiers that are active for performance improvements.
- enum class el::base::DispatchAction : base::type::EnumType { el::base::None = 1 , el::base::NormalLog = 2 , el::base::SysLog = 4 }

  Action to be taken for dispatching.

Functions

- static void el::base::defaultPreRollOutCallback (const char *, std::size_t)
- template<typename T >
  static std::enable_if< std::is_pointer< T * >::value, void >::type el::base::utils::safeDelete (T *&pointer)

  Deletes memory safely and points to null.
- template<typename Enum >
  static base::type::EnumType el::base::utils::bitwise::And (Enum e, base::type::EnumType flag)
- template<typename Enum >
  static base::type::EnumType el::base::utils::bitwise::Not (Enum e, base::type::EnumType flag)
- template<typename Enum >
  static base::type::EnumType el::base::utils::bitwise::Or (Enum e, base::type::EnumType flag)
- template<typename Enum >
  static void el::base::utils::addFlag (Enum e, base::type::EnumType *flag)
- template<typename Enum >
  static void el::base::utils::removeFlag (Enum e, base::type::EnumType *flag)
- template<typename Enum >
  static bool el::base::utils::hasFlag (Enum e, base::type::EnumType flag)
- static std::string el::base::threading::getCurrentThreadId (void)

Variables

- static const char el::base::consts::kFormatSpecifierCharValue = 'v'
- static const char el::base::consts::kFormatSpecifierChar = '%'
- static const unsigned int el::base::consts::kMaxLogPerCounter = 100000
- static const unsigned int el::base::consts::kMaxLogPerContainer = 100
- static const unsigned int el::base::consts::kDefaultSubsecondPrecision = 3
- static const char * el::base::consts::kDefaultLoggerId = "default"
- static const char * el::base::consts::kFilePathSeparator = "/"
- static const std::size_t el::base::consts::kSourceFilenameMaxLength = 100
- static const std::size_t el::base::consts::kSourceLineMaxLength = 10
- static const Level el::base::consts::kPerformanceTrackerDefaultLevel = Level::Info
- struct {
    double el::base::consts::value
    const base::type::char_t * el::base::consts::unit
  } el::base::consts::kTimeFormats [ ]

- static const int el::base::consts::kTimeFormatsCount = sizeof(kTimeFormats) / sizeof(kTimeFormats[0])

- struct {
  int el::base::consts::numb
  const char * el::base::consts::name
  const char * el::base::consts::brief
  const char * el::base::consts::detail
  } el::base::consts::kCrashSignals [ ]

- static const int el::base::consts::kCrashSignalsCount = sizeof(kCrashSignals) / sizeof(kCrashSignals[0])
- ELPP_EXPORT base::type::StoragePointer el::base::elStorage
- base::debug::CrashHandler el::elCrashHandler

10.1.1 Macro Definition Documentation

10.1.1.1 CCHECK

```
#define CCHECK(
              condition,
              ...  ) CLOG_IF(!(condition), FATAL, __VA_ARGS__) << "Check failed:  [" << #condition
<< "] "
```

Definition at line 4447 of file easylogging++.h.

10.1.1.2 CCHECK_BOUNDS

```
#define CCHECK_BOUNDS(
              val,
              min,
              max,
              ...  ) CCHECK(val >= min && val <= max, __VA_ARGS__)
```

Definition at line 4457 of file easylogging++.h.

10.1.1.3 CCHECK_EQ

```
#define CCHECK_EQ(
              a,
              b,
              ...  ) CCHECK(a == b, __VA_ARGS__)
```

Definition at line 4451 of file easylogging++.h.

10.1.1.4 CCHECK_GE

```
#define CCHECK_GE(
              a,
              b,
              ...  ) CCHECK(a >= b, __VA_ARGS__)
```

Definition at line 4456 of file easylogging++.h.

10.1.1.5 CCHECK_GT

```
#define CCHECK_GT(
              a,
              b,
              ...  ) CCHECK(a > b, __VA_ARGS__)
```

Definition at line 4454 of file easylogging++.h.

10.1.1.6 CCHECK_LE

```
#define CCHECK_LE(
              a,
              b,
              ...  ) CCHECK(a <= b, __VA_ARGS__)
```

Definition at line 4455 of file easylogging++.h.

10.1.1.7 CCHECK_LT

```
#define CCHECK_LT(
              a,
              b,
              ...  ) CCHECK(a < b, __VA_ARGS__)
```

Definition at line 4453 of file easylogging++.h.

10.1.1.8 CCHECK_NE

```
#define CCHECK_NE(
              a,
              b,
              ...  ) CCHECK(a != b, __VA_ARGS__)
```

Definition at line 4452 of file easylogging++.h.

10.1.1.9 CCHECK_NOTNULL

```
#define CCHECK_NOTNULL(
              ptr,
              ...  ) CCHECK((ptr) != nullptr, __VA_ARGS__)
```

Definition at line 4465 of file easylogging++.h.

10.1.1.10 CCHECK_STRCASEEQ

```
#define CCHECK_STRCASEEQ(
              str1,
              str2,
              ... )
```

Value:
```
CLOG_IF(!el::base::utils::Str::cStringCaseEq(str1, str2), FATAL, __VA_ARGS__) \
« "Check failed: [" « #str1 « " == " « #str2 « "] "
```

Definition at line 4470 of file easylogging++.h.

10.1.1.11 CCHECK_STRCASENE

```
#define CCHECK_STRCASENE(
              str1,
              str2,
              ... )
```

Value:
```
CLOG_IF(el::base::utils::Str::cStringCaseEq(str1, str2), FATAL, __VA_ARGS__) \
« "Check failed: [" « #str1 « " != " « #str2 « "] "
```

Definition at line 4472 of file easylogging++.h.

10.1.1.12 CCHECK_STREQ

```
#define CCHECK_STREQ(
              str1,
              str2,
              ... )
```

Value:
```
CLOG_IF(!el::base::utils::Str::cStringEq(str1, str2), FATAL, __VA_ARGS__) \
« "Check failed: [" « #str1 « " == " « #str2 « "] "
```

Definition at line 4466 of file easylogging++.h.

10.1.1.13 CCHECK_STRNE

```
#define CCHECK_STRNE(
              str1,
              str2,
              ... )
```

Value:
```
CLOG_IF(el::base::utils::Str::cStringEq(str1, str2), FATAL, __VA_ARGS__) \
« "Check failed: [" « #str1 « " != " « #str2 « "] "
```

Definition at line 4468 of file easylogging++.h.

10.1.1.14 CDEBUG

```
#define CDEBUG(
              writer,
              dispatchAction,
              ... ) ELPP_WRITE_LOG(writer, el::Level::Debug, dispatchAction, __VA_ARGS__)
```

Definition at line 4003 of file easylogging++.h.

10.1.1.15 CDEBUG_AFTER_N

```
#define CDEBUG_AFTER_N(
              writer,
              n,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Debug, dispatchAction, __VA↩
_ARGS__)
```

Definition at line 4128 of file easylogging++.h.

10.1.1.16 CDEBUG_EVERY_N

```
#define CDEBUG_EVERY_N(
              writer,
              occasion,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Debug, dispatch↩
Action, __VA_ARGS__)
```

Definition at line 4085 of file easylogging++.h.

10.1.1.17 CDEBUG_IF

```
#define CDEBUG_IF(
              writer,
              condition_,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Debug, dispatchAction,
__VA_ARGS__)
```

Definition at line 4042 of file easylogging++.h.

10.1.1.18 CDEBUG_N_TIMES

```
#define CDEBUG_N_TIMES(
              writer,
              n,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Debug, dispatchAction, __VA↩
_ARGS__)
```

Definition at line 4171 of file easylogging++.h.

10.1.1.19 CERROR

```
#define CERROR(
              writer,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG(writer, el::Level::Error, dispatchAction, __VA_ARGS__)
```

Definition at line 4008 of file easylogging++.h.

10.1.1.20 CERROR_AFTER_N

```
#define CERROR_AFTER_N(
              writer,
              n,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Error, dispatchAction, __VA↩
_ARGS__)
```

Definition at line 4134 of file easylogging++.h.

10.1.1.21 CERROR_EVERY_N

```
#define CERROR_EVERY_N(
              writer,
              occasion,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Error, dispatch↩
Action, __VA_ARGS__)
```

Definition at line 4091 of file easylogging++.h.

10.1.1.22 CERROR_IF

```
#define CERROR_IF(
              writer,
              condition_,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Error, dispatchAction,
__VA_ARGS__)
```

Definition at line 4048 of file easylogging++.h.

10.1.1.23 CERROR_N_TIMES

```
#define CERROR_N_TIMES(
              writer,
              n,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Error, dispatchAction, __VA↩
_ARGS__)
```

Definition at line 4177 of file easylogging++.h.

10.1.1.24 CFATAL

```
#define CFATAL(
              writer,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG(writer, el::Level::Fatal, dispatchAction, __VA_ARGS__)
```

Definition at line 4013 of file easylogging++.h.

10.1.1.25 CFATAL_AFTER_N

```
#define CFATAL_AFTER_N(
              writer,
              n,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Fatal, dispatchAction, __VA↩
_ARGS__)
```

Definition at line 4140 of file easylogging++.h.

10.1.1.26 CFATAL_EVERY_N

```
#define CFATAL_EVERY_N(
              writer,
              occasion,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Fatal, dispatch↩
Action, __VA_ARGS__)
```

Definition at line 4097 of file easylogging++.h.

10.1.1.27 CFATAL_IF

```
#define CFATAL_IF(
              writer,
              condition_,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Fatal, dispatchAction,
__VA_ARGS__)
```

Definition at line 4054 of file easylogging++.h.

10.1.1.28 CFATAL_N_TIMES

```
#define CFATAL_N_TIMES(
              writer,
              n,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Fatal, dispatchAction, __VA↩
_ARGS__)
```

Definition at line 4183 of file easylogging++.h.

10.1.1.29 CHECK

```
#define CHECK(
              condition ) CCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4449 of file easylogging++.h.

10.1.1.30 CHECK_BOUNDS

```
#define CHECK_BOUNDS(
              val,
              min,
              max ) CCHECK_BOUNDS(val, min, max, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4464 of file easylogging++.h.

10.1.1.31 CHECK_EQ

```
#define CHECK_EQ(
              a,
              b ) CCHECK_EQ(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4458 of file easylogging++.h.

10.1.1.32 CHECK_GE

```
#define CHECK_GE(
              a,
              b ) CCHECK_GE(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4463 of file easylogging++.h.

10.1.1.33 CHECK_GT

```
#define CHECK_GT(
              a,
              b ) CCHECK_GT(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4461 of file easylogging++.h.

10.1.1.34 CHECK_LE

```
#define CHECK_LE(
              a,
              b ) CCHECK_LE(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4462 of file easylogging++.h.

10.1.1.35 CHECK_LT

```
#define CHECK_LT(
              a,
              b ) CCHECK_LT(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4460 of file easylogging++.h.

10.1.1.36 CHECK_NE

```
#define CHECK_NE(
              a,
              b ) CCHECK_NE(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4459 of file easylogging++.h.

10.1.1.37 CHECK_NOTNULL

```
#define CHECK_NOTNULL(
              ptr ) CCHECK_NOTNULL((ptr), ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4474 of file easylogging++.h.

10.1.1.38 CHECK_STRCASEEQ

```
#define CHECK_STRCASEEQ(
              str1,
              str2 ) CCHECK_STRCASEEQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4477 of file easylogging++.h.

10.1.1.39 CHECK_STRCASENE

```
#define CHECK_STRCASENE(
              str1,
              str2 ) CCHECK_STRCASENE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4478 of file easylogging++.h.

10.1.1.40 CHECK_STREQ

```
#define CHECK_STREQ(
              str1,
              str2 ) CCHECK_STREQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4475 of file easylogging++.h.

10.1.1.41 CHECK_STRNE

```
#define CHECK_STRNE(
              str1,
              str2 ) CCHECK_STRNE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4476 of file easylogging++.h.

10.1.1.42 CINFO

```
#define CINFO(
              writer,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG(writer, el::Level::Info, dispatchAction, __VA_ARGS__)
```

Definition at line 3993 of file easylogging++.h.

10.1.1.43 CINFO_AFTER_N

```
#define CINFO_AFTER_N(
              writer,
              n,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Info, dispatchAction, __VA_↩
ARGS__)
```

Definition at line 4116 of file easylogging++.h.

10.1.1.44 CINFO_EVERY_N

```
#define CINFO_EVERY_N(
              writer,
              occasion,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Info, dispatchAction,
__VA_ARGS__)
```

Definition at line 4073 of file easylogging++.h.

10.1.1.45 CINFO_IF

```
#define CINFO_IF(
              writer,
              condition_,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Info, dispatchAction,
__VA_ARGS__)
```

Definition at line 4030 of file easylogging++.h.

10.1.1.46 CINFO_N_TIMES

```
#define CINFO_N_TIMES(
              writer,
              n,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Info, dispatchAction, __VA_↩
ARGS__)
```

Definition at line 4159 of file easylogging++.h.

10.1.1.47 CLOG

```
#define CLOG(
              LEVEL,
              ... ) C##LEVEL(el::base::Writer, el::base::DispatchAction::NormalLog, __VA_↩
ARGS__)
```

Definition at line 4217 of file easylogging++.h.

10.1.1.48 CLOG_AFTER_N

```
#define CLOG_AFTER_N(
              n,
              LEVEL,
              ... ) C##LEVEL##_AFTER_N(el::base::Writer, n, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4230 of file easylogging++.h.

10.1.1.49 CLOG_EVERY_N

```
#define CLOG_EVERY_N(
              n,
              LEVEL,
              ... ) C##LEVEL##_EVERY_N(el::base::Writer, n, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4226 of file easylogging++.h.

10.1.1.50 CLOG_IF

```
#define CLOG_IF(
              condition,
              LEVEL,
              ... ) C##LEVEL##_IF(el::base::Writer, condition, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4221 of file easylogging++.h.

10.1.1.51 CLOG_N_TIMES

```
#define CLOG_N_TIMES(
              n,
              LEVEL,
              ...  ) C##LEVEL##_N_TIMES(el::base::Writer, n, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4234 of file easylogging++.h.

10.1.1.52 CPCHECK

```
#define CPCHECK(
              condition,
              ...  ) CPLOG_IF(!(condition), FATAL, __VA_ARGS__) << "Check failed:  [" <<
#condition << "] "
```

Definition at line 4448 of file easylogging++.h.

10.1.1.53 CPLOG

```
#define CPLOG(
              LEVEL,
              ...  ) C##LEVEL(el::base::PErrorWriter, el::base::DispatchAction::NormalLog, __↩
VA_ARGS__)
```

Definition at line 4282 of file easylogging++.h.

10.1.1.54 CPLOG_IF

```
#define CPLOG_IF(
              condition,
              LEVEL,
              ...  ) C##LEVEL##_IF(el::base::PErrorWriter, condition, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4284 of file easylogging++.h.

10.1.1.55 CSYSLOG

```
#define CSYSLOG(
              LEVEL,
              ...  ) el::base::NullWriter()
```

Definition at line 4343 of file easylogging++.h.

10.1.1.56 CSYSLOG_AFTER_N

```
#define CSYSLOG_AFTER_N(
              n,
              LEVEL,
              ... ) el::base::NullWriter()
```

Definition at line 4346 of file easylogging++.h.

10.1.1.57 CSYSLOG_EVERY_N

```
#define CSYSLOG_EVERY_N(
              n,
              LEVEL,
              ... ) el::base::NullWriter()
```

Definition at line 4345 of file easylogging++.h.

10.1.1.58 CSYSLOG_IF

```
#define CSYSLOG_IF(
              condition,
              LEVEL,
              ... ) el::base::NullWriter()
```

Definition at line 4344 of file easylogging++.h.

10.1.1.59 CSYSLOG_N_TIMES

```
#define CSYSLOG_N_TIMES(
              n,
              LEVEL,
              ... ) el::base::NullWriter()
```

Definition at line 4347 of file easylogging++.h.

10.1.1.60 CTRACE

```
#define CTRACE(
              writer,
              dispatchAction,
              ... ) ELPP_WRITE_LOG(writer, el::Level::Trace, dispatchAction, __VA_ARGS__)
```

Definition at line 4018 of file easylogging++.h.

10.1.1.61 CTRACE_AFTER_N

```
#define CTRACE_AFTER_N(
              writer,
              n,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Trace, dispatchAction, __VA↩
_ARGS__)
```

Definition at line 4146 of file easylogging++.h.

10.1.1.62 CTRACE_EVERY_N

```
#define CTRACE_EVERY_N(
              writer,
              occasion,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Trace, dispatch↩
Action, __VA_ARGS__)
```

Definition at line 4103 of file easylogging++.h.

10.1.1.63 CTRACE_IF

```
#define CTRACE_IF(
              writer,
              condition_,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Trace, dispatchAction,
__VA_ARGS__)
```

Definition at line 4060 of file easylogging++.h.

10.1.1.64 CTRACE_N_TIMES

```
#define CTRACE_N_TIMES(
              writer,
              n,
              dispatchAction,
              ... ) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Trace, dispatchAction, __VA↩
_ARGS__)
```

Definition at line 4189 of file easylogging++.h.

10.1.1.65 CVERBOSE

```
#define CVERBOSE(
              writer,
              vlevel,
              dispatchAction,
              ... )
```

Value:

```
if (VLOG_IS_ON(vlevel)) writer(\
el::Level::Verbose, __FILE__, __LINE__, ELPP_FUNC, dispatchAction,
      vlevel).construct(el_getVALength(__VA_ARGS__), __VA_ARGS__)
```

Definition at line 4023 of file easylogging++.h.

10.1.1.66 CVERBOSE_AFTER_N

```
#define CVERBOSE_AFTER_N(
              writer,
              n,
              vlevel,
              dispatchAction,
              ... ) CVERBOSE_IF(writer, ELPP->validateAfterNCounter(__FILE__, __LINE__, n),
vlevel, dispatchAction, __VA_ARGS__)
```

Definition at line 4152 of file easylogging++.h.

10.1.1.67 CVERBOSE_EVERY_N

```
#define CVERBOSE_EVERY_N(
              writer,
              occasion,
              vlevel,
              dispatchAction,
              ... ) CVERBOSE_IF(writer, ELPP->validateEveryNCounter(__FILE__, __LINE__↩
, occasion), vlevel, dispatchAction, __VA_ARGS__)
```

Definition at line 4109 of file easylogging++.h.

10.1.1.68 CVERBOSE_IF

```
#define CVERBOSE_IF(
              writer,
              condition_,
              vlevel,
              dispatchAction,
              ... )
```

Value:

```
if (VLOG_IS_ON(vlevel) && (condition_)) writer( \
el::Level::Verbose, __FILE__, __LINE__, ELPP_FUNC, dispatchAction,
      vlevel).construct(el_getVALength(__VA_ARGS__), __VA_ARGS__)
```

Definition at line 4066 of file easylogging++.h.

10.1.1.69 CVERBOSE_N_TIMES

```
#define CVERBOSE_N_TIMES(
              writer,
              n,
              vlevel,
              dispatchAction,
              ... ) CVERBOSE_IF(writer, ELPP->validateNTimesCounter(__FILE__, __LINE__, n),
vlevel, dispatchAction, __VA_ARGS__)
```

Definition at line 4195 of file easylogging++.h.

10.1.1.70 CVLOG

```
#define CVLOG(
              vlevel,
              ... ) CVERBOSE(el::base::Writer, vlevel, el::base::DispatchAction::NormalLog, ↩
__VA_ARGS__)
```

Definition at line 4219 of file easylogging++.h.

10.1.1.71 CVLOG_AFTER_N

```
#define CVLOG_AFTER_N(
              n,
              vlevel,
              ... ) CVERBOSE_AFTER_N(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4232 of file easylogging++.h.

10.1.1.72 CVLOG_EVERY_N

```
#define CVLOG_EVERY_N(
              n,
              vlevel,
              ... ) CVERBOSE_EVERY_N(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4228 of file easylogging++.h.

10.1.1.73 CVLOG_IF

```
#define CVLOG_IF(
              condition,
              vlevel,
              ... ) CVERBOSE_IF(el::base::Writer, condition, vlevel, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4223 of file easylogging++.h.

10.1.1.74 CVLOG_N_TIMES

```
#define CVLOG_N_TIMES(
              n,
              vlevel,
              ... ) CVERBOSE_N_TIMES(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4236 of file easylogging++.h.

10.1.1.75 CWARNING

```
#define CWARNING(
              writer,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG(writer, el::Level::Warning, dispatchAction, __VA_ARGS__)
```

Definition at line 3998 of file easylogging++.h.

10.1.1.76 CWARNING_AFTER_N

```
#define CWARNING_AFTER_N(
              writer,
              n,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Warning, dispatchAction, __↩
VA_ARGS__)
```

Definition at line 4122 of file easylogging++.h.

10.1.1.77 CWARNING_EVERY_N

```
#define CWARNING_EVERY_N(
              writer,
              occasion,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Warning, dispatch↩
Action, __VA_ARGS__)
```

Definition at line 4079 of file easylogging++.h.

10.1.1.78 CWARNING_IF

```
#define CWARNING_IF(
              writer,
              condition_,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Warning, dispatch↩
Action, __VA_ARGS__)
```

Definition at line 4036 of file easylogging++.h.

10.1.1.79 CWARNING_N_TIMES

```
#define CWARNING_N_TIMES(
              writer,
              n,
              dispatchAction,
              ...  ) ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Warning, dispatchAction, __↩
VA_ARGS__)
```

Definition at line 4165 of file easylogging++.h.

10.1.1.80 DCCHECK

```
#define DCCHECK(
              condition,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK(condition, __VA_ARGS__)
```

Definition at line 4503 of file easylogging++.h.

10.1.1.81 DCCHECK_BOUNDS

```
#define DCCHECK_BOUNDS(
              val,
              min,
              max,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_BOUNDS(val, min, max, __VA_ARGS__)
```

Definition at line 4510 of file easylogging++.h.

10.1.1.82 DCCHECK_EQ

```
#define DCCHECK_EQ(
              a,
              b,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_EQ(a, b, __VA_ARGS__)
```

Definition at line 4504 of file easylogging++.h.

10.1.1.83 DCCHECK_GE

```
#define DCCHECK_GE(
              a,
              b,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_GE(a, b, __VA_ARGS__)
```

Definition at line 4509 of file easylogging++.h.

10.1.1.84 DCCHECK_GT

```
#define DCCHECK_GT(
              a,
              b,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_GT(a, b, __VA_ARGS__)
```

Definition at line 4507 of file easylogging++.h.

10.1.1.85 DCCHECK_LE

```
#define DCCHECK_LE(
              a,
              b,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_LE(a, b, __VA_ARGS__)
```

Definition at line 4508 of file easylogging++.h.

10.1.1.86 DCCHECK_LT

```
#define DCCHECK_LT(
              a,
              b,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_LT(a, b, __VA_ARGS__)
```

Definition at line 4506 of file easylogging++.h.

10.1.1.87 DCCHECK_NE

```
#define DCCHECK_NE(
              a,
              b,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_NE(a, b, __VA_ARGS__)
```

Definition at line 4505 of file easylogging++.h.

10.1.1.88 DCCHECK_NOTNULL

```
#define DCCHECK_NOTNULL(
              ptr,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_NOTNULL((ptr), __VA_ARGS__)
```

Definition at line 4511 of file easylogging++.h.

10.1.1.89 DCCHECK_STRCASEEQ

```
#define DCCHECK_STRCASEEQ(
              str1,
              str2,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_STRCASEEQ(str1, str2, __VA_ARGS__)
```

Definition at line 4514 of file easylogging++.h.

10.1.1.90 DCCHECK_STRCASENE

```
#define DCCHECK_STRCASENE(
              str1,
              str2,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_STRCASENE(str1, str2, __VA_ARGS__)
```

Definition at line 4515 of file easylogging++.h.

10.1.1.91 DCCHECK_STREQ

```
#define DCCHECK_STREQ(
              str1,
              str2,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_STREQ(str1, str2, __VA_ARGS__)
```

Definition at line 4512 of file easylogging++.h.

10.1.1.92 DCCHECK_STRNE

```
#define DCCHECK_STRNE(
              str1,
              str2,
              ...  ) if (ELPP_DEBUG_LOG) CCHECK_STRNE(str1, str2, __VA_ARGS__)
```

Definition at line 4513 of file easylogging++.h.

10.1.1.93 DCHECK

```
#define DCHECK(
              condition ) DCCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4517 of file easylogging++.h.

10.1.1.94 DCHECK_BOUNDS

```
#define DCHECK_BOUNDS(
              val,
              min,
              max ) DCCHECK_BOUNDS(val, min, max, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4524 of file easylogging++.h.

10.1.1.95 DCHECK_EQ

```
#define DCHECK_EQ(
              a,
              b ) DCCHECK_EQ(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4518 of file easylogging++.h.

10.1.1.96 DCHECK_GE

```
#define DCHECK_GE(
              a,
              b ) DCCHECK_GE(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4523 of file easylogging++.h.

10.1.1.97 DCHECK_GT

```
#define DCHECK_GT(
              a,
              b ) DCCHECK_GT(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4521 of file easylogging++.h.

10.1.1.98 DCHECK_LE

```
#define DCHECK_LE(
              a,
              b ) DCCHECK_LE(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4522 of file easylogging++.h.

10.1.1.99 DCHECK_LT

```
#define DCHECK_LT(
              a,
              b ) DCCHECK_LT(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4520 of file easylogging++.h.

10.1.1.100 DCHECK_NE

```
#define DCHECK_NE(
              a,
              b ) DCCHECK_NE(a, b, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4519 of file easylogging++.h.

10.1.1.101 DCHECK_NOTNULL

```
#define DCHECK_NOTNULL(
              ptr ) DCCHECK_NOTNULL((ptr), ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4525 of file easylogging++.h.

10.1.1.102 DCHECK_STRCASEEQ

```
#define DCHECK_STRCASEEQ(
              str1,
              str2 ) DCCHECK_STRCASEEQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4528 of file easylogging++.h.

10.1.1.103 DCHECK_STRCASENE

```
#define DCHECK_STRCASENE(
              str1,
              str2 ) DCCHECK_STRCASENE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4529 of file easylogging++.h.

10.1.1.104 DCHECK_STREQ

```
#define DCHECK_STREQ(
              str1,
              str2 ) DCCHECK_STREQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4526 of file easylogging++.h.

10.1.1.105 DCHECK_STRNE

```
#define DCHECK_STRNE(
              str1,
              str2 ) DCCHECK_STRNE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4527 of file easylogging++.h.

10.1.1.106 DCLOG

```
#define DCLOG(
              LEVEL,
              ...  ) if (ELPP_DEBUG_LOG) CLOG(LEVEL, __VA_ARGS__)
```

Definition at line 4379 of file easylogging++.h.

10.1.1.107 DCLOG_AFTER_N

```
#define DCLOG_AFTER_N(
              n,
              LEVEL,
              ...  ) if (ELPP_DEBUG_LOG) CLOG_AFTER_N(n, LEVEL, __VA_ARGS__)
```

Definition at line 4388 of file easylogging++.h.

10.1.1.108 DCLOG_EVERY_N

```
#define DCLOG_EVERY_N(
              n,
              LEVEL,
              ...  ) if (ELPP_DEBUG_LOG) CLOG_EVERY_N(n, LEVEL, __VA_ARGS__)
```

Definition at line 4386 of file easylogging++.h.

10.1.1.109 DCLOG_IF

```
#define DCLOG_IF(
              condition,
              LEVEL,
              ...  ) if (ELPP_DEBUG_LOG) CLOG_IF(condition, LEVEL, __VA_ARGS__)
```

Definition at line 4383 of file easylogging++.h.

10.1.1.110 DCLOG_N_TIMES

```
#define DCLOG_N_TIMES(
              n,
              LEVEL,
              ...  ) if (ELPP_DEBUG_LOG) CLOG_N_TIMES(n, LEVEL, __VA_ARGS__)
```

Definition at line 4390 of file easylogging++.h.

10.1.1.111 DCLOG_VERBOSE

```
#define DCLOG_VERBOSE(
              vlevel,
              ...  ) if (ELPP_DEBUG_LOG) CLOG_VERBOSE(vlevel, __VA_ARGS__)
```

Definition at line 4380 of file easylogging++.h.

10.1.1.112 DCPCHECK

```
#define DCPCHECK(
              condition,
              ...  ) if (ELPP_DEBUG_LOG) CPCHECK(condition, __VA_ARGS__)
```

Definition at line 4516 of file easylogging++.h.

10.1.1.113 DCPLOG

```
#define DCPLOG(
              LEVEL,
              ...  ) if (ELPP_DEBUG_LOG) C##LEVEL(el::base::PErrorWriter, el::base::DispatchAction::NormalLog,
__VA_ARGS__)
```

Definition at line 4286 of file easylogging++.h.

10.1.1.114 DCPLOG_IF

```
#define DCPLOG_IF(
              condition,
              LEVEL,
              ...  ) C##LEVEL##_IF(el::base::PErrorWriter, (ELPP_DEBUG_LOG) && (condition),
el::base::DispatchAction::NormalLog, __VA_ARGS__)
```

Definition at line 4288 of file easylogging++.h.

10.1.1.115 DCSYSLOG

```
#define DCSYSLOG(
              LEVEL,
              ...  ) el::base::NullWriter()
```

Definition at line 4353 of file easylogging++.h.

10.1.1.116 DCSYSLOG_AFTER_N

```
#define DCSYSLOG_AFTER_N(
              n,
              LEVEL,
              ... ) el::base::NullWriter()
```

Definition at line 4356 of file easylogging++.h.

10.1.1.117 DCSYSLOG_EVERY_N

```
#define DCSYSLOG_EVERY_N(
              n,
              LEVEL,
              ... ) el::base::NullWriter()
```

Definition at line 4355 of file easylogging++.h.

10.1.1.118 DCSYSLOG_IF

```
#define DCSYSLOG_IF(
              condition,
              LEVEL,
              ... ) el::base::NullWriter()
```

Definition at line 4354 of file easylogging++.h.

10.1.1.119 DCSYSLOG_N_TIMES

```
#define DCSYSLOG_N_TIMES(
              n,
              LEVEL,
              ... ) el::base::NullWriter()
```

Definition at line 4357 of file easylogging++.h.

10.1.1.120 DCVLOG

```
#define DCVLOG(
              vlevel,
              ... ) if (ELPP_DEBUG_LOG) CVLOG(vlevel, __VA_ARGS__)
```

Definition at line 4381 of file easylogging++.h.

10.1.1.121 DCVLOG_AFTER_N

```
#define DCVLOG_AFTER_N(
              n,
              vlevel,
              ... ) if (ELPP_DEBUG_LOG) CVLOG_AFTER_N(n, vlevel, __VA_ARGS__)
```

Definition at line 4389 of file easylogging++.h.

10.1.1.122 DCVLOG_EVERY_N

```
#define DCVLOG_EVERY_N(
              n,
              vlevel,
              ...  ) if (ELPP_DEBUG_LOG) CVLOG_EVERY_N(n, vlevel, __VA_ARGS__)
```

Definition at line 4387 of file easylogging++.h.

10.1.1.123 DCVLOG_IF

```
#define DCVLOG_IF(
              condition,
              vlevel,
              ...  ) if (ELPP_DEBUG_LOG) CVLOG_IF(condition, vlevel, __VA_ARGS__)
```

Definition at line 4384 of file easylogging++.h.

10.1.1.124 DCVLOG_N_TIMES

```
#define DCVLOG_N_TIMES(
              n,
              vlevel,
              ...  ) if (ELPP_DEBUG_LOG) CVLOG_N_TIMES(n, vlevel, __VA_ARGS__)
```

Definition at line 4391 of file easylogging++.h.

10.1.1.125 DLOG

```
#define DLOG(
              LEVEL ) DCLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4408 of file easylogging++.h.

10.1.1.126 DLOG_AFTER_N

```
#define DLOG_AFTER_N(
              n,
              LEVEL ) DCLOG_AFTER_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4416 of file easylogging++.h.

10.1.1.127 DLOG_EVERY_N

```
#define DLOG_EVERY_N(
              n,
              LEVEL ) DCLOG_EVERY_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4414 of file easylogging++.h.

10.1.1.128 DLOG_IF

```
#define DLOG_IF(
              condition,
              LEVEL ) DCLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4411 of file easylogging++.h.

10.1.1.129 DLOG_N_TIMES

```
#define DLOG_N_TIMES(
              n,
              LEVEL ) DCLOG_N_TIMES(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4418 of file easylogging++.h.

10.1.1.130 DPCHECK

```
#define DPCHECK(
              condition ) DCPCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4530 of file easylogging++.h.

10.1.1.131 DPLOG

```
#define DPLOG(
              LEVEL ) DCPLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4292 of file easylogging++.h.

10.1.1.132 DPLOG_IF

```
#define DPLOG_IF(
              condition,
              LEVEL ) DCPLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4293 of file easylogging++.h.

10.1.1.133 DSYSLOG

```
#define DSYSLOG(
              LEVEL ) el::base::NullWriter()
```

Definition at line 4358 of file easylogging++.h.

10.1.1.134 DSYSLOG_AFTER_N

```
#define DSYSLOG_AFTER_N(
              n,
              LEVEL ) el::base::NullWriter()
```

Definition at line 4361 of file easylogging++.h.

10.1.1.135 DSYSLOG_EVERY_N

```
#define DSYSLOG_EVERY_N(
              n,
              LEVEL ) el::base::NullWriter()
```

Definition at line 4360 of file easylogging++.h.

10.1.1.136 DSYSLOG_IF

```
#define DSYSLOG_IF(
              condition,
              LEVEL ) el::base::NullWriter()
```

Definition at line 4359 of file easylogging++.h.

10.1.1.137 DSYSLOG_N_TIMES

```
#define DSYSLOG_N_TIMES(
              n,
              LEVEL ) el::base::NullWriter()
```

Definition at line 4362 of file easylogging++.h.

10.1.1.138 DVLOG

```
#define DVLOG(
              vlevel ) DCVLOG(vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4409 of file easylogging++.h.

10.1.1.139 DVLOG_AFTER_N

```
#define DVLOG_AFTER_N(
              n,
              vlevel ) DCVLOG_AFTER_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4417 of file easylogging++.h.

10.1.1.140 DVLOG_EVERY_N

```
#define DVLOG_EVERY_N(
              n,
              vlevel ) DCVLOG_EVERY_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4415 of file easylogging++.h.

10.1.1.141 DVLOG_IF

```
#define DVLOG_IF(
              condition,
              vlevel ) DCVLOG_IF(condition, vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4412 of file easylogging++.h.

10.1.1.142 DVLOG_N_TIMES

```
#define DVLOG_N_TIMES(
              n,
              vlevel ) DCVLOG_N_TIMES(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4419 of file easylogging++.h.

10.1.1.143 el_getVALength

```
#define el_getVALength(
              ...  ) el_resolveVALength(0, ## __VA_ARGS__, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0)
```

Definition at line 3391 of file easylogging++.h.

10.1.1.144 el_resolveVALength

```
#define el_resolveVALength(
              _0,
              _1,
              _2,
              _3,
              _4,
              _5,
              _6,
              _7,
              _8,
              _9,
              _10,
              N,
              ...  ) N
```

Definition at line 3394 of file easylogging++.h.

10.1.1.145 ELPP

```
#define ELPP el::base::elStorage
```

Definition at line 2725 of file easylogging++.h.

10.1.1.146 ELPP_ASSERT

```
#define ELPP_ASSERT(
              expr,
              msg )
```

Value:

```
if (!(expr)) { \
std::stringstream internalInfoStream; internalInfoStream « msg; \
ELPP_INTERNAL_DEBUGGING_OUT_ERROR\
« "ASSERTION FAILURE FROM EASYLOGGING++ (LINE: " \
« __LINE__ « ") [" #expr « "] WITH MESSAGE \"" « ELPP_INTERNAL_DEBUGGING_MSG(internalInfoStream.str()) «
     "\"" \
« ELPP_INTERNAL_DEBUGGING_ENDL; }
```

Definition at line 163 of file easylogging++.h.

10.1.1.147 ELPP_ASYNC_LOGGING

```
#define ELPP_ASYNC_LOGGING 0
```

Definition at line 274 of file easylogging++.h.

10.1.1.148 ELPP_COMPILER_CLANG

```
#define ELPP_COMPILER_CLANG 0
```

Definition at line 50 of file easylogging++.h.

10.1.1.149 ELPP_COMPILER_GCC

```
#define ELPP_COMPILER_GCC 0
```

Definition at line 22 of file easylogging++.h.

10.1.1.150 ELPP_COMPILER_INTEL

```
#define ELPP_COMPILER_INTEL 0
```

Definition at line 73 of file easylogging++.h.

10.1.1.151 ELPP_COMPILER_MSVC

```
#define ELPP_COMPILER_MSVC 0
```

Definition at line 36 of file easylogging++.h.

10.1.1.152 ELPP_COUNTER

```
#define ELPP_COUNTER (ELPP->hitCounters()->getCounter(__FILE__, __LINE__))
```

Gets hit counter for file/line.

Definition at line 3944 of file easylogging++.h.

10.1.1.153 ELPP_COUNTER_POS

```
#define ELPP_COUNTER_POS (ELPP_COUNTER == nullptr ?  -1 :  ELPP_COUNTER->hitCounts())
```

Gets hit counter position for file/line, -1 if not registered yet.

Definition at line 3946 of file easylogging++.h.

10.1.1.154 ELPP_COUT

```
#define ELPP_COUT std::cout
```

Definition at line 526 of file easylogging++.h.

10.1.1.155 ELPP_COUT_LINE

```
#define ELPP_COUT_LINE(
              logLine ) logLine << std::flush
```

Definition at line 537 of file easylogging++.h.

10.1.1.156 ELPP_CRASH_HANDLER_INIT

```
#define ELPP_CRASH_HANDLER_INIT
```

Definition at line 4537 of file easylogging++.h.

10.1.1.157 ELPP_CRT_DBG_WARNINGS

```
#define ELPP_CRT_DBG_WARNINGS ELPP_COMPILER_MSVC
```

Definition at line 38 of file easylogging++.h.

10.1.1.158 ELPP_CURR_FILE_LOGGER_ID

```
#define ELPP_CURR_FILE_LOGGER_ID el::base::consts::kDefaultLoggerId
```

Definition at line 4256 of file easylogging++.h.

10.1.1.159 ELPP_CYGWIN

```
#define ELPP_CYGWIN 0
```

Definition at line 68 of file easylogging++.h.

10.1.1.160 ELPP_DEBUG_LOG

```
#define ELPP_DEBUG_LOG 1
```

Definition at line 309 of file easylogging++.h.

10.1.1.161 ELPP_ERROR_LOG

```
#define ELPP_ERROR_LOG 1
```

Definition at line 324 of file easylogging++.h.

10.1.1.162 ELPP_EXPORT

```
#define ELPP_EXPORT
```

Definition at line 235 of file easylogging++.h.

10.1.1.163 ELPP_FATAL_LOG

```
#define ELPP_FATAL_LOG 1
```

Definition at line 329 of file easylogging++.h.

10.1.1.164 ELPP_FINAL

```
#define ELPP_FINAL
```

Definition at line 267 of file easylogging++.h.

10.1.1.165 ELPP_FUNC

```
#define ELPP_FUNC ""
```

Definition at line 295 of file easylogging++.h.

10.1.1.166 ELPP_INFO_LOG

```
#define ELPP_INFO_LOG 1
```

Definition at line 314 of file easylogging++.h.

10.1.1.167 ELPP_INIT_EASYLOGGINGPP

```
#define ELPP_INIT_EASYLOGGINGPP(
              val )
```

Value:

```
namespace el { \
namespace base { \
el::base::type::StoragePointer elStorage(val); \
} \
el::base::debug::CrashHandler elCrashHandler(ELPP_USE_DEF_CRASH_HANDLER); \
}
```

Definition at line 4538 of file easylogging++.h.

10.1.1.168 ELPP_INITIALIZE_SYSLOG

```
#define ELPP_INITIALIZE_SYSLOG(
              id,
              opt,
              fac ) el::SysLogInitializer elSyslogInit(id, opt, fac)
```

Definition at line 3651 of file easylogging++.h.

10.1.1.169 ELPP_INTERNAL_DEBUGGING_ENDL

```
#define ELPP_INTERNAL_DEBUGGING_ENDL std::endl
```

Definition at line 148 of file easylogging++.h.

10.1.1.170 ELPP_INTERNAL_DEBUGGING_MSG

```
#define ELPP_INTERNAL_DEBUGGING_MSG(
              msg ) msg
```

Definition at line 151 of file easylogging++.h.

10.1.1.171 ELPP_INTERNAL_DEBUGGING_OUT_ERROR

```
#define ELPP_INTERNAL_DEBUGGING_OUT_ERROR std::cerr
```

Definition at line 145 of file easylogging++.h.

10.1.1.172 ELPP_INTERNAL_DEBUGGING_OUT_INFO

```
#define ELPP_INTERNAL_DEBUGGING_OUT_INFO std::cout
```

Definition at line 142 of file easylogging++.h.

10.1.1.173 ELPP_INTERNAL_DEBUGGING_WRITE_PERROR

```
#define ELPP_INTERNAL_DEBUGGING_WRITE_PERROR ELPP_INTERNAL_DEBUGGING_OUT_ERROR << ":  " <<
strerror(errno) << " [" << errno << "]"; (void)0
```

Definition at line 178 of file easylogging++.h.

10.1.1.174 ELPP_INTERNAL_ERROR

```
#define ELPP_INTERNAL_ERROR(
              msg,
              pe )
```

Definition at line 192 of file easylogging++.h.

10.1.1.175 ELPP_INTERNAL_INFO

```
#define ELPP_INTERNAL_INFO(
              lvl,
              msg )
```

Definition at line 206 of file easylogging++.h.

10.1.1.176 ELPP_ITERATOR_CONTAINER_LOG_FIVE_ARG

```
#define ELPP_ITERATOR_CONTAINER_LOG_FIVE_ARG(
              temp )
```

Value:

```
template <typename T1, typename T2, typename T3, typename T4, typename T5>                        \
inline MessageBuilder& operator<<(const temp<T1, T2, T3, T4, T5>& template_inst) {               \
return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
}
```

Definition at line 2922 of file easylogging++.h.

10.1.1.177 ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG

```
#define ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(
              temp )
```

Value:

```
template <typename T1, typename T2, typename T3, typename T4>                                    \
inline MessageBuilder& operator<<(const temp<T1, T2, T3, T4>& template_inst) {                   \
return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
}
```

Definition at line 2917 of file easylogging++.h.

10.1.1.178 ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG

```
#define ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(
              temp )
```

Value:

```
template <typename T>                                                                   \
inline MessageBuilder& operator<<(const temp<T>& template_inst) {                      \
return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
}
```

Definition at line 2902 of file easylogging++.h.

10.1.1.179 ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG

```
#define ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG(
              temp )
```

Value:

```
template <typename T1, typename T2, typename T3>                                        \
inline MessageBuilder& operator<<(const temp<T1, T2, T3>& template_inst) {              \
return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
}
```

Definition at line 2912 of file easylogging++.h.

10.1.1.180 ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG

```
#define ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(
              temp )
```

Value:

```
template <typename T1, typename T2>                                                     \
inline MessageBuilder& operator<<(const temp<T1, T2>& template_inst) {                 \
return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
}
```

Definition at line 2907 of file easylogging++.h.

10.1.1.181 ELPP_LITERAL

```
#define ELPP_LITERAL(
              txt ) txt
```

Definition at line 521 of file easylogging++.h.

10.1.1.182 ELPP_LOGGING_ENABLED

```
#define ELPP_LOGGING_ENABLED 1
```

Definition at line 306 of file easylogging++.h.

10.1.1.183 ELPP_MIN_UNIT

```
#define ELPP_MIN_UNIT el::base::TimestampUnit::Millisecond
```

Definition at line 3915 of file easylogging++.h.

10.1.1.184 ELPP_MINGW

```
#define ELPP_MINGW 0
```

Definition at line 63 of file easylogging++.h.

10.1.1.185 ELPP_OS_AIX

```
#define ELPP_OS_AIX 0
```

Definition at line 106 of file easylogging++.h.

10.1.1.186 ELPP_OS_ANDROID

```
#define ELPP_OS_ANDROID 0
```

Definition at line 132 of file easylogging++.h.

10.1.1.187 ELPP_OS_EMSCRIPTEN

```
#define ELPP_OS_EMSCRIPTEN 0
```

Definition at line 116 of file easylogging++.h.

10.1.1.188 ELPP_OS_FREEBSD

```
#define ELPP_OS_FREEBSD 0
```

Definition at line 96 of file easylogging++.h.

10.1.1.189 ELPP_OS_LINUX

```
#define ELPP_OS_LINUX 0
```

Definition at line 86 of file easylogging++.h.

10.1.1.190 ELPP_OS_MAC

```
#define ELPP_OS_MAC 0
```

Definition at line 91 of file easylogging++.h.

10.1.1.191 ELPP_OS_NETBSD

```
#define ELPP_OS_NETBSD 0
```

Definition at line 111 of file easylogging++.h.

10.1.1.192 ELPP_OS_QNX

```
#define ELPP_OS_QNX 0
```

Definition at line 121 of file easylogging++.h.

10.1.1.193 ELPP_OS_SOLARIS

```
#define ELPP_OS_SOLARIS 0
```

Definition at line 101 of file easylogging++.h.

10.1.1.194 ELPP_OS_UNIX

```
#define ELPP_OS_UNIX 0
```

Definition at line 127 of file easylogging++.h.

10.1.1.195 ELPP_OS_WINDOWS

```
#define ELPP_OS_WINDOWS 0
```

Definition at line 80 of file easylogging++.h.

10.1.1.196 ELPP_SIMPLE_LOG

```
#define ELPP_SIMPLE_LOG(
              LOG_TYPE )
```

Value:

```
MessageBuilder& operator«(LOG_TYPE msg) {\
m_logger->stream() « msg;\
if (ELPP->hasFlag(LoggingFlag::AutoSpacing)) {\
m_logger->stream() « " ";\
}\
return *this;\
}
```

Definition at line 2867 of file easylogging++.h.

10.1.1.197 ELPP_STACKTRACE

```
#define ELPP_STACKTRACE 0
```

Definition at line 220 of file easylogging++.h.

10.1.1.198 ELPP_STRLEN

```
#define ELPP_STRLEN strlen
```

Definition at line 522 of file easylogging++.h.

10.1.1.199 ELPP_THREADING_ENABLED

```
#define ELPP_THREADING_ENABLED 0
```

Definition at line 279 of file easylogging++.h.

10.1.1.200 ELPP_TRACE

```
#define ELPP_TRACE CLOG(TRACE, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4259 of file easylogging++.h.

10.1.1.201 ELPP_TRACE_LOG

```
#define ELPP_TRACE_LOG 1
```

Definition at line 334 of file easylogging++.h.

10.1.1.202 ELPP_UNUSED

```
#define ELPP_UNUSED(
              x ) (void)x
```

Definition at line 223 of file easylogging++.h.

10.1.1.203 ELPP_USE_DEF_CRASH_HANDLER

```
#define ELPP_USE_DEF_CRASH_HANDLER true
```

Definition at line 4535 of file easylogging++.h.

10.1.1.204 ELPP_USE_STD_THREADING

```
#define ELPP_USE_STD_THREADING 0
```

Definition at line 262 of file easylogging++.h.

10.1.1.205 ELPP_VARIADIC_TEMPLATES_SUPPORTED

```
#define ELPP_VARIADIC_TEMPLATES_SUPPORTED (ELPP_COMPILER_GCC || ELPP_COMPILER_CLANG || ELPP_COMPILER_INTEL
|| (ELPP_COMPILER_MSVC && _MSC_VER >= 1800))
```

Definition at line 300 of file easylogging++.h.

10.1.1.206 ELPP_VERBOSE_LOG

```
#define ELPP_VERBOSE_LOG 1
```

Definition at line 339 of file easylogging++.h.

10.1.1.207 ELPP_WARNING_LOG

```
#define ELPP_WARNING_LOG 1
```

Definition at line 319 of file easylogging++.h.

10.1.1.208 ELPP_WRITE_LOG

```
#define ELPP_WRITE_LOG(
              writer,
              level,
              dispatchAction,
              ...  ) writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(↩
__VA_ARGS__), __VA_ARGS__)
```

Definition at line 3395 of file easylogging++.h.

10.1.1.209 ELPP_WRITE_LOG_AFTER_N

```
#define ELPP_WRITE_LOG_AFTER_N(
              writer,
              n,
              level,
              dispatchAction,
              ...  )
```

Value:

```
ELPP->validateAfterNCounter(__FILE__, __LINE__, n) && \
writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
```

Definition at line 3402 of file easylogging++.h.

10.1.1.210 ELPP_WRITE_LOG_EVERY_N

```
#define ELPP_WRITE_LOG_EVERY_N(
                writer,
                occasion,
                level,
                dispatchAction,
                ...  )
```

Value:

```
ELPP->validateEveryNCounter(__FILE__, __LINE__, occasion) && \
writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
```

Definition at line 3399 of file easylogging++.h.

10.1.1.211 ELPP_WRITE_LOG_IF

```
#define ELPP_WRITE_LOG_IF(
                writer,
                condition,
                level,
                dispatchAction,
                ...  )
```

Value:

```
if (condition) \
writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
```

Definition at line 3397 of file easylogging++.h.

10.1.1.212 ELPP_WRITE_LOG_N_TIMES

```
#define ELPP_WRITE_LOG_N_TIMES(
                writer,
                n,
                level,
                dispatchAction,
                ...  )
```

Value:

```
ELPP->validateNTimesCounter(__FILE__, __LINE__, n) && \
writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
```

Definition at line 3405 of file easylogging++.h.

10.1.1.213 ELPP_WX_ENABLED

```
#define ELPP_WX_ENABLED(
                ContainerType )
```

Definition at line 3137 of file easylogging++.h.

10.1.1.214 ELPP_WX_HASH_MAP_ENABLED

```
#define ELPP_WX_HASH_MAP_ENABLED(
              ContainerType )
```

Definition at line 3138 of file easylogging++.h.

10.1.1.215 ELPP_WX_PTR_ENABLED

```
#define ELPP_WX_PTR_ENABLED(
              ContainerType )
```

Definition at line 3136 of file easylogging++.h.

10.1.1.216 elpptime

```
#define elpptime localtime
```

Definition at line 467 of file easylogging++.h.

10.1.1.217 elpptime_r

```
#define elpptime_r localtime_r
```

Definition at line 465 of file easylogging++.h.

10.1.1.218 elpptime_s

```
#define elpptime_s localtime_s
```

Definition at line 466 of file easylogging++.h.

10.1.1.219 INITIALIZE_EASYLOGGINGPP

```
#define INITIALIZE_EASYLOGGINGPP ELPP_INIT_EASYLOGGINGPP(new el::base::Storage(el::LogBuilderPtr(new
el::base::DefaultLogBuilder())))
```

Definition at line 4550 of file easylogging++.h.

10.1.1.220 INITIALIZE_NULL_EASYLOGGINGPP

```
#define INITIALIZE_NULL_EASYLOGGINGPP
```

Value:

```
namespace el {\
namespace base {\
el::base::type::StoragePointer elStorage;\
}\
el::base::debug::CrashHandler elCrashHandler(ELPP_USE_DEF_CRASH_HANDLER);\
}
```

Definition at line 4552 of file easylogging++.h.

10.1.1.221 LOG

```
#define LOG(
              LEVEL ) CLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4261 of file easylogging++.h.

10.1.1.222 LOG_AFTER_N

```
#define LOG_AFTER_N(
              n,
              LEVEL ) CLOG_AFTER_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4269 of file easylogging++.h.

10.1.1.223 LOG_EVERY_N

```
#define LOG_EVERY_N(
              n,
              LEVEL ) CLOG_EVERY_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4267 of file easylogging++.h.

10.1.1.224 LOG_IF

```
#define LOG_IF(
              condition,
              LEVEL ) CLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4264 of file easylogging++.h.

10.1.1.225 LOG_N_TIMES

```
#define LOG_N_TIMES(
              n,
              LEVEL ) CLOG_N_TIMES(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4271 of file easylogging++.h.

10.1.1.226 MAKE_CONTAINERELPP_FRIENDLY

```
#define MAKE_CONTAINERELPP_FRIENDLY(
              ContainerType,
              SizeMethod,
              ElementInstance )
```

Value:

```
el::base::type::ostream_t& operator«(el::base::type::ostream_t& ss, const ContainerType& container) {\
const el::base::type::char_t* sep = ELPP->hasFlag(el::LoggingFlag::NewLineForContainer) ? \
ELPP_LITERAL("\n    ") : ELPP_LITERAL(", ");\
ContainerType::const_iterator elem = container.begin();\
ContainerType::const_iterator endElem = container.end();\
std::size_t size_ = container.SizeMethod; \
ss « ELPP_LITERAL("[");\
for (std::size_t i = 0; elem != endElem && i < el::base::consts::kMaxLogPerContainer; ++i, ++elem) { \
ss « ElementInstance;\
ss « ((i < size_ - 1) ? sep : ELPP_LITERAL(""));\
}\
if (elem != endElem) {\
ss « ELPP_LITERAL("...");\
}\
ss « ELPP_LITERAL("]");\
return ss;\
}
```

Macro used internally that can be used externally to make containers easylogging++ friendly.

@detail This macro expands to write an ostream& operator<< for container. This container is expected to have begin() and end() methods that return respective iterators

Parameters

ContainerType	Type of container e.g, MyList from WX_DECLARE_LIST(int, MyList); in wxwidgets
SizeMethod	Method used to get size of container.
ElementInstance	Instance of element to be fed out. Instance name is "elem". See WXELPP_ENABLED macro for an example usage

Definition at line 3111 of file easylogging++.h.

10.1.1.227 MAKE_LOGGABLE

```
#define MAKE_LOGGABLE(
              ClassType,
              ClassInstance,
              OutputStreamInstance ) el::base::type::ostream_t& operator<<(el::base::type::ostream_t&
OutputStreamInstance, const ClassType& ClassInstance)
```

Definition at line 3630 of file easylogging++.h.

10.1.1.228 PCHECK

```
#define PCHECK(
              condition ) CPCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4450 of file easylogging++.h.

10.1.1.229 PERFORMANCE_CHECKPOINT

```
#define PERFORMANCE_CHECKPOINT(
              obj ) obj->checkpoint(std::string(), __FILE__, __LINE__, ELPP_FUNC)
```

Definition at line 3939 of file easylogging++.h.

10.1.1.230 PERFORMANCE_CHECKPOINT_WITH_ID

```
#define PERFORMANCE_CHECKPOINT_WITH_ID(
              obj,
              id ) obj->checkpoint(id, __FILE__, __LINE__, ELPP_FUNC)
```

Definition at line 3940 of file easylogging++.h.

10.1.1.231 PLOG

```
#define PLOG(
              LEVEL ) CPLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4290 of file easylogging++.h.

10.1.1.232 PLOG_IF

```
#define PLOG_IF(
              condition,
              LEVEL ) CPLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4291 of file easylogging++.h.

10.1.1.233 SHARE_EASYLOGGINGPP

```
#define SHARE_EASYLOGGINGPP(
              initializedStorage )
```

Value:

```
namespace el {\
namespace base {\
el::base::type::StoragePointer elStorage(initializedStorage);\
}\
el::base::debug::CrashHandler elCrashHandler(ELPP_USE_DEF_CRASH_HANDLER);\
}
```

Definition at line 4559 of file easylogging++.h.

10.1.1.234 START_EASYLOGGINGPP

```
#define START_EASYLOGGINGPP(
              argc,
              argv ) el::Helpers::setArgs(argc, argv)
```

Definition at line 4570 of file easylogging++.h.

10.1.1.235 STRCAT

```
#define STRCAT(
              a,
              b,
              len ) strcat(a, b)
```

Definition at line 250 of file easylogging++.h.

10.1.1.236 STRCPY

```
#define STRCPY(
              a,
              b,
              len ) strcpy(a, b)
```

Definition at line 251 of file easylogging++.h.

10.1.1.237 STRERROR

```
#define STRERROR(
              a,
              b,
              c ) strerror(c)
```

Definition at line 249 of file easylogging++.h.

10.1.1.238 STRTOK

```
#define STRTOK(
              a,
              b,
              c ) strtok(a, b)
```

Definition at line 248 of file easylogging++.h.

10.1.1.239 SYSLOG

```
#define SYSLOG(
              LEVEL ) el::base::NullWriter()
```

Definition at line 4348 of file easylogging++.h.

10.1.1.240 SYSLOG_AFTER_N

```
#define SYSLOG_AFTER_N(
              n,
              LEVEL ) el::base::NullWriter()
```

Definition at line 4351 of file easylogging++.h.

10.1.1.241 SYSLOG_EVERY_N

```
#define SYSLOG_EVERY_N(
              n,
              LEVEL ) el::base::NullWriter()
```

Definition at line 4350 of file easylogging++.h.

10.1.1.242 SYSLOG_IF

```
#define SYSLOG_IF(
              condition,
              LEVEL ) el::base::NullWriter()
```

Definition at line 4349 of file easylogging++.h.

10.1.1.243 SYSLOG_N_TIMES

```
#define SYSLOG_N_TIMES(
              n,
              LEVEL ) el::base::NullWriter()
```

Definition at line 4352 of file easylogging++.h.

10.1.1.244 TIMED_BLOCK

```
#define TIMED_BLOCK(
              obj,
              blockName )
```

Value:

```
  for (struct { int i; el::base::type::PerformanceTrackerPtr timer; } obj = { 0, \
  el::base::type::PerformanceTrackerPtr(new el::base::PerformanceTracker(blockName, ELPP_MIN_UNIT)) }; obj.i
      < 1; ++obj.i)
```

Definition at line 3927 of file easylogging++.h.

10.1.1.245 TIMED_FUNC

```
#define TIMED_FUNC(
              obj ) TIMED_SCOPE(obj, ELPP_FUNC)
```

Definition at line 3936 of file easylogging++.h.

10.1.1.246 TIMED_FUNC_IF

```
#define TIMED_FUNC_IF(
              obj,
              condition ) TIMED_SCOPE_IF(obj, ELPP_FUNC, condition)
```

Performance tracked function. Performance gets written when goes out of scope using 'performance' logger.

@detail Please note in order to check the performance at a certain time you can use obj->checkpoint();

See also

el::base::PerformanceTracker

el::base::PerformanceTracker::checkpoint

Definition at line 3935 of file easylogging++.h.

10.1.1.247 TIMED_SCOPE

```
#define TIMED_SCOPE(
              obj,
              blockname ) TIMED_SCOPE_IF(obj, blockname, true)
```

Definition at line 3926 of file easylogging++.h.

10.1.1.248 TIMED_SCOPE_IF

```
#define TIMED_SCOPE_IF(
              obj,
              blockname,
              condition )
```

Value:

```
el::base::type::PerformanceTrackerPtr obj( condition ? \
new el::base::PerformanceTracker(blockname, ELPP_MIN_UNIT) : nullptr )
```

Performance tracked scope. Performance gets written when goes out of scope using 'performance' logger.

@detail Please note in order to check the performance at a certain time you can use obj->checkpoint();

See also

el::base::PerformanceTracker

el::base::PerformanceTracker::checkpoint

Definition at line 3924 of file easylogging++.h.

10.1.1.249 VLOG

```
#define VLOG(
              vlevel ) CVLOG(vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4262 of file easylogging++.h.

10.1.1.250 VLOG_AFTER_N

```
#define VLOG_AFTER_N(
              n,
              vlevel ) CVLOG_AFTER_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4270 of file easylogging++.h.

10.1.1.251 VLOG_EVERY_N

```
#define VLOG_EVERY_N(
              n,
              vlevel ) CVLOG_EVERY_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4268 of file easylogging++.h.

10.1.1.252 VLOG_IF

```
#define VLOG_IF(
              condition,
              vlevel ) CVLOG_IF(condition, vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4265 of file easylogging++.h.

10.1.1.253 VLOG_IS_ON

```
#define VLOG_IS_ON(
              verboseLevel ) (ELPP->vRegistry()->allowed(verboseLevel, __FILE__))
```

Determines whether verbose logging is on for specified level current file.

Definition at line 3905 of file easylogging++.h.

10.1.1.254 VLOG_N_TIMES

```
#define VLOG_N_TIMES(
              n,
              vlevel ) CVLOG_N_TIMES(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
```

Definition at line 4272 of file easylogging++.h.

10.2 easylogging++.h

Go to the documentation of this file.

```
00001 //
00002 //  Bismillah ar-Rahmaan ar-Raheem
00003 //
00004 //  Easylogging++ v9.97.1
00005 //  Single-header only, cross-platform logging library for C++ applications
00006 //
00007 //  Copyright (c) 2012-present @abumq (Majid Q.)
00008 //
00009 //  This library is released under the MIT Licence.
00010 //  https://github.com/amrayn/easyloggingpp/blob/master/LICENSE
00011 //
00012
00013 #ifndef EASYLOGGINGPP_H
00014 #define EASYLOGGINGPP_H
00015 // Compilers and C++0x/C++11 Evaluation
00016 #if __cplusplus >= 201103L
00017 #  define ELPP_CXX11 1
00018 #endif  // __cplusplus >= 201103L
00019 #if (defined(__GNUC__))
00020 #  define ELPP_COMPILER_GCC 1
00021 #else
00022 #  define ELPP_COMPILER_GCC 0
00023 #endif
00024 #if ELPP_COMPILER_GCC
00025 #    define ELPP_GCC_VERSION (__GNUC__ * 10000 \
00026 + __GNUC_MINOR__ * 100 \
00027 + __GNUC_PATCHLEVEL__)
00028 #  if defined(__GXX_EXPERIMENTAL_CXX0X__)
00029 #    define ELPP_CXX0X 1
00030 #  endif
00031 #endif
00032 // Visual C++
00033 #if defined(_MSC_VER)
00034 #  define ELPP_COMPILER_MSVC 1
00035 #else
00036 #  define ELPP_COMPILER_MSVC 0
00037 #endif
00038 #define ELPP_CRT_DBG_WARNINGS ELPP_COMPILER_MSVC
00039 #if ELPP_COMPILER_MSVC
00040 #  if (_MSC_VER == 1600)
00041 #    define ELPP_CXX0X 1
00042 #  elif(_MSC_VER >= 1700)
00043 #    define ELPP_CXX11 1
00044 #  endif
00045 #endif
00046 // Clang++
00047 #if (defined(__clang__) && (__clang__ == 1))
00048 #  define ELPP_COMPILER_CLANG 1
00049 #else
00050 #  define ELPP_COMPILER_CLANG 0
00051 #endif
00052 #if ELPP_COMPILER_CLANG
00053 #  if __has_include(<thread>)
00054 #    include <cstddef> // Make __GLIBCXX__ defined when using libstdc++
00055 #    if !defined(__GLIBCXX__) || __GLIBCXX__ >= 20150426
00056 #      define ELPP_CLANG_SUPPORTS_THREAD
00057 #    endif // !defined(__GLIBCXX__) || __GLIBCXX__ >= 20150426
00058 #  endif // __has_include(<thread>)
00059 #endif
00060 #if (defined(__MINGW32__) || defined(__MINGW64__))
00061 #  define ELPP_MINGW 1
00062 #else
00063 #  define ELPP_MINGW 0
00064 #endif
00065 #if (defined(__CYGWIN__) && (__CYGWIN__ == 1))
00066 #  define ELPP_CYGWIN 1
00067 #else
00068 #  define ELPP_CYGWIN 0
00069 #endif
00070 #if (defined(__INTEL_COMPILER))
00071 #  define ELPP_COMPILER_INTEL 1
00072 #else
00073 #  define ELPP_COMPILER_INTEL 0
00074 #endif
00075 // Operating System Evaluation
00076 // Windows
00077 #if (defined(_WIN32) || defined(_WIN64))
00078 #  define ELPP_OS_WINDOWS 1
00079 #else
00080 #  define ELPP_OS_WINDOWS 0
00081 #endif
00082 // Linux
```

```
00083 #if (defined(__linux) || defined(__linux__))
00084 #  define ELPP_OS_LINUX 1
00085 #else
00086 #  define ELPP_OS_LINUX 0
00087 #endif
00088 #if (defined(__APPLE__))
00089 #  define ELPP_OS_MAC 1
00090 #else
00091 #  define ELPP_OS_MAC 0
00092 #endif
00093 #if (defined(__FreeBSD__) || defined(__FreeBSD_kernel__))
00094 #  define ELPP_OS_FREEBSD 1
00095 #else
00096 #  define ELPP_OS_FREEBSD 0
00097 #endif
00098 #if (defined(__sun))
00099 #  define ELPP_OS_SOLARIS 1
00100 #else
00101 #  define ELPP_OS_SOLARIS 0
00102 #endif
00103 #if (defined(_AIX))
00104 #  define ELPP_OS_AIX 1
00105 #else
00106 #  define ELPP_OS_AIX 0
00107 #endif
00108 #if (defined(__NetBSD__))
00109 #  define ELPP_OS_NETBSD 1
00110 #else
00111 #  define ELPP_OS_NETBSD 0
00112 #endif
00113 #if defined(__EMSCRIPTEN__)
00114 #  define ELPP_OS_EMSCRIPTEN 1
00115 #else
00116 #  define ELPP_OS_EMSCRIPTEN 0
00117 #endif
00118 #if (defined(__QNX__) || defined(__QNXNTO__))
00119 #  define ELPP_OS_QNX 1
00120 #else
00121 #  define ELPP_OS_QNX 0
00122 #endif
00123 // Unix
00124 #if ((ELPP_OS_LINUX || ELPP_OS_MAC || ELPP_OS_FREEBSD || ELPP_OS_NETBSD || ELPP_OS_SOLARIS ||
      ELPP_OS_AIX || ELPP_OS_EMSCRIPTEN || ELPP_OS_QNX) && (!ELPP_OS_WINDOWS))
00125 #  define ELPP_OS_UNIX 1
00126 #else
00127 #  define ELPP_OS_UNIX 0
00128 #endif
00129 #if (defined(__ANDROID__))
00130 #  define ELPP_OS_ANDROID 1
00131 #else
00132 #  define ELPP_OS_ANDROID 0
00133 #endif
00134 // Evaluating Cygwin as *nix OS
00135 #if !ELPP_OS_UNIX && !ELPP_OS_WINDOWS && ELPP_CYGWIN
00136 #  undef ELPP_OS_UNIX
00137 #  undef ELPP_OS_LINUX
00138 #  define ELPP_OS_UNIX 1
00139 #  define ELPP_OS_LINUX 1
00140 #endif //  !ELPP_OS_UNIX && !ELPP_OS_WINDOWS && ELPP_CYGWIN
00141 #if !defined(ELPP_INTERNAL_DEBUGGING_OUT_INFO)
00142 #  define ELPP_INTERNAL_DEBUGGING_OUT_INFO std::cout
00143 #endif // !defined(ELPP_INTERNAL_DEBUGGING_OUT)
00144 #if !defined(ELPP_INTERNAL_DEBUGGING_OUT_ERROR)
00145 #  define ELPP_INTERNAL_DEBUGGING_OUT_ERROR std::cerr
00146 #endif // !defined(ELPP_INTERNAL_DEBUGGING_OUT)
00147 #if !defined(ELPP_INTERNAL_DEBUGGING_ENDL)
00148 #  define ELPP_INTERNAL_DEBUGGING_ENDL std::endl
00149 #endif // !defined(ELPP_INTERNAL_DEBUGGING_OUT)
00150 #if !defined(ELPP_INTERNAL_DEBUGGING_MSG)
00151 #  define ELPP_INTERNAL_DEBUGGING_MSG(msg) msg
00152 #endif // !defined(ELPP_INTERNAL_DEBUGGING_OUT)
00153 // Internal Assertions and errors
00154 #if !defined(ELPP_DISABLE_ASSERT)
00155 #  if (defined(ELPP_DEBUG_ASSERT_FAILURE))
00156 #    define ELPP_ASSERT(expr, msg) if (!(expr)) { \
00157 std::stringstream internalInfoStream; internalInfoStream « msg; \
00158 ELPP_INTERNAL_DEBUGGING_OUT_ERROR \
00159 « "EASYLOGGING++ ASSERTION FAILED (LINE: " « __LINE__ « ") [" #expr « "] WITH MESSAGE \"" \
00160 « ELPP_INTERNAL_DEBUGGING_MSG(internalInfoStream.str()) « "\"" « ELPP_INTERNAL_DEBUGGING_ENDL;
      base::utils::abort(1, \
00161 "ELPP Assertion failure, please define ELPP_DEBUG_ASSERT_FAILURE"); }
00162 #  else
00163 #    define ELPP_ASSERT(expr, msg) if (!(expr)) { \
00164 std::stringstream internalInfoStream; internalInfoStream « msg; \
00165 ELPP_INTERNAL_DEBUGGING_OUT_ERROR\
00166 « "ASSERTION FAILURE FROM EASYLOGGING++ (LINE: " \
00167 « __LINE__ « ") [" #expr « "] WITH MESSAGE \"" « ELPP_INTERNAL_DEBUGGING_MSG(internalInfoStream.str())
```

```
      « "\"" \
00168 « ELPP_INTERNAL_DEBUGGING_ENDL; }
00169 #  endif  // (defined(ELPP_DEBUG_ASSERT_FAILURE))
00170 #else
00171 #  define ELPP_ASSERT(x, y)
00172 #endif  //(!defined(ELPP_DISABLE_ASSERT)
00173 #if ELPP_COMPILER_MSVC
00174 #  define ELPP_INTERNAL_DEBUGGING_WRITE_PERROR \
00175 { char buff[256]; strerror_s(buff, 256, errno); \
00176 ELPP_INTERNAL_DEBUGGING_OUT_ERROR « ": " « buff « " [" « errno « "]";} (void)0
00177 #else
00178 #  define ELPP_INTERNAL_DEBUGGING_WRITE_PERROR \
00179 ELPP_INTERNAL_DEBUGGING_OUT_ERROR « ": " « strerror(errno) « " [" « errno « "]"; (void)0
00180 #endif  // ELPP_COMPILER_MSVC
00181 #if defined(ELPP_DEBUG_ERRORS)
00182 #  if !defined(ELPP_INTERNAL_ERROR)
00183 #    define ELPP_INTERNAL_ERROR(msg, pe) { \
00184 std::stringstream internalInfoStream; internalInfoStream « "<ERROR> " « msg; \
00185 ELPP_INTERNAL_DEBUGGING_OUT_ERROR \
00186 « "ERROR FROM EASYLOGGING++ (LINE: " « __LINE__ « ") " \
00187 « ELPP_INTERNAL_DEBUGGING_MSG(internalInfoStream.str()) « ELPP_INTERNAL_DEBUGGING_ENDL; \
00188 if (pe) { ELPP_INTERNAL_DEBUGGING_OUT_ERROR « "    "; ELPP_INTERNAL_DEBUGGING_WRITE_PERROR; }} (void)0
00189 #  endif
00190 #else
00191 #  undef ELPP_INTERNAL_INFO
00192 #  define ELPP_INTERNAL_ERROR(msg, pe)
00193 #endif  // defined(ELPP_DEBUG_ERRORS)
00194 #if (defined(ELPP_DEBUG_INFO))
00195 #  if !(defined(ELPP_INTERNAL_INFO_LEVEL))
00196 #    define ELPP_INTERNAL_INFO_LEVEL 9
00197 #  endif  // !(defined(ELPP_INTERNAL_INFO_LEVEL))
00198 #  if !defined(ELPP_INTERNAL_INFO)
00199 #    define ELPP_INTERNAL_INFO(lvl, msg) { if (lvl <= ELPP_INTERNAL_INFO_LEVEL) { \
00200 std::stringstream internalInfoStream; internalInfoStream « "<INFO> " « msg; \
00201 ELPP_INTERNAL_DEBUGGING_OUT_INFO « ELPP_INTERNAL_DEBUGGING_MSG(internalInfoStream.str()) \
00202 « ELPP_INTERNAL_DEBUGGING_ENDL; }}
00203 #  endif
00204 #else
00205 #  undef ELPP_INTERNAL_INFO
00206 #  define ELPP_INTERNAL_INFO(lvl, msg)
00207 #endif  // (defined(ELPP_DEBUG_INFO))
00208 #if (defined(ELPP_FEATURE_ALL)) || (defined(ELPP_FEATURE_CRASH_LOG))
00209 #  if (ELPP_COMPILER_GCC && !ELPP_MINGW && !ELPP_CYGWIN && !ELPP_OS_ANDROID && !ELPP_OS_EMSCRIPTEN &&
      !ELPP_OS_QNX)
00210 #    define ELPP_STACKTRACE 1
00211 #  else
00212 #      if ELPP_COMPILER_MSVC
00213 #        pragma message("Stack trace not available for this compiler")
00214 #      else
00215 #        warning "Stack trace not available for this compiler";
00216 #      endif  // ELPP_COMPILER_MSVC
00217 #    define ELPP_STACKTRACE 0
00218 #  endif  // ELPP_COMPILER_GCC
00219 #else
00220 #    define ELPP_STACKTRACE 0
00221 #endif  // (defined(ELPP_FEATURE_ALL)) || (defined(ELPP_FEATURE_CRASH_LOG))
00222 // Miscellaneous macros
00223 #define ELPP_UNUSED(x) (void)x
00224 #if ELPP_OS_UNIX
00225 // Log file permissions for unix-based systems
00226 #  define ELPP_LOG_PERMS S_IRUSR | S_IWUSR | S_IXUSR | S_IWGRP | S_IRGRP | S_IXGRP | S_IWOTH | S_IXOTH
00227 #endif  // ELPP_OS_UNIX
00228 #if defined(ELPP_AS_DLL) && ELPP_COMPILER_MSVC
00229 #  if defined(ELPP_EXPORT_SYMBOLS)
00230 #    define ELPP_EXPORT __declspec(dllexport)
00231 #  else
00232 #    define ELPP_EXPORT __declspec(dllimport)
00233 #  endif  // defined(ELPP_EXPORT_SYMBOLS)
00234 #else
00235 #  define ELPP_EXPORT
00236 #endif  // defined(ELPP_AS_DLL) && ELPP_COMPILER_MSVC
00237 // Some special functions that are VC++ specific
00238 #undef STRTOK
00239 #undef STRERROR
00240 #undef STRCAT
00241 #undef STRCPY
00242 #if ELPP_CRT_DBG_WARNINGS
00243 #  define STRTOK(a, b, c) strtok_s(a, b, c)
00244 #  define STRERROR(a, b, c) strerror_s(a, b, c)
00245 #  define STRCAT(a, b, len) strcat_s(a, len, b)
00246 #  define STRCPY(a, b, len) strcpy_s(a, len, b)
00247 #else
00248 #  define STRTOK(a, b, c) strtok(a, b)
00249 #  define STRERROR(a, b, c) strerror(c)
00250 #  define STRCAT(a, b, len) strcat(a, b)
00251 #  define STRCPY(a, b, len) strcpy(a, b)
00252 #endif
```

```
00253 // Compiler specific support evaluations
00254 #if (ELPP_MINGW && !defined(ELPP_FORCE_USE_STD_THREAD))
00255 #  define ELPP_USE_STD_THREADING 0
00256 #else
00257 #  if ((ELPP_COMPILER_CLANG && defined(ELPP_CLANG_SUPPORTS_THREAD)) || \
00258        (!ELPP_COMPILER_CLANG && defined(ELPP_CXX11)) || \
00259        defined(ELPP_FORCE_USE_STD_THREAD))
00260 #    define ELPP_USE_STD_THREADING 1
00261 #  else
00262 #    define ELPP_USE_STD_THREADING 0
00263 #  endif
00264 #endif
00265 #undef ELPP_FINAL
00266 #if ELPP_COMPILER_INTEL || (ELPP_GCC_VERSION < 40702)
00267 #  define ELPP_FINAL
00268 #else
00269 #  define ELPP_FINAL final
00270 #endif  // ELPP_COMPILER_INTEL || (ELPP_GCC_VERSION < 40702)
00271 #if defined(ELPP_EXPERIMENTAL_ASYNC)
00272 #  define ELPP_ASYNC_LOGGING 1
00273 #else
00274 #  define ELPP_ASYNC_LOGGING 0
00275 #endif // defined(ELPP_EXPERIMENTAL_ASYNC)
00276 #if defined(ELPP_THREAD_SAFE) || ELPP_ASYNC_LOGGING
00277 #  define ELPP_THREADING_ENABLED 1
00278 #else
00279 #  define ELPP_THREADING_ENABLED 0
00280 #endif  // defined(ELPP_THREAD_SAFE) || ELPP_ASYNC_LOGGING
00281 // Function macro ELPP_FUNC
00282 #undef ELPP_FUNC
00283 #if ELPP_COMPILER_MSVC  // Visual C++
00284 #  define ELPP_FUNC __FUNCSIG__
00285 #elif ELPP_COMPILER_GCC  // GCC
00286 #  define ELPP_FUNC __PRETTY_FUNCTION__
00287 #elif ELPP_COMPILER_INTEL  // Intel C++
00288 #  define ELPP_FUNC __PRETTY_FUNCTION__
00289 #elif ELPP_COMPILER_CLANG  // Clang++
00290 #  define ELPP_FUNC __PRETTY_FUNCTION__
00291 #else
00292 #  if defined(__func__)
00293 #    define ELPP_FUNC __func__
00294 #  else
00295 #    define ELPP_FUNC ""
00296 #  endif  // defined(__func__)
00297 #endif  // defined(_MSC_VER)
00298 #undef ELPP_VARIADIC_TEMPLATES_SUPPORTED
00299 // Keep following line commented until features are fixed
00300 #define ELPP_VARIADIC_TEMPLATES_SUPPORTED \
00301 (ELPP_COMPILER_GCC || ELPP_COMPILER_CLANG || ELPP_COMPILER_INTEL || (ELPP_COMPILER_MSVC && _MSC_VER >=
      1800))
00302 // Logging Enable/Disable macros
00303 #if defined(ELPP_DISABLE_LOGS)
00304 #define ELPP_LOGGING_ENABLED 0
00305 #else
00306 #define ELPP_LOGGING_ENABLED 1
00307 #endif
00308 #if (!defined(ELPP_DISABLE_DEBUG_LOGS) && (ELPP_LOGGING_ENABLED))
00309 #  define ELPP_DEBUG_LOG 1
00310 #else
00311 #  define ELPP_DEBUG_LOG 0
00312 #endif  // (!defined(ELPP_DISABLE_DEBUG_LOGS) && (ELPP_LOGGING_ENABLED))
00313 #if (!defined(ELPP_DISABLE_INFO_LOGS) && (ELPP_LOGGING_ENABLED))
00314 #  define ELPP_INFO_LOG 1
00315 #else
00316 #  define ELPP_INFO_LOG 0
00317 #endif  // (!defined(ELPP_DISABLE_INFO_LOGS) && (ELPP_LOGGING_ENABLED))
00318 #if (!defined(ELPP_DISABLE_WARNING_LOGS) && (ELPP_LOGGING_ENABLED))
00319 #  define ELPP_WARNING_LOG 1
00320 #else
00321 #  define ELPP_WARNING_LOG 0
00322 #endif  // (!defined(ELPP_DISABLE_WARNING_LOGS) && (ELPP_LOGGING_ENABLED))
00323 #if (!defined(ELPP_DISABLE_ERROR_LOGS) && (ELPP_LOGGING_ENABLED))
00324 #  define ELPP_ERROR_LOG 1
00325 #else
00326 #  define ELPP_ERROR_LOG 0
00327 #endif  // (!defined(ELPP_DISABLE_ERROR_LOGS) && (ELPP_LOGGING_ENABLED))
00328 #if (!defined(ELPP_DISABLE_FATAL_LOGS) && (ELPP_LOGGING_ENABLED))
00329 #  define ELPP_FATAL_LOG 1
00330 #else
00331 #  define ELPP_FATAL_LOG 0
00332 #endif  // (!defined(ELPP_DISABLE_FATAL_LOGS) && (ELPP_LOGGING_ENABLED))
00333 #if (!defined(ELPP_DISABLE_TRACE_LOGS) && (ELPP_LOGGING_ENABLED))
00334 #  define ELPP_TRACE_LOG 1
00335 #else
00336 #  define ELPP_TRACE_LOG 0
00337 #endif  // (!defined(ELPP_DISABLE_TRACE_LOGS) && (ELPP_LOGGING_ENABLED))
00338 #if (!defined(ELPP_DISABLE_VERBOSE_LOGS) && (ELPP_LOGGING_ENABLED))
```

```
00339 #  define ELPP_VERBOSE_LOG 1
00340 #else
00341 #  define ELPP_VERBOSE_LOG 0
00342 #endif  // (!defined(ELPP_DISABLE_VERBOSE_LOGS) && (ELPP_LOGGING_ENABLED))
00343 #if (!(ELPP_CXX0X || ELPP_CXX11))
00344 #   error "C++0x (or higher) support not detected! (Is `-std=c++11' missing?)"
00345 #endif  // (!(ELPP_CXX0X || ELPP_CXX11))
00346 // Headers
00347 #if defined(ELPP_SYSLOG)
00348 #   include <syslog.h>
00349 #endif  // defined(ELPP_SYSLOG)
00350 #include <ctime>
00351 #include <cstring>
00352 #include <cstdlib>
00353 #include <cctype>
00354 #include <cwchar>
00355 #include <csignal>
00356 #include <cerrno>
00357 #include <cstdarg>
00358 #if defined(ELPP_UNICODE)
00359 #   include <locale>
00360 #  if ELPP_OS_WINDOWS
00361 #      include <codecvt>
00362 #  endif // ELPP_OS_WINDOWS
00363 #endif  // defined(ELPP_UNICODE)
00364 #ifdef HAVE_EXECINFO
00365 #   include <cxxabi.h>
00366 #   include <execinfo.h>
00367 #endif // ELPP_ENABLE_EXECINFO
00368 #if ELPP_OS_ANDROID
00369 #   include <sys/system_properties.h>
00370 #endif  // ELPP_OS_ANDROID
00371 #if ELPP_OS_UNIX
00372 #   include <sys/stat.h>
00373 #   include <sys/time.h>
00374 #elif ELPP_OS_WINDOWS
00375 #   include <direct.h>
00376 #   include <windows.h>
00377 #  if defined(WIN32_LEAN_AND_MEAN)
00378 #      if defined(ELPP_WINSOCK2)
00379 #         include <winsock2.h>
00380 #      else
00381 #         include <winsock.h>
00382 #      endif // defined(ELPP_WINSOCK2)
00383 #  endif // defined(WIN32_LEAN_AND_MEAN)
00384 #endif  // ELPP_OS_UNIX
00385 #include <string>
00386 #include <vector>
00387 #include <map>
00388 #include <unordered_map>
00389 #include <utility>
00390 #include <functional>
00391 #include <algorithm>
00392 #include <fstream>
00393 #include <iostream>
00394 #include <sstream>
00395 #include <memory>
00396 #include <type_traits>
00397 #if ELPP_THREADING_ENABLED
00398 #  if ELPP_USE_STD_THREADING
00399 #      include <mutex>
00400 #      include <thread>
00401 #  else
00402 #      if ELPP_OS_UNIX
00403 #         include <pthread.h>
00404 #      endif  // ELPP_OS_UNIX
00405 #  endif  // ELPP_USE_STD_THREADING
00406 #endif  // ELPP_THREADING_ENABLED
00407 #if ELPP_ASYNC_LOGGING
00408 #  if defined(ELPP_NO_SLEEP_FOR)
00409 #      include <unistd.h>
00410 #  endif  // defined(ELPP_NO_SLEEP_FOR)
00411 #   include <thread>
00412 #   include <queue>
00413 #   include <condition_variable>
00414 #endif  // ELPP_ASYNC_LOGGING
00415 #if defined(ELPP_STL_LOGGING)
00416 // For logging STL based templates
00417 #   include <list>
00418 #   include <queue>
00419 #   include <deque>
00420 #   include <set>
00421 #   include <bitset>
00422 #   include <stack>
00423 #  if defined(ELPP_LOG_STD_ARRAY)
00424 #      include <array>
00425 #  endif  // defined(ELPP_LOG_STD_ARRAY)
```

```
00426 #  if defined(ELPP_LOG_UNORDERED_SET)
00427 #      include <unordered_set>
00428 #  endif  // defined(ELPP_UNORDERED_SET)
00429 #endif  // defined(ELPP_STL_LOGGING)
00430 #if defined(ELPP_QT_LOGGING)
00431 // For logging Qt based classes & templates
00432 #   include <QString>
00433 #   include <QByteArray>
00434 #   include <QVector>
00435 #   include <QList>
00436 #   include <QPair>
00437 #   include <QMap>
00438 #   include <QQueue>
00439 #   include <QSet>
00440 #   include <QLinkedList>
00441 #   include <QHash>
00442 #   include <QMultiHash>
00443 #   include <QStack>
00444 #endif  // defined(ELPP_QT_LOGGING)
00445 #if defined(ELPP_BOOST_LOGGING)
00446 // For logging boost based classes & templates
00447 #   include <boost/container/vector.hpp>
00448 #   include <boost/container/stable_vector.hpp>
00449 #   include <boost/container/list.hpp>
00450 #   include <boost/container/deque.hpp>
00451 #   include <boost/container/map.hpp>
00452 #   include <boost/container/flat_map.hpp>
00453 #   include <boost/container/set.hpp>
00454 #   include <boost/container/flat_set.hpp>
00455 #endif  // defined(ELPP_BOOST_LOGGING)
00456 #if defined(ELPP_WXWIDGETS_LOGGING)
00457 // For logging wxWidgets based classes & templates
00458 #   include <wx/vector.h>
00459 #endif  // defined(ELPP_WXWIDGETS_LOGGING)
00460 #if defined(ELPP_UTC_DATETIME)
00461 #   define elpptime_r gmtime_r
00462 #   define elpptime_s gmtime_s
00463 #   define elpptime   gmtime
00464 #else
00465 #   define elpptime_r localtime_r
00466 #   define elpptime_s localtime_s
00467 #   define elpptime   localtime
00468 #endif  // defined(ELPP_UTC_DATETIME)
00469 // Forward declarations
00470 namespace el {
00471 class Logger;
00472 class LogMessage;
00473 class PerformanceTrackingData;
00474 class Loggers;
00475 class Helpers;
00476 template <typename T> class Callback;
00477 class LogDispatchCallback;
00478 class PerformanceTrackingCallback;
00479 class LoggerRegistrationCallback;
00480 class LogDispatchData;
00481 namespace base {
00482 class Storage;
00483 class RegisteredLoggers;
00484 class PerformanceTracker;
00485 class MessageBuilder;
00486 class Writer;
00487 class PErrorWriter;
00488 class LogDispatcher;
00489 class DefaultLogBuilder;
00490 class DefaultLogDispatchCallback;
00491 #if ELPP_ASYNC_LOGGING
00492 class AsyncLogDispatchCallback;
00493 class AsyncDispatchWorker;
00494 #endif // ELPP_ASYNC_LOGGING
00495 class DefaultPerformanceTrackingCallback;
00496 }  // namespace base
00497 }  // namespace el
00499 namespace el {
00501 namespace base {
00503 namespace type {
00504 #undef ELPP_LITERAL
00505 #undef ELPP_STRLEN
00506 #undef ELPP_COUT
00507 #if defined(ELPP_UNICODE)
00508 #  define ELPP_LITERAL(txt) L##txt
00509 #  define ELPP_STRLEN wcslen
00510 #  if defined ELPP_CUSTOM_COUT
00511 #    define ELPP_COUT ELPP_CUSTOM_COUT
00512 #  else
00513 #    define ELPP_COUT std::wcout
00514 #  endif  // defined ELPP_CUSTOM_COUT
00515 typedef wchar_t char_t;
```

```
00516 typedef std::wstring string_t;
00517 typedef std::wstringstream stringstream_t;
00518 typedef std::wfstream fstream_t;
00519 typedef std::wostream ostream_t;
00520 #else
00521 #  define ELPP_LITERAL(txt) txt
00522 #  define ELPP_STRLEN strlen
00523 #  if defined ELPP_CUSTOM_COUT
00524 #    define ELPP_COUT ELPP_CUSTOM_COUT
00525 #  else
00526 #    define ELPP_COUT std::cout
00527 #  endif  // defined ELPP_CUSTOM_COUT
00528 typedef char char_t;
00529 typedef std::string string_t;
00530 typedef std::stringstream stringstream_t;
00531 typedef std::fstream fstream_t;
00532 typedef std::ostream ostream_t;
00533 #endif  // defined(ELPP_UNICODE)
00534 #if defined(ELPP_CUSTOM_COUT_LINE)
00535 #  define ELPP_COUT_LINE(logLine) ELPP_CUSTOM_COUT_LINE(logLine)
00536 #else
00537 #  define ELPP_COUT_LINE(logLine) logLine << std::flush
00538 #endif // defined(ELPP_CUSTOM_COUT_LINE)
00539 typedef unsigned int EnumType;
00540 typedef unsigned short VerboseLevel;
00541 typedef unsigned long int LineNumber;
00542 typedef std::shared_ptr<base::Storage> StoragePointer;
00543 typedef std::shared_ptr<LogDispatchCallback> LogDispatchCallbackPtr;
00544 typedef std::shared_ptr<PerformanceTrackingCallback> PerformanceTrackingCallbackPtr;
00545 typedef std::shared_ptr<LoggerRegistrationCallback> LoggerRegistrationCallbackPtr;
00546 typedef std::unique_ptr<el::base::PerformanceTracker> PerformanceTrackerPtr;
00547 }  // namespace type
00551 class NoCopy {
00552  protected:
00553   NoCopy(void) {}
00554  private:
00555   NoCopy(const NoCopy&);
00556   NoCopy& operator=(const NoCopy&);
00557 };
00562 class StaticClass {
00563  private:
00564   StaticClass(void);
00565   StaticClass(const StaticClass&);
00566   StaticClass& operator=(const StaticClass&);
00567 };
00568 }  // namespace base
00573 enum class Level : base::type::EnumType {
00575   Global = 1,
00577   Trace = 2,
00579   Debug = 4,
00581   Fatal = 8,
00583   Error = 16,
00585   Warning = 32,
00587   Verbose = 64,
00589   Info = 128,
00591   Unknown = 1010
00592 };
00593 } // namespace el
00594 namespace std {
00595 template<> struct hash<el::Level> {
00596  public:
00597   std::size_t operator()(const el::Level& l) const {
00598     return hash<el::base::type::EnumType> {}(static_cast<el::base::type::EnumType>(l));
00599   }
00600 };
00601 }
00602 namespace el {
00604 class LevelHelper : base::StaticClass {
00605  public:
00607   static const base::type::EnumType kMinValid = static_cast<base::type::EnumType>(Level::Trace);
00609   static const base::type::EnumType kMaxValid = static_cast<base::type::EnumType>(Level::Info);
00611   static base::type::EnumType castToInt(Level level) {
00612     return static_cast<base::type::EnumType>(level);
00613   }
00615   static Level castFromInt(base::type::EnumType l) {
00616     return static_cast<Level>(l);
00617   }
00620   static const char* convertToString(Level level);
00624   static Level convertFromString(const char* levelStr);
00629   static void forEachLevel(base::type::EnumType* startIndex, const std::function<bool(void)>& fn);
00630 };
00633 enum class ConfigurationType : base::type::EnumType {
00636   Enabled = 1,
00638   ToFile = 2,
00641   ToStandardOutput = 4,
00643   Format = 8,
00645   Filename = 16,
```

```
00647   SubsecondPrecision = 32,
00649   MillisecondsWidth = SubsecondPrecision,
00653   PerformanceTracking = 64,
00658   MaxLogFileSize = 128,
00660   LogFlushThreshold = 256,
00662   Unknown = 1010
00663 };
00665 class ConfigurationTypeHelper : base::StaticClass {
00666  public:
00668   static const base::type::EnumType kMinValid =
      static_cast<base::type::EnumType>(ConfigurationType::Enabled);
00670   static const base::type::EnumType kMaxValid =
      static_cast<base::type::EnumType>(ConfigurationType::MaxLogFileSize);
00672   static base::type::EnumType castToInt(ConfigurationType configurationType) {
00673     return static_cast<base::type::EnumType>(configurationType);
00674   }
00676   static ConfigurationType castFromInt(base::type::EnumType c) {
00677     return static_cast<ConfigurationType>(c);
00678   }
00681   static const char* convertToString(ConfigurationType configurationType);
00685   static ConfigurationType convertFromString(const char* configStr);
00691   static inline void forEachConfigType(base::type::EnumType* startIndex, const
      std::function<bool(void)>& fn);
00692 };
00694 enum class LoggingFlag : base::type::EnumType {
00696   NewLineForContainer = 1,
00699   AllowVerboseIfModuleNotSpecified = 2,
00701   LogDetailedCrashReason = 4,
00703   DisableApplicationAbortOnFatalLog = 8,
00705   ImmediateFlush = 16,
00707   StrictLogFileSizeCheck = 32,
00709   ColoredTerminalOutput = 64,
00711   MultiLoggerSupport = 128,
00713   DisablePerformanceTrackingCheckpointComparison = 256,
00715   DisableVModules = 512,
00717   DisableVModulesExtensions = 1024,
00719   HierarchicalLogging = 2048,
00721   CreateLoggerAutomatically = 4096,
00723   AutoSpacing = 8192,
00725   FixedTimeFormat = 16384,
00726   // @brief Ignore SIGINT or crash
00727   IgnoreSigInt = 32768,
00728 };
00729 namespace base {
00731 namespace consts {
00732 static const char  kFormatSpecifierCharValue               =      'v';
00733 static const char  kFormatSpecifierChar                    =      '%';
00734 static const unsigned int kMaxLogPerCounter                =      100000;
00735 static const unsigned int kMaxLogPerContainer              =      100;
00736 static const unsigned int kDefaultSubsecondPrecision      =      3;
00737
00738 #ifdef ELPP_DEFAULT_LOGGER
00739 static const char* kDefaultLoggerId                        =      ELPP_DEFAULT_LOGGER;
00740 #else
00741 static const char* kDefaultLoggerId                        =      "default";
00742 #endif
00743
00744 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
00745 #ifdef ELPP_DEFAULT_PERFORMANCE_LOGGER
00746 static const char* kPerformanceLoggerId                    =      ELPP_DEFAULT_PERFORMANCE_LOGGER;
00747 #else
00748 static const char* kPerformanceLoggerId                    =      "performance";
00749 #endif // ELPP_DEFAULT_PERFORMANCE_LOGGER
00750 #endif
00751
00752 #if defined(ELPP_SYSLOG)
00753 static const char* kSysLogLoggerId                         =      "syslog";
00754 #endif  // defined(ELPP_SYSLOG)
00755
00756 #if ELPP_OS_WINDOWS
00757 static const char* kFilePathSeparator                      =      "\\";
00758 #else
00759 static const char* kFilePathSeparator                      =      "/";
00760 #endif  // ELPP_OS_WINDOWS
00761
00762 static const std::size_t kSourceFilenameMaxLength          =      100;
00763 static const std::size_t kSourceLineMaxLength              =      10;
00764 static const Level kPerformanceTrackerDefaultLevel         =      Level::Info;
00765 const struct {
00766   double value;
00767   const base::type::char_t* unit;
00768 } kTimeFormats[] = {
00769   { 1000.0f, ELPP_LITERAL("us") },
00770   { 1000.0f, ELPP_LITERAL("ms") },
00771   { 60.0f, ELPP_LITERAL("seconds") },
00772   { 60.0f, ELPP_LITERAL("minutes") },
00773   { 24.0f, ELPP_LITERAL("hours") },
```

```
00774   { 7.0f, ELPP_LITERAL("days") }
00775 };
00776 static const int kTimeFormatsCount                          =      sizeof(kTimeFormats) /
      sizeof(kTimeFormats[0]);
00777 const struct {
00778   int numb;
00779   const char* name;
00780   const char* brief;
00781   const char* detail;
00782 } kCrashSignals[] = {
00783   // NOTE: Do not re-order, if you do please check CrashHandler(bool) constructor and
      CrashHandler::setHandler(..)
00784   {
00785     SIGABRT, "SIGABRT", "Abnormal termination",
00786     "Program was abnormally terminated."
00787   },
00788   {
00789     SIGFPE, "SIGFPE", "Erroneous arithmetic operation",
00790     "Arithmetic operation issue such as division by zero or operation resulting in overflow."
00791   },
00792   {
00793     SIGILL, "SIGILL", "Illegal instruction",
00794     "Generally due to a corruption in the code or to an attempt to execute data."
00795   },
00796   {
00797     SIGSEGV, "SIGSEGV", "Invalid access to memory",
00798     "Program is trying to read an invalid (unallocated, deleted or corrupted) or inaccessible memory."
00799   },
00800   {
00801     SIGINT, "SIGINT", "Interactive attention signal",
00802     "Interruption generated (generally) by user or operating system."
00803   },
00804 };
00805 static const int kCrashSignalsCount                         =      sizeof(kCrashSignals) /
      sizeof(kCrashSignals[0]);
00806 }  // namespace consts
00807 }  // namespace base
00808 typedef std::function<void(const char*, std::size_t)> PreRollOutCallback;
00809 namespace base {
00810 static inline void defaultPreRollOutCallback(const char*, std::size_t) {}
00812 enum class TimestampUnit : base::type::EnumType {
00813   Microsecond = 0, Millisecond = 1, Second = 2, Minute = 3, Hour = 4, Day = 5
00814 };
00816 enum class FormatFlags : base::type::EnumType {
00817   DateTime = 1 « 1,
00818   LoggerId = 1 « 2,
00819   File = 1 « 3,
00820   Line = 1 « 4,
00821   Location = 1 « 5,
00822   Function = 1 « 6,
00823   User = 1 « 7,
00824   Host = 1 « 8,
00825   LogMessage = 1 « 9,
00826   VerboseLevel = 1 « 10,
00827   AppName = 1 « 11,
00828   ThreadId = 1 « 12,
00829   Level = 1 « 13,
00830   FileBase = 1 « 14,
00831   LevelShort = 1 « 15
00832 };
00834 class SubsecondPrecision {
00835  public:
00836   SubsecondPrecision(void) {
00837     init(base::consts::kDefaultSubsecondPrecision);
00838   }
00839   explicit SubsecondPrecision(int width) {
00840     init(width);
00841   }
00842   bool operator==(const SubsecondPrecision& ssPrec) {
00843     return m_width == ssPrec.m_width && m_offset == ssPrec.m_offset;
00844   }
00845   int m_width;
00846   unsigned int m_offset;
00847  private:
00848   void init(int width);
00849 };
00851 typedef SubsecondPrecision MillisecondsWidth;
00853 namespace utils {
00855 template <typename T>
00856 static
00857 typename std::enable_if<std::is_pointer<T*>::value, void>::type
00858 safeDelete(T*& pointer) {
00859   if (pointer == nullptr)
00860     return;
00861   delete pointer;
00862   pointer = nullptr;
00863 }
```

```
00866 namespace bitwise {
00867 template <typename Enum>
00868 static inline base::type::EnumType And(Enum e, base::type::EnumType flag) {
00869   return static_cast<base::type::EnumType>(flag) & static_cast<base::type::EnumType>(e);
00870 }
00871 template <typename Enum>
00872 static inline base::type::EnumType Not(Enum e, base::type::EnumType flag) {
00873   return static_cast<base::type::EnumType>(flag) & ~(static_cast<base::type::EnumType>(e));
00874 }
00875 template <typename Enum>
00876 static inline base::type::EnumType Or(Enum e, base::type::EnumType flag) {
00877   return static_cast<base::type::EnumType>(flag) | static_cast<base::type::EnumType>(e);
00878 }
00879 }  // namespace bitwise
00880 template <typename Enum>
00881 static inline void addFlag(Enum e, base::type::EnumType* flag) {
00882   *flag = base::utils::bitwise::Or<Enum>(e, *flag);
00883 }
00884 template <typename Enum>
00885 static inline void removeFlag(Enum e, base::type::EnumType* flag) {
00886   *flag = base::utils::bitwise::Not<Enum>(e, *flag);
00887 }
00888 template <typename Enum>
00889 static inline bool hasFlag(Enum e, base::type::EnumType flag) {
00890   return base::utils::bitwise::And<Enum>(e, flag) > 0x0;
00891 }
00892 }  // namespace utils
00893 namespace threading {
00894 #if ELPP_THREADING_ENABLED
00895 #  if !ELPP_USE_STD_THREADING
00896 namespace internal {
00898 class Mutex : base::NoCopy {
00899  public:
00900   Mutex(void) {
00901 #  if ELPP_OS_UNIX
00902     pthread_mutexattr_t attr;
00903     pthread_mutexattr_init(&attr);
00904     pthread_mutexattr_settype(&attr, PTHREAD_MUTEX_RECURSIVE);
00905     pthread_mutex_init(&m_underlyingMutex, &attr);
00906     pthread_mutexattr_destroy(&attr);
00907 #  elif ELPP_OS_WINDOWS
00908     InitializeCriticalSection(&m_underlyingMutex);
00909 #  endif  // ELPP_OS_UNIX
00910   }
00911
00912   virtual ~Mutex(void) {
00913 #  if ELPP_OS_UNIX
00914     pthread_mutex_destroy(&m_underlyingMutex);
00915 #  elif ELPP_OS_WINDOWS
00916     DeleteCriticalSection(&m_underlyingMutex);
00917 #  endif  // ELPP_OS_UNIX
00918   }
00919
00920   inline void lock(void) {
00921 #  if ELPP_OS_UNIX
00922     pthread_mutex_lock(&m_underlyingMutex);
00923 #  elif ELPP_OS_WINDOWS
00924     EnterCriticalSection(&m_underlyingMutex);
00925 #  endif  // ELPP_OS_UNIX
00926   }
00927
00928   inline bool try_lock(void) {
00929 #  if ELPP_OS_UNIX
00930     return (pthread_mutex_trylock(&m_underlyingMutex) == 0);
00931 #  elif ELPP_OS_WINDOWS
00932     return TryEnterCriticalSection(&m_underlyingMutex);
00933 #  endif  // ELPP_OS_UNIX
00934   }
00935
00936   inline void unlock(void) {
00937 #  if ELPP_OS_UNIX
00938     pthread_mutex_unlock(&m_underlyingMutex);
00939 #  elif ELPP_OS_WINDOWS
00940     LeaveCriticalSection(&m_underlyingMutex);
00941 #  endif  // ELPP_OS_UNIX
00942   }
00943
00944  private:
00945 #  if ELPP_OS_UNIX
00946   pthread_mutex_t m_underlyingMutex;
00947 #  elif ELPP_OS_WINDOWS
00948   CRITICAL_SECTION m_underlyingMutex;
00949 #  endif  // ELPP_OS_UNIX
00950 };
00952 template <typename M>
00953 class ScopedLock : base::NoCopy {
00954  public:
```

```
00955   explicit ScopedLock(M& mutex) {
00956     m_mutex = &mutex;
00957     m_mutex->lock();
00958   }
00959
00960   virtual ~ScopedLock(void) {
00961     m_mutex->unlock();
00962   }
00963  private:
00964   M* m_mutex;
00965   ScopedLock(void);
00966 };
00967 } // namespace internal
00968 typedef base::threading::internal::Mutex Mutex;
00969 typedef base::threading::internal::ScopedLock<base::threading::Mutex> ScopedLock;
00970 #  else
00971 typedef std::recursive_mutex Mutex;
00972 typedef std::lock_guard<base::threading::Mutex> ScopedLock;
00973 #  endif  // !ELPP_USE_STD_THREADING
00974 #else
00975 namespace internal {
00977 class NoMutex : base::NoCopy {
00978  public:
00979   NoMutex(void) {}
00980   inline void lock(void) {}
00981   inline bool try_lock(void) {
00982     return true;
00983   }
00984   inline void unlock(void) {}
00985 };
00987 template <typename Mutex>
00988 class NoScopedLock : base::NoCopy {
00989  public:
00990   explicit NoScopedLock(Mutex&) {
00991   }
00992   virtual ~NoScopedLock(void) {
00993   }
00994  private:
00995   NoScopedLock(void);
00996 };
00997 }  // namespace internal
00998 typedef base::threading::internal::NoMutex Mutex;
00999 typedef base::threading::internal::NoScopedLock<base::threading::Mutex> ScopedLock;
01000 #endif  // ELPP_THREADING_ENABLED
01002 class ThreadSafe {
01003  public:
01004   virtual inline void acquireLock(void) ELPP_FINAL { m_mutex.lock(); }
01005   virtual inline void releaseLock(void) ELPP_FINAL { m_mutex.unlock(); }
01006   virtual inline base::threading::Mutex& lock(void) ELPP_FINAL { return m_mutex; }
01007  protected:
01008   ThreadSafe(void) {}
01009   virtual ~ThreadSafe(void) {}
01010  private:
01011   base::threading::Mutex m_mutex;
01012 };
01013
01014 #if ELPP_THREADING_ENABLED
01015 #  if !ELPP_USE_STD_THREADING
01017 static std::string getCurrentThreadId(void) {
01018   std::stringstream ss;
01019 #      if (ELPP_OS_WINDOWS)
01020   ss << GetCurrentThreadId();
01021 #      endif  // (ELPP_OS_WINDOWS)
01022   return ss.str();
01023 }
01024 #  else
01026 static std::string getCurrentThreadId(void) {
01027   std::stringstream ss;
01028   ss << std::this_thread::get_id();
01029   return ss.str();
01030 }
01031 #  endif  // !ELPP_USE_STD_THREADING
01032 #else
01033 static inline std::string getCurrentThreadId(void) {
01034   return std::string();
01035 }
01036 #endif  // ELPP_THREADING_ENABLED
01037 }  // namespace threading
01038 namespace utils {
01039 class File : base::StaticClass {
01040  public:
01043   static base::type::fstream_t* newFileStream(const std::string& filename);
01044
01046   static std::size_t getSizeOfFile(base::type::fstream_t* fs);
01047
01049   static bool pathExists(const char* path, bool considerFile = false);
01050
```

```
01053   static bool createPath(const std::string& path);
01055   static std::string extractPathFromFilename(const std::string& fullPath,
01056       const char* separator = base::consts::kFilePathSeparator);
01058   static void buildStrippedFilename(const char* filename, char buff[],
01059                                     std::size_t limit = base::consts::kSourceFilenameMaxLength);
01061   static void buildBaseFilename(const std::string& fullPath, char buff[],
01062                                 std::size_t limit = base::consts::kSourceFilenameMaxLength,
01063                                 const char* separator = base::consts::kFilePathSeparator);
01064 };
01066 class Str : base::StaticClass {
01067  public:
01069   static inline bool isDigit(char c) {
01070     return c >= '0' && c <= '9';
01071   }
01072
01074   static bool wildCardMatch(const char* str, const char* pattern);
01075
01076   static std::string& ltrim(std::string& str);
01077   static std::string& rtrim(std::string& str);
01078   static std::string& trim(std::string& str);
01079
01084   static bool startsWith(const std::string& str, const std::string& start);
01085
01090   static bool endsWith(const std::string& str, const std::string& end);
01091
01097   static std::string& replaceAll(std::string& str, char replaceWhat, char replaceWith);
01098
01104   static std::string& replaceAll(std::string& str, const std::string& replaceWhat,
01105                                  const std::string& replaceWith);
01106
01107   static void replaceFirstWithEscape(base::type::string_t& str, const base::type::string_t&
      replaceWhat,
01108                                      const base::type::string_t& replaceWith);
01109 #if defined(ELPP_UNICODE)
01110   static void replaceFirstWithEscape(base::type::string_t& str, const base::type::string_t&
      replaceWhat,
01111                                      const std::string& replaceWith);
01112 #endif  // defined(ELPP_UNICODE)
01116   static std::string& toUpper(std::string& str);
01117
01119   static bool cStringEq(const char* s1, const char* s2);
01120
01123   static bool cStringCaseEq(const char* s1, const char* s2);
01124
01126   static bool contains(const char* str, char c);
01127
01128   static char* convertAndAddToBuff(std::size_t n, int len, char* buf, const char* bufLim, bool
      zeroPadded = true);
01129   static char* addToBuff(const char* str, char* buf, const char* bufLim);
01130   static char* clearBuff(char buff[], std::size_t lim);
01131
01134   static char* wcharPtrToCharPtr(const wchar_t* line);
01135 };
01137 class OS : base::StaticClass {
01138  public:
01139 #if ELPP_OS_WINDOWS
01144   static const char* getWindowsEnvironmentVariable(const char* varname);
01145 #endif  // ELPP_OS_WINDOWS
01146 #if ELPP_OS_ANDROID
01148   static std::string getProperty(const char* prop);
01149
01151   static std::string getDeviceName(void);
01152 #endif  // ELPP_OS_ANDROID
01153
01159   static const std::string getBashOutput(const char* command);
01160
01166   static std::string getEnvironmentVariable(const char* variableName, const char* defaultVal,
01167       const char* alternativeBashCommand = nullptr);
01169   static std::string currentUser(void);
01170
01174   static std::string currentHost(void);
01176   static bool termSupportsColor(void);
01177 };
01179 class DateTime : base::StaticClass {
01180  public:
01185   static void gettimeofday(struct timeval* tv);
01186
01191   static std::string getDateTime(const char* format, const base::SubsecondPrecision* ssPrec);
01192
01194   static std::string timevalToString(struct timeval tval, const char* format,
01195                                      const el::base::SubsecondPrecision* ssPrec);
01196
01198   static base::type::string_t formatTime(unsigned long long time, base::TimestampUnit timestampUnit);
01199
01201   static unsigned long long getTimeDifference(const struct timeval& endTime, const struct timeval&
      startTime,
01202       base::TimestampUnit timestampUnit);
```

```
01203
01204
01205   static struct ::tm* buildTimeInfo(struct timeval* currTime, struct ::tm* timeInfo);
01206  private:
01207   static char* parseFormat(char* buf, std::size_t bufSz, const char* format, const struct tm* tInfo,
01208                            std::size_t msec, const base::SubsecondPrecision* ssPrec);
01209 };
01211 class CommandLineArgs {
01212  public:
01213   CommandLineArgs(void) {
01214     setArgs(0, static_cast<char**>(nullptr));
01215   }
01216   CommandLineArgs(int argc, const char** argv) {
01217     setArgs(argc, argv);
01218   }
01219   CommandLineArgs(int argc, char** argv) {
01220     setArgs(argc, argv);
01221   }
01222   virtual ~CommandLineArgs(void) {}
01224   inline void setArgs(int argc, const char** argv) {
01225     setArgs(argc, const_cast<char**>(argv));
01226   }
01228   void setArgs(int argc, char** argv);
01230   bool hasParamWithValue(const char* paramKey) const;
01233   const char* getParamValue(const char* paramKey) const;
01235   bool hasParam(const char* paramKey) const;
01237   bool empty(void) const;
01239   std::size_t size(void) const;
01240   friend base::type::ostream_t& operator<<(base::type::ostream_t& os, const CommandLineArgs& c);
01241
01242  private:
01243   int m_argc;
01244   char** m_argv;
01245   std::unordered_map<std::string, std::string> m_paramsWithValue;
01246   std::vector<std::string> m_params;
01247 };
01254 template <typename T_Ptr, typename Container>
01255 class AbstractRegistry : public base::threading::ThreadSafe {
01256  public:
01257   typedef typename Container::iterator iterator;
01258   typedef typename Container::const_iterator const_iterator;
01259
01261   AbstractRegistry(void) {}
01262
01264   AbstractRegistry(AbstractRegistry&& sr) {
01265     if (this == &sr) {
01266       return;
01267     }
01268     unregisterAll();
01269     m_list = std::move(sr.m_list);
01270   }
01271
01272   bool operator==(const AbstractRegistry<T_Ptr, Container>& other) {
01273     if (size() != other.size()) {
01274       return false;
01275     }
01276     for (std::size_t i = 0; i < m_list.size(); ++i) {
01277       if (m_list.at(i) != other.m_list.at(i)) {
01278         return false;
01279       }
01280     }
01281     return true;
01282   }
01283
01284   bool operator!=(const AbstractRegistry<T_Ptr, Container>& other) {
01285     if (size() != other.size()) {
01286       return true;
01287     }
01288     for (std::size_t i = 0; i < m_list.size(); ++i) {
01289       if (m_list.at(i) != other.m_list.at(i)) {
01290         return true;
01291       }
01292     }
01293     return false;
01294   }
01295
01297   AbstractRegistry& operator=(AbstractRegistry&& sr) {
01298     if (this == &sr) {
01299       return *this;
01300     }
01301     unregisterAll();
01302     m_list = std::move(sr.m_list);
01303     return *this;
01304   }
01305
01306   virtual ~AbstractRegistry(void) {
01307   }
```

```
01308
01310   virtual inline iterator begin(void) ELPP_FINAL {
01311     return m_list.begin();
01312   }
01313
01315   virtual inline iterator end(void) ELPP_FINAL {
01316     return m_list.end();
01317   }
01318
01319
01321   virtual inline const_iterator cbegin(void) const ELPP_FINAL {
01322     return m_list.cbegin();
01323   }
01324
01326   virtual inline const_iterator cend(void) const ELPP_FINAL {
01327     return m_list.cend();
01328   }
01329
01331   virtual inline bool empty(void) const ELPP_FINAL {
01332     return m_list.empty();
01333   }
01334
01336   virtual inline std::size_t size(void) const ELPP_FINAL {
01337     return m_list.size();
01338   }
01339
01341   virtual inline Container& list(void) ELPP_FINAL {
01342     return m_list;
01343   }
01344
01346   virtual inline const Container& list(void) const ELPP_FINAL {
01347     return m_list;
01348   }
01349
01351   virtual void unregisterAll(void) = 0;
01352
01353  protected:
01354   virtual void deepCopy(const AbstractRegistry<T_Ptr, Container>&) = 0;
01355   void reinitDeepCopy(const AbstractRegistry<T_Ptr, Container>& sr) {
01356     unregisterAll();
01357     deepCopy(sr);
01358   }
01359
01360  private:
01361   Container m_list;
01362 };
01363
01369 template <typename T_Ptr, typename T_Key = const char*>
01370 class Registry : public AbstractRegistry<T_Ptr, std::unordered_map<T_Key, T_Ptr*>> {
01371  public:
01372   typedef typename Registry<T_Ptr, T_Key>::iterator iterator;
01373   typedef typename Registry<T_Ptr, T_Key>::const_iterator const_iterator;
01374
01375   Registry(void) {}
01376
01378   Registry(const Registry& sr) : AbstractRegistry<T_Ptr, std::vector<T_Ptr*>>() {
01379     if (this == &sr) {
01380       return;
01381     }
01382     this->reinitDeepCopy(sr);
01383   }
01384
01388   Registry& operator=(const Registry& sr) {
01389     if (this == &sr) {
01390       return *this;
01391     }
01392     this->reinitDeepCopy(sr);
01393     return *this;
01394   }
01395
01396   virtual ~Registry(void) {
01397     unregisterAll();
01398   }
01399
01400  protected:
01401   virtual void unregisterAll(void) ELPP_FINAL {
01402     if (!this->empty()) {
01403       for (auto&& curr : this->list()) {
01404         base::utils::safeDelete(curr.second);
01405       }
01406       this->list().clear();
01407     }
01408   }
01409
01411   virtual void registerNew(const T_Key& uniqKey, T_Ptr* ptr) ELPP_FINAL {
01412     unregister(uniqKey);
01413     this->list().insert(std::make_pair(uniqKey, ptr));
```

```
01414   }
01415
01417   void unregister(const T_Key& uniqKey) {
01418     T_Ptr* existing = get(uniqKey);
01419     if (existing != nullptr) {
01420       this->list().erase(uniqKey);
01421       base::utils::safeDelete(existing);
01422     }
01423   }
01424
01426   T_Ptr* get(const T_Key& uniqKey) {
01427     iterator it = this->list().find(uniqKey);
01428     return it == this->list().end()
01429            ? nullptr
01430            : it->second;
01431   }
01432
01433  private:
01434   virtual void deepCopy(const AbstractRegistry<T_Ptr, std::unordered_map<T_Key, T_Ptr*>& sr)
      ELPP_FINAL {
01435     for (const_iterator it = sr.cbegin(); it != sr.cend(); ++it) {
01436       registerNew(it->first, new T_Ptr(*it->second));
01437     }
01438   }
01439 };
01440
01445 template <typename T_Ptr, typename Pred>
01446 class RegistryWithPred : public AbstractRegistry<T_Ptr, std::vector<T_Ptr*>> {
01447  public:
01448   typedef typename RegistryWithPred<T_Ptr, Pred>::iterator iterator;
01449   typedef typename RegistryWithPred<T_Ptr, Pred>::const_iterator const_iterator;
01450
01451   RegistryWithPred(void) {
01452   }
01453
01454   virtual ~RegistryWithPred(void) {
01455     unregisterAll();
01456   }
01457
01459   RegistryWithPred(const RegistryWithPred& sr) : AbstractRegistry<T_Ptr, std::vector<T_Ptr*>>() {
01460     if (this == &sr) {
01461       return;
01462     }
01463     this->reinitDeepCopy(sr);
01464   }
01465
01469   RegistryWithPred& operator=(const RegistryWithPred& sr) {
01470     if (this == &sr) {
01471       return *this;
01472     }
01473     this->reinitDeepCopy(sr);
01474     return *this;
01475   }
01476
01477   friend base::type::ostream_t& operator<<(base::type::ostream_t& os, const RegistryWithPred& sr) {
01478     for (const_iterator it = sr.list().begin(); it != sr.list().end(); ++it) {
01479       os << ELPP_LITERAL("    ") << **it << ELPP_LITERAL("\n");
01480     }
01481     return os;
01482   }
01483
01484  protected:
01485   virtual void unregisterAll(void) ELPP_FINAL {
01486     if (!this->empty()) {
01487       for (auto&& curr : this->list()) {
01488         base::utils::safeDelete(curr);
01489       }
01490       this->list().clear();
01491     }
01492   }
01493
01494   virtual void unregister(T_Ptr*& ptr) ELPP_FINAL {
01495     if (ptr) {
01496       iterator iter = this->begin();
01497       for (; iter != this->end(); ++iter) {
01498         if (ptr == *iter) {
01499           break;
01500         }
01501       }
01502       if (iter != this->end() && *iter != nullptr) {
01503         this->list().erase(iter);
01504         base::utils::safeDelete(*iter);
01505       }
01506     }
01507   }
01508
01509   virtual inline void registerNew(T_Ptr* ptr) ELPP_FINAL {
```

```
01510     this->list().push_back(ptr);
01511   }
01512
01515   template <typename T, typename T2>
01516   T_Ptr* get(const T& arg1, const T2 arg2) {
01517     iterator iter = std::find_if(this->list().begin(), this->list().end(), Pred(arg1, arg2));
01518     if (iter != this->list().end() && *iter != nullptr) {
01519       return *iter;
01520     }
01521     return nullptr;
01522   }
01523
01524  private:
01525   virtual void deepCopy(const AbstractRegistry<T_Ptr, std::vector<T_Ptr*>>& sr) {
01526     for (const_iterator it = sr.list().begin(); it != sr.list().end(); ++it) {
01527       registerNew(new T_Ptr(**it));
01528     }
01529   }
01530 };
01531 class Utils {
01532  public:
01533   template <typename T, typename TPtr>
01534   static bool installCallback(const std::string& id, std::unordered_map<std::string, TPtr>* mapT) {
01535     if (mapT->find(id) == mapT->end()) {
01536       mapT->insert(std::make_pair(id, TPtr(new T())));
01537       return true;
01538     }
01539     return false;
01540   }
01541
01542   template <typename T, typename TPtr>
01543   static void uninstallCallback(const std::string& id, std::unordered_map<std::string, TPtr>* mapT) {
01544     if (mapT->find(id) != mapT->end()) {
01545       mapT->erase(id);
01546     }
01547   }
01548
01549   template <typename T, typename TPtr>
01550   static T* callback(const std::string& id, std::unordered_map<std::string, TPtr>* mapT) {
01551     typename std::unordered_map<std::string, TPtr>::iterator iter = mapT->find(id);
01552     if (iter != mapT->end()) {
01553       return static_cast<T*>(iter->second.get());
01554     }
01555     return nullptr;
01556   }
01557 };
01558 }  // namespace utils
01559 } // namespace base
01563 class Loggable {
01564  public:
01565   virtual ~Loggable(void) {}
01566   virtual void log(el::base::type::ostream_t&) const = 0;
01567  private:
01568   friend inline el::base::type::ostream_t& operator<<(el::base::type::ostream_t& os, const Loggable&
      loggable) {
01569     loggable.log(os);
01570     return os;
01571   }
01572 };
01573 namespace base {
01575 class LogFormat : public Loggable {
01576  public:
01577   LogFormat(void);
01578   LogFormat(Level level, const base::type::string_t& format);
01579   LogFormat(const LogFormat& logFormat);
01580   LogFormat(LogFormat&& logFormat);
01581   LogFormat& operator=(const LogFormat& logFormat);
01582   virtual ~LogFormat(void) {}
01583   bool operator==(const LogFormat& other);
01584
01587   void parseFromFormat(const base::type::string_t& userFormat);
01588
01589   inline Level level(void) const {
01590     return m_level;
01591   }
01592
01593   inline const base::type::string_t& userFormat(void) const {
01594     return m_userFormat;
01595   }
01596
01597   inline const base::type::string_t& format(void) const {
01598     return m_format;
01599   }
01600
01601   inline const std::string& dateTimeFormat(void) const {
01602     return m_dateTimeFormat;
01603   }
```

```
01604
01605   inline base::type::EnumType flags(void) const {
01606     return m_flags;
01607   }
01608
01609   inline bool hasFlag(base::FormatFlags flag) const {
01610     return base::utils::hasFlag(flag, m_flags);
01611   }
01612
01613   virtual void log(el::base::type::ostream_t& os) const {
01614     os << m_format;
01615   }
01616
01617  protected:
01621   virtual void updateDateFormat(std::size_t index, base::type::string_t& currFormat) ELPP_FINAL;
01622
01624   virtual void updateFormatSpec(void) ELPP_FINAL;
01625
01626   inline void addFlag(base::FormatFlags flag) {
01627     base::utils::addFlag(flag, &m_flags);
01628   }
01629
01630  private:
01631   Level m_level;
01632   base::type::string_t m_userFormat;
01633   base::type::string_t m_format;
01634   std::string m_dateTimeFormat;
01635   base::type::EnumType m_flags;
01636   std::string m_currentUser;
01637   std::string m_currentHost;
01638   friend class el::Logger;  // To resolve loggerId format specifier easily
01639 };
01640 }  // namespace base
01642 typedef std::function<std::string(const LogMessage*)> FormatSpecifierValueResolver;
01646 class CustomFormatSpecifier {
01647  public:
01648   CustomFormatSpecifier(const char* formatSpecifier, const FormatSpecifierValueResolver& resolver) :
01649     m_formatSpecifier(formatSpecifier), m_resolver(resolver) {}
01650   inline const char* formatSpecifier(void) const {
01651     return m_formatSpecifier;
01652   }
01653   inline const FormatSpecifierValueResolver& resolver(void) const {
01654     return m_resolver;
01655   }
01656   inline bool operator==(const char* formatSpecifier) {
01657     return strcmp(m_formatSpecifier, formatSpecifier) == 0;
01658   }
01659
01660  private:
01661   const char* m_formatSpecifier;
01662   FormatSpecifierValueResolver m_resolver;
01663 };
01673 class Configuration : public Loggable {
01674  public:
01675   Configuration(const Configuration& c);
01676   Configuration& operator=(const Configuration& c);
01677
01678   virtual ~Configuration(void) {
01679   }
01680
01682   Configuration(Level level, ConfigurationType configurationType, const std::string& value);
01683
01685   inline Level level(void) const {
01686     return m_level;
01687   }
01688
01690   inline ConfigurationType configurationType(void) const {
01691     return m_configurationType;
01692   }
01693
01695   inline const std::string& value(void) const {
01696     return m_value;
01697   }
01698
01702   inline void setValue(const std::string& value) {
01703     m_value = value;
01704   }
01705
01706   virtual void log(el::base::type::ostream_t& os) const;
01707
01709   class Predicate {
01710    public:
01711     Predicate(Level level, ConfigurationType configurationType);
01712
01713     bool operator()(const Configuration* conf) const;
01714
01715    private:
```

```
01716     Level m_level;
01717     ConfigurationType m_configurationType;
01718   };
01719
01720  private:
01721   Level m_level;
01722   ConfigurationType m_configurationType;
01723   std::string m_value;
01724 };
01725
01729 class Configurations : public base::utils::RegistryWithPred<Configuration, Configuration::Predicate> {
01730  public:
01732   Configurations(void);
01733
01740   Configurations(const std::string& configurationFile, bool useDefaultsForRemaining = true,
01741                  Configurations* base = nullptr);
01742
01743   virtual ~Configurations(void) {
01744   }
01745
01752   bool parseFromFile(const std::string& configurationFile, Configurations* base = nullptr);
01753
01762   bool parseFromText(const std::string& configurationsString, Configurations* base = nullptr);
01763
01766   void setFromBase(Configurations* base);
01767
01772   bool hasConfiguration(ConfigurationType configurationType);
01773
01777   bool hasConfiguration(Level level, ConfigurationType configurationType);
01778
01791   void set(Level level, ConfigurationType configurationType, const std::string& value);
01792
01795   void set(Configuration* conf);
01796
01797   inline Configuration* get(Level level, ConfigurationType configurationType) {
01798     base::threading::ScopedLock scopedLock(lock());
01799     return RegistryWithPred<Configuration, Configuration::Predicate>::get(level, configurationType);
01800   }
01801
01806   inline void setGlobally(ConfigurationType configurationType, const std::string& value) {
01807     setGlobally(configurationType, value, false);
01808   }
01809
01811   inline void clear(void) {
01812     base::threading::ScopedLock scopedLock(lock());
01813     unregisterAll();
01814   }
01815
01819   inline const std::string& configurationFile(void) const {
01820     return m_configurationFile;
01821   }
01822
01824   void setToDefault(void);
01825
01833   void setRemainingToDefault(void);
01834
01839   class Parser : base::StaticClass {
01840    public:
01848     static bool parseFromFile(const std::string& configurationFile, Configurations* sender,
01849                               Configurations* base = nullptr);
01850
01861     static bool parseFromText(const std::string& configurationsString, Configurations* sender,
01862                               Configurations* base = nullptr);
01863
01864    private:
01865     friend class el::Loggers;
01866     static void ignoreComments(std::string* line);
01867     static bool isLevel(const std::string& line);
01868     static bool isComment(const std::string& line);
01869     static inline bool isConfig(const std::string& line);
01870     static bool parseLine(std::string* line, std::string* currConfigStr, std::string* currLevelStr,
      Level* currLevel,
01871                           Configurations* conf);
01872   };
01873
01874  private:
01875   std::string m_configurationFile;
01876   bool m_isFromFile;
01877   friend class el::Loggers;
01878
01880   void unsafeSetIfNotExist(Level level, ConfigurationType configurationType, const std::string&
      value);
01881
01883   void unsafeSet(Level level, ConfigurationType configurationType, const std::string& value);
01884
01887   void setGlobally(ConfigurationType configurationType, const std::string& value, bool
      includeGlobalLevel);
```

```
01888
01891   void unsafeSetGlobally(ConfigurationType configurationType, const std::string& value, bool
      includeGlobalLevel);
01892 };
01893
01894 namespace base {
01895 typedef std::shared_ptr<base::type::fstream_t> FileStreamPtr;
01896 typedef std::unordered_map<std::string, FileStreamPtr> LogStreamsReferenceMap;
01897 typedef std::shared_ptr<base::LogStreamsReferenceMap> LogStreamsReferenceMapPtr;
01904 class TypedConfigurations : public base::threading::ThreadSafe {
01905  public:
01909   TypedConfigurations(Configurations* configurations, LogStreamsReferenceMapPtr logStreamsReference);
01910
01911   TypedConfigurations(const TypedConfigurations& other);
01912
01913   virtual ~TypedConfigurations(void) {
01914   }
01915
01916   const Configurations* configurations(void) const {
01917     return m_configurations;
01918   }
01919
01920   bool enabled(Level level);
01921   bool toFile(Level level);
01922   const std::string& filename(Level level);
01923   bool toStandardOutput(Level level);
01924   const base::LogFormat& logFormat(Level level);
01925   const base::SubsecondPrecision& subsecondPrecision(Level level = Level::Global);
01926   const base::MillisecondsWidth& millisecondsWidth(Level level = Level::Global);
01927   bool performanceTracking(Level level = Level::Global);
01928   base::type::fstream_t* fileStream(Level level);
01929   std::size_t maxLogFileSize(Level level);
01930   std::size_t logFlushThreshold(Level level);
01931
01932  private:
01933   Configurations* m_configurations;
01934   std::unordered_map<Level, bool> m_enabledMap;
01935   std::unordered_map<Level, bool> m_toFileMap;
01936   std::unordered_map<Level, std::string> m_filenameMap;
01937   std::unordered_map<Level, bool> m_toStandardOutputMap;
01938   std::unordered_map<Level, base::LogFormat> m_logFormatMap;
01939   std::unordered_map<Level, base::SubsecondPrecision> m_subsecondPrecisionMap;
01940   std::unordered_map<Level, bool> m_performanceTrackingMap;
01941   std::unordered_map<Level, base::FileStreamPtr> m_fileStreamMap;
01942   std::unordered_map<Level, std::size_t> m_maxLogFileSizeMap;
01943   std::unordered_map<Level, std::size_t> m_logFlushThresholdMap;
01944   LogStreamsReferenceMapPtr m_logStreamsReference = nullptr;
01945
01946   friend class el::Helpers;
01947   friend class el::base::MessageBuilder;
01948   friend class el::base::Writer;
01949   friend class el::base::DefaultLogDispatchCallback;
01950   friend class el::base::LogDispatcher;
01951
01952   template <typename Conf_T>
01953   inline Conf_T getConfigByVal(Level level, const std::unordered_map<Level, Conf_T>* confMap, const
      char* confName) {
01954     base::threading::ScopedLock scopedLock(lock());
01955     return unsafeGetConfigByVal(level, confMap, confName);  // This is not unsafe anymore - mutex
      locked in scope
01956   }
01957
01958   template <typename Conf_T>
01959   inline Conf_T& getConfigByRef(Level level, std::unordered_map<Level, Conf_T>* confMap, const char*
      confName) {
01960     base::threading::ScopedLock scopedLock(lock());
01961     return unsafeGetConfigByRef(level, confMap, confName);  // This is not unsafe anymore - mutex
      locked in scope
01962   }
01963
01964   template <typename Conf_T>
01965   Conf_T unsafeGetConfigByVal(Level level, const std::unordered_map<Level, Conf_T>* confMap, const
      char* confName) {
01966     ELPP_UNUSED(confName);
01967     typename std::unordered_map<Level, Conf_T>::const_iterator it = confMap->find(level);
01968     if (it == confMap->end()) {
01969       try {
01970         return confMap->at(Level::Global);
01971       } catch (...) {
01972         ELPP_INTERNAL_ERROR("Unable to get configuration [" << confName << "] for level ["
01973                             << LevelHelper::convertToString(level) << "]"
01974                             << std::endl << "Please ensure you have properly configured logger.",
      false);
01975         return Conf_T();
01976       }
01977     }
01978     return it->second;
```

```
01979   }
01980
01981   template <typename Conf_T>
01982   Conf_T& unsafeGetConfigByRef(Level level, std::unordered_map<Level, Conf_T>* confMap, const char*
      confName) {
01983     ELPP_UNUSED(confName);
01984     typename std::unordered_map<Level, Conf_T>::iterator it = confMap->find(level);
01985     if (it == confMap->end()) {
01986       try {
01987         return confMap->at(Level::Global);
01988       } catch (...) {
01989         ELPP_INTERNAL_ERROR("Unable to get configuration [" << confName << "] for level ["
01990                             << LevelHelper::convertToString(level) << "]"
01991                             << std::endl << "Please ensure you have properly configured logger.",
      false);
01992       }
01993     }
01994     return it->second;
01995   }
01996
01997   template <typename Conf_T>
01998   void setValue(Level level, const Conf_T& value, std::unordered_map<Level, Conf_T>* confMap,
01999                 bool includeGlobalLevel = true) {
02000     // If map is empty and we are allowed to add into generic level (Level::Global), do it!
02001     if (confMap->empty() && includeGlobalLevel) {
02002       confMap->insert(std::make_pair(Level::Global, value));
02003       return;
02004     }
02005     // If same value exist in generic level already, dont add it to explicit level
02006     typename std::unordered_map<Level, Conf_T>::iterator it = confMap->find(Level::Global);
02007     if (it != confMap->end() && it->second == value) {
02008       return;
02009     }
02010     // Now make sure we dont double up values if we really need to add it to explicit level
02011     it = confMap->find(level);
02012     if (it == confMap->end()) {
02013       // Value not found for level, add new
02014       confMap->insert(std::make_pair(level, value));
02015     } else {
02016       // Value found, just update value
02017       confMap->at(level) = value;
02018     }
02019   }
02020
02021   void build(Configurations* configurations);
02022   unsigned long getULong(std::string confVal);
02023   std::string resolveFilename(const std::string& filename);
02024   void insertFile(Level level, const std::string& fullFilename);
02025   bool unsafeValidateFileRolling(Level level, const PreRollOutCallback& preRollOutCallback);
02026
02027   inline bool validateFileRolling(Level level, const PreRollOutCallback& preRollOutCallback) {
02028     base::threading::ScopedLock scopedLock(lock());
02029     return unsafeValidateFileRolling(level, preRollOutCallback);
02030   }
02031 };
02033 class HitCounter {
02034  public:
02035   HitCounter(void) :
02036     m_filename(""),
02037     m_lineNumber(0),
02038     m_hitCounts(0) {
02039   }
02040
02041   HitCounter(const char* filename, base::type::LineNumber lineNumber) :
02042     m_filename(filename),
02043     m_lineNumber(lineNumber),
02044     m_hitCounts(0) {
02045   }
02046
02047   HitCounter(const HitCounter& hitCounter) :
02048     m_filename(hitCounter.m_filename),
02049     m_lineNumber(hitCounter.m_lineNumber),
02050     m_hitCounts(hitCounter.m_hitCounts) {
02051   }
02052
02053   HitCounter& operator=(const HitCounter& hitCounter) {
02054     if (&hitCounter != this) {
02055       m_filename = hitCounter.m_filename;
02056       m_lineNumber = hitCounter.m_lineNumber;
02057       m_hitCounts = hitCounter.m_hitCounts;
02058     }
02059     return *this;
02060   }
02061
02062   virtual ~HitCounter(void) {
02063   }
02064
```

```
02066   inline void resetLocation(const char* filename, base::type::LineNumber lineNumber) {
02067     m_filename = filename;
02068     m_lineNumber = lineNumber;
02069   }
02070
02072   inline void validateHitCounts(std::size_t n) {
02073     if (m_hitCounts >= base::consts::kMaxLogPerCounter) {
02074       m_hitCounts = (n >= 1 ? base::consts::kMaxLogPerCounter % n : 0);
02075     }
02076     ++m_hitCounts;
02077   }
02078
02079   inline const char* filename(void) const {
02080     return m_filename;
02081   }
02082
02083   inline base::type::LineNumber lineNumber(void) const {
02084     return m_lineNumber;
02085   }
02086
02087   inline std::size_t hitCounts(void) const {
02088     return m_hitCounts;
02089   }
02090
02091   inline void increment(void) {
02092     ++m_hitCounts;
02093   }
02094
02095   class Predicate {
02096    public:
02097     Predicate(const char* filename, base::type::LineNumber lineNumber)
02098       : m_filename(filename),
02099         m_lineNumber(lineNumber) {
02100     }
02101     inline bool operator()(const HitCounter* counter) {
02102       return ((counter != nullptr) &&
02103               (strcmp(counter->m_filename, m_filename) == 0) &&
02104               (counter->m_lineNumber == m_lineNumber));
02105     }
02106
02107    private:
02108     const char* m_filename;
02109     base::type::LineNumber m_lineNumber;
02110   };
02111
02112  private:
02113   const char* m_filename;
02114   base::type::LineNumber m_lineNumber;
02115   std::size_t m_hitCounts;
02116 };
02118 class RegisteredHitCounters : public base::utils::RegistryWithPred<base::HitCounter,
      base::HitCounter::Predicate> {
02119  public:
02122   bool validateEveryN(const char* filename, base::type::LineNumber lineNumber, std::size_t n);
02123
02126   bool validateAfterN(const char* filename, base::type::LineNumber lineNumber, std::size_t n);
02127
02130   bool validateNTimes(const char* filename, base::type::LineNumber lineNumber, std::size_t n);
02131
02133   inline const base::HitCounter* getCounter(const char* filename, base::type::LineNumber lineNumber) {
02134     base::threading::ScopedLock scopedLock(lock());
02135     return get(filename, lineNumber);
02136   }
02137 };
02139 enum class DispatchAction : base::type::EnumType {
02140   None = 1, NormalLog = 2, SysLog = 4
02141 };
02142 }  // namespace base
02143 template <typename T>
02144 class Callback : protected base::threading::ThreadSafe {
02145  public:
02146   Callback(void) : m_enabled(true) {}
02147   inline bool enabled(void) const {
02148     return m_enabled;
02149   }
02150   inline void setEnabled(bool enabled) {
02151     base::threading::ScopedLock scopedLock(lock());
02152     m_enabled = enabled;
02153   }
02154  protected:
02155   virtual void handle(const T* handlePtr) = 0;
02156  private:
02157   bool m_enabled;
02158 };
02159 class LogDispatchData {
02160  public:
02161   LogDispatchData() : m_logMessage(nullptr), m_dispatchAction(base::DispatchAction::None) {}
```

```
02162   inline const LogMessage* logMessage(void) const {
02163     return m_logMessage;
02164   }
02165   inline base::DispatchAction dispatchAction(void) const {
02166     return m_dispatchAction;
02167   }
02168   inline void setLogMessage(LogMessage* logMessage) {
02169     m_logMessage = logMessage;
02170   }
02171   inline void setDispatchAction(base::DispatchAction dispatchAction) {
02172     m_dispatchAction = dispatchAction;
02173   }
02174  private:
02175   LogMessage* m_logMessage;
02176   base::DispatchAction m_dispatchAction;
02177   friend class base::LogDispatcher;
02178
02179 };
02180 class LogDispatchCallback : public Callback<LogDispatchData> {
02181  protected:
02182   virtual void handle(const LogDispatchData* data);
02183   base::threading::Mutex& fileHandle(const LogDispatchData* data);
02184  private:
02185   friend class base::LogDispatcher;
02186   std::unordered_map<std::string, std::unique_ptr<base::threading::Mutex» m_fileLocks;
02187   base::threading::Mutex m_fileLocksMapLock;
02188 };
02189 class PerformanceTrackingCallback : public Callback<PerformanceTrackingData> {
02190  private:
02191   friend class base::PerformanceTracker;
02192 };
02193 class LoggerRegistrationCallback : public Callback<Logger> {
02194  private:
02195   friend class base::RegisteredLoggers;
02196 };
02197 class LogBuilder : base::NoCopy {
02198  public:
02199   LogBuilder() : m_termSupportsColor(base::utils::OS::termSupportsColor()) {}
02200   virtual ~LogBuilder(void) {
02201     ELPP_INTERNAL_INFO(3, "Destroying log builder...")
02202   }
02203   virtual base::type::string_t build(const LogMessage* logMessage, bool appendNewLine) const = 0;
02204   void convertToColoredOutput(base::type::string_t* logLine, Level level);
02205  private:
02206   bool m_termSupportsColor;
02207   friend class el::base::DefaultLogDispatchCallback;
02208 };
02209 typedef std::shared_ptr<LogBuilder> LogBuilderPtr;
02213 class Logger : public base::threading::ThreadSafe, public Loggable {
02214  public:
02215   Logger(const std::string& id, base::LogStreamsReferenceMapPtr logStreamsReference);
02216   Logger(const std::string& id, const Configurations& configurations, base::LogStreamsReferenceMapPtr
     logStreamsReference);
02217   Logger(const Logger& logger);
02218   Logger& operator=(const Logger& logger);
02219
02220   virtual ~Logger(void) {
02221     base::utils::safeDelete(m_typedConfigurations);
02222   }
02223
02224   virtual inline void log(el::base::type::ostream_t& os) const {
02225     os « m_id.c_str();
02226   }
02227
02229   void configure(const Configurations& configurations);
02230
02232   void reconfigure(void);
02233
02234   inline const std::string& id(void) const {
02235     return m_id;
02236   }
02237
02238   inline const std::string& parentApplicationName(void) const {
02239     return m_parentApplicationName;
02240   }
02241
02242   inline void setParentApplicationName(const std::string& parentApplicationName) {
02243     m_parentApplicationName = parentApplicationName;
02244   }
02245
02246   inline Configurations* configurations(void) {
02247     return &m_configurations;
02248   }
02249
02250   inline base::TypedConfigurations* typedConfigurations(void) {
02251     return m_typedConfigurations;
02252   }
```

```
02253
02254   static bool isValidId(const std::string& id);
02255
02257   void flush(void);
02258
02259   void flush(Level level, base::type::fstream_t* fs);
02260
02261   inline bool isFlushNeeded(Level level) {
02262     return ++m_unflushedCount.find(level)->second >= m_typedConfigurations->logFlushThreshold(level);
02263   }
02264
02265   inline LogBuilder* logBuilder(void) const {
02266     return m_logBuilder.get();
02267   }
02268
02269   inline void setLogBuilder(const LogBuilderPtr& logBuilder) {
02270     m_logBuilder = logBuilder;
02271   }
02272
02273   inline bool enabled(Level level) const {
02274     return m_typedConfigurations->enabled(level);
02275   }
02276
02277 #if ELPP_VARIADIC_TEMPLATES_SUPPORTED
02278 #  define LOGGER_LEVEL_WRITERS_SIGNATURES(FUNCTION_NAME)\
02279 template <typename T, typename... Args>\
02280 inline void FUNCTION_NAME(const char*, const T&, const Args&...);\
02281 template <typename T>\
02282 inline void FUNCTION_NAME(const T&);
02283
02284   template <typename T, typename... Args>
02285   inline void verbose(int, const char*, const T&, const Args&...);
02286
02287   template <typename T>
02288   inline void verbose(int, const T&);
02289
02290   LOGGER_LEVEL_WRITERS_SIGNATURES(info)
02291   LOGGER_LEVEL_WRITERS_SIGNATURES(debug)
02292   LOGGER_LEVEL_WRITERS_SIGNATURES(warn)
02293   LOGGER_LEVEL_WRITERS_SIGNATURES(error)
02294   LOGGER_LEVEL_WRITERS_SIGNATURES(fatal)
02295   LOGGER_LEVEL_WRITERS_SIGNATURES(trace)
02296 #  undef LOGGER_LEVEL_WRITERS_SIGNATURES
02297 #endif // ELPP_VARIADIC_TEMPLATES_SUPPORTED
02298  private:
02299   std::string m_id;
02300   base::TypedConfigurations* m_typedConfigurations;
02301   base::type::stringstream_t m_stream;
02302   std::string m_parentApplicationName;
02303   bool m_isConfigured;
02304   Configurations m_configurations;
02305   std::unordered_map<Level, unsigned int> m_unflushedCount;
02306   base::LogStreamsReferenceMapPtr m_logStreamsReference = nullptr;
02307   LogBuilderPtr m_logBuilder;
02308
02309   friend class el::LogMessage;
02310   friend class el::Loggers;
02311   friend class el::Helpers;
02312   friend class el::base::RegisteredLoggers;
02313   friend class el::base::DefaultLogDispatchCallback;
02314   friend class el::base::MessageBuilder;
02315   friend class el::base::Writer;
02316   friend class el::base::PErrorWriter;
02317   friend class el::base::Storage;
02318   friend class el::base::PerformanceTracker;
02319   friend class el::base::LogDispatcher;
02320
02321   Logger(void);
02322
02323 #if ELPP_VARIADIC_TEMPLATES_SUPPORTED
02324   template <typename T, typename... Args>
02325   void log_(Level, int, const char*, const T&, const Args&...);
02326
02327   template <typename T>
02328   inline void log_(Level, int, const T&);
02329
02330   template <typename T, typename... Args>
02331   void log(Level, const char*, const T&, const Args&...);
02332
02333   template <typename T>
02334   inline void log(Level, const T&);
02335 #endif // ELPP_VARIADIC_TEMPLATES_SUPPORTED
02336
02337   void initUnflushedCount(void);
02338
02339   inline base::type::stringstream_t& stream(void) {
02340     return m_stream;
```

```
02341   }
02342
02343   void resolveLoggerFormatSpec(void) const;
02344 };
02345 namespace base {
02347 class RegisteredLoggers : public base::utils::Registry<Logger, std::string> {
02348  public:
02349   explicit RegisteredLoggers(const LogBuilderPtr& defaultLogBuilder);
02350
02351   virtual ~RegisteredLoggers(void) {
02352     unsafeFlushAll();
02353   }
02354
02355   inline void setDefaultConfigurations(const Configurations& configurations) {
02356     base::threading::ScopedLock scopedLock(lock());
02357     m_defaultConfigurations.setFromBase(const_cast<Configurations*>(&configurations));
02358   }
02359
02360   inline Configurations* defaultConfigurations(void) {
02361     return &m_defaultConfigurations;
02362   }
02363
02364   Logger* get(const std::string& id, bool forceCreation = true);
02365
02366   template <typename T>
02367   inline bool installLoggerRegistrationCallback(const std::string& id) {
02368     return base::utils::Utils::installCallback<T, base::type::LoggerRegistrationCallbackPtr>(id,
02369            &m_loggerRegistrationCallbacks);
02370   }
02371
02372   template <typename T>
02373   inline void uninstallLoggerRegistrationCallback(const std::string& id) {
02374     base::utils::Utils::uninstallCallback<T, base::type::LoggerRegistrationCallbackPtr>(id,
    &m_loggerRegistrationCallbacks);
02375   }
02376
02377   template <typename T>
02378   inline T* loggerRegistrationCallback(const std::string& id) {
02379     return base::utils::Utils::callback<T, base::type::LoggerRegistrationCallbackPtr>(id,
    &m_loggerRegistrationCallbacks);
02380   }
02381
02382   bool remove(const std::string& id);
02383
02384   inline bool has(const std::string& id) {
02385     return get(id, false) != nullptr;
02386   }
02387
02388   inline void unregister(Logger*& logger) {
02389     base::threading::ScopedLock scopedLock(lock());
02390     base::utils::Registry<Logger, std::string>::unregister(logger->id());
02391   }
02392
02393   inline LogStreamsReferenceMapPtr logStreamsReference(void) {
02394     return m_logStreamsReference;
02395   }
02396
02397   inline void flushAll(void) {
02398     base::threading::ScopedLock scopedLock(lock());
02399     unsafeFlushAll();
02400   }
02401
02402   inline void setDefaultLogBuilder(LogBuilderPtr& logBuilderPtr) {
02403     base::threading::ScopedLock scopedLock(lock());
02404     m_defaultLogBuilder = logBuilderPtr;
02405   }
02406
02407  private:
02408   LogBuilderPtr m_defaultLogBuilder;
02409   Configurations m_defaultConfigurations;
02410   base::LogStreamsReferenceMapPtr m_logStreamsReference = nullptr;
02411   std::unordered_map<std::string, base::type::LoggerRegistrationCallbackPtr>
    m_loggerRegistrationCallbacks;
02412   friend class el::base::Storage;
02413
02414   void unsafeFlushAll(void);
02415 };
02417 class VRegistry : base::NoCopy, public base::threading::ThreadSafe {
02418  public:
02419   explicit VRegistry(base::type::VerboseLevel level, base::type::EnumType* pFlags);
02420
02422   void setLevel(base::type::VerboseLevel level);
02423
02424   inline base::type::VerboseLevel level(void) const {
02425     return m_level;
02426   }
02427
```

```
02428   inline void clearModules(void) {
02429     base::threading::ScopedLock scopedLock(lock());
02430     m_modules.clear();
02431   }
02432
02433   void setModules(const char* modules);
02434
02435   bool allowed(base::type::VerboseLevel vlevel, const char* file);
02436
02437   inline const std::unordered_map<std::string, base::type::VerboseLevel>& modules(void) const {
02438     return m_modules;
02439   }
02440
02441   void setFromArgs(const base::utils::CommandLineArgs* commandLineArgs);
02442
02444   inline bool vModulesEnabled(void) {
02445     return !base::utils::hasFlag(LoggingFlag::DisableVModules, *m_pFlags);
02446   }
02447
02448  private:
02449   base::type::VerboseLevel m_level;
02450   base::type::EnumType* m_pFlags;
02451   std::unordered_map<std::string, base::type::VerboseLevel> m_modules;
02452 };
02453 }  // namespace base
02454 class LogMessage {
02455  public:
02456   LogMessage(Level level, const std::string& file, base::type::LineNumber line, const std::string&
      func,
02457              base::type::VerboseLevel verboseLevel, Logger* logger) :
02458     m_level(level), m_file(file), m_line(line), m_func(func),
02459     m_verboseLevel(verboseLevel), m_logger(logger), m_message(logger->stream().str()) {
02460   }
02461   inline Level level(void) const {
02462     return m_level;
02463   }
02464   inline const std::string& file(void) const {
02465     return m_file;
02466   }
02467   inline base::type::LineNumber line(void) const {
02468     return m_line;
02469   }
02470   inline const std::string& func(void) const {
02471     return m_func;
02472   }
02473   inline base::type::VerboseLevel verboseLevel(void) const {
02474     return m_verboseLevel;
02475   }
02476   inline Logger* logger(void) const {
02477     return m_logger;
02478   }
02479   inline const base::type::string_t& message(void) const {
02480     return m_message;
02481   }
02482  private:
02483   Level m_level;
02484   std::string m_file;
02485   base::type::LineNumber m_line;
02486   std::string m_func;
02487   base::type::VerboseLevel m_verboseLevel;
02488   Logger* m_logger;
02489   base::type::string_t m_message;
02490 };
02491 namespace base {
02492 #if ELPP_ASYNC_LOGGING
02493 class AsyncLogItem {
02494  public:
02495   explicit AsyncLogItem(const LogMessage& logMessage, const LogDispatchData& data, const
      base::type::string_t& logLine)
02496     : m_logMessage(logMessage), m_dispatchData(data), m_logLine(logLine) {}
02497   virtual ~AsyncLogItem() {}
02498   inline LogMessage* logMessage(void) {
02499     return &m_logMessage;
02500   }
02501   inline LogDispatchData* data(void) {
02502     return &m_dispatchData;
02503   }
02504   inline base::type::string_t logLine(void) {
02505     return m_logLine;
02506   }
02507  private:
02508   LogMessage m_logMessage;
02509   LogDispatchData m_dispatchData;
02510   base::type::string_t m_logLine;
02511 };
02512 class AsyncLogQueue : public base::threading::ThreadSafe {
02513  public:
```

```
02514   virtual ~AsyncLogQueue() {
02515     ELPP_INTERNAL_INFO(6, "~AsyncLogQueue");
02516   }
02517
02518   inline AsyncLogItem next(void) {
02519     base::threading::ScopedLock scopedLock(lock());
02520     AsyncLogItem result = m_queue.front();
02521     m_queue.pop();
02522     return result;
02523   }
02524
02525   inline void push(const AsyncLogItem& item) {
02526     base::threading::ScopedLock scopedLock(lock());
02527     m_queue.push(item);
02528   }
02529   inline void pop(void) {
02530     base::threading::ScopedLock scopedLock(lock());
02531     m_queue.pop();
02532   }
02533   inline AsyncLogItem front(void) {
02534     base::threading::ScopedLock scopedLock(lock());
02535     return m_queue.front();
02536   }
02537   inline bool empty(void) {
02538     base::threading::ScopedLock scopedLock(lock());
02539     return m_queue.empty();
02540   }
02541  private:
02542   std::queue<AsyncLogItem> m_queue;
02543 };
02544 class IWorker {
02545  public:
02546   virtual ~IWorker() {}
02547   virtual void start() = 0;
02548 };
02549 #endif // ELPP_ASYNC_LOGGING
02551 class Storage : base::NoCopy, public base::threading::ThreadSafe {
02552  public:
02553 #if ELPP_ASYNC_LOGGING
02554   Storage(const LogBuilderPtr& defaultLogBuilder, base::IWorker* asyncDispatchWorker);
02555 #else
02556   explicit Storage(const LogBuilderPtr& defaultLogBuilder);
02557 #endif  // ELPP_ASYNC_LOGGING
02558
02559   virtual ~Storage(void);
02560
02561   inline bool validateEveryNCounter(const char* filename, base::type::LineNumber lineNumber,
      std::size_t occasion) {
02562     return hitCounters()->validateEveryN(filename, lineNumber, occasion);
02563   }
02564
02565   inline bool validateAfterNCounter(const char* filename, base::type::LineNumber lineNumber,
      std::size_t n) {
02566     return hitCounters()->validateAfterN(filename, lineNumber, n);
02567   }
02568
02569   inline bool validateNTimesCounter(const char* filename, base::type::LineNumber lineNumber,
      std::size_t n) {
02570     return hitCounters()->validateNTimes(filename, lineNumber, n);
02571   }
02572
02573   inline base::RegisteredHitCounters* hitCounters(void) const {
02574     return m_registeredHitCounters;
02575   }
02576
02577   inline base::RegisteredLoggers* registeredLoggers(void) const {
02578     return m_registeredLoggers;
02579   }
02580
02581   inline base::VRegistry* vRegistry(void) const {
02582     return m_vRegistry;
02583   }
02584
02585 #if ELPP_ASYNC_LOGGING
02586   inline base::AsyncLogQueue* asyncLogQueue(void) const {
02587     return m_asyncLogQueue;
02588   }
02589 #endif  // ELPP_ASYNC_LOGGING
02590
02591   inline const base::utils::CommandLineArgs* commandLineArgs(void) const {
02592     return &m_commandLineArgs;
02593   }
02594
02595   inline void addFlag(LoggingFlag flag) {
02596     base::utils::addFlag(flag, &m_flags);
02597   }
02598
```

```
02599   inline void removeFlag(LoggingFlag flag) {
02600     base::utils::removeFlag(flag, &m_flags);
02601   }
02602
02603   inline bool hasFlag(LoggingFlag flag) const {
02604     return base::utils::hasFlag(flag, m_flags);
02605   }
02606
02607   inline base::type::EnumType flags(void) const {
02608     return m_flags;
02609   }
02610
02611   inline void setFlags(base::type::EnumType flags) {
02612     m_flags = flags;
02613   }
02614
02615   inline void setPreRollOutCallback(const PreRollOutCallback& callback) {
02616     m_preRollOutCallback = callback;
02617   }
02618
02619   inline void unsetPreRollOutCallback(void) {
02620     m_preRollOutCallback = base::defaultPreRollOutCallback;
02621   }
02622
02623   inline PreRollOutCallback& preRollOutCallback(void) {
02624     return m_preRollOutCallback;
02625   }
02626
02627   bool hasCustomFormatSpecifier(const char* formatSpecifier);
02628   void installCustomFormatSpecifier(const CustomFormatSpecifier& customFormatSpecifier);
02629   bool uninstallCustomFormatSpecifier(const char* formatSpecifier);
02630
02631   const std::vector<CustomFormatSpecifier>* customFormatSpecifiers(void) const {
02632     return &m_customFormatSpecifiers;
02633   }
02634
02635   base::threading::Mutex& customFormatSpecifiersLock() {
02636     return m_customFormatSpecifiersLock;
02637   }
02638
02639   inline void setLoggingLevel(Level level) {
02640     m_loggingLevel = level;
02641   }
02642
02643   template <typename T>
02644   inline bool installLogDispatchCallback(const std::string& id) {
02645     return base::utils::Utils::installCallback<T, base::type::LogDispatchCallbackPtr>(id,
      &m_logDispatchCallbacks);
02646   }
02647
02648   template <typename T>
02649   inline void uninstallLogDispatchCallback(const std::string& id) {
02650     base::utils::Utils::uninstallCallback<T, base::type::LogDispatchCallbackPtr>(id,
      &m_logDispatchCallbacks);
02651   }
02652   template <typename T>
02653   inline T* logDispatchCallback(const std::string& id) {
02654     return base::utils::Utils::callback<T, base::type::LogDispatchCallbackPtr>(id,
      &m_logDispatchCallbacks);
02655   }
02656
02657 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
02658   template <typename T>
02659   inline bool installPerformanceTrackingCallback(const std::string& id) {
02660     return base::utils::Utils::installCallback<T, base::type::PerformanceTrackingCallbackPtr>(id,
02661            &m_performanceTrackingCallbacks);
02662   }
02663
02664   template <typename T>
02665   inline void uninstallPerformanceTrackingCallback(const std::string& id) {
02666     base::utils::Utils::uninstallCallback<T, base::type::PerformanceTrackingCallbackPtr>(id,
02667         &m_performanceTrackingCallbacks);
02668   }
02669
02670   template <typename T>
02671   inline T* performanceTrackingCallback(const std::string& id) {
02672     return base::utils::Utils::callback<T, base::type::PerformanceTrackingCallbackPtr>(id,
      &m_performanceTrackingCallbacks);
02673   }
02674 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
02675
02677   inline void setThreadName(const std::string& name) {
02678     if (name.empty()) return;
02679     base::threading::ScopedLock scopedLock(m_threadNamesLock);
02680     m_threadNames[base::threading::getCurrentThreadId()] = name;
02681   }
02682
```

```
02683   inline std::string getThreadName(const std::string& threadId) {
02684     base::threading::ScopedLock scopedLock(m_threadNamesLock);
02685     std::unordered_map<std::string, std::string>::const_iterator it = m_threadNames.find(threadId);
02686     if (it == m_threadNames.end()) {
02687       return threadId;
02688     }
02689     return it->second;
02690   }
02691  private:
02692   base::RegisteredHitCounters* m_registeredHitCounters;
02693   base::RegisteredLoggers* m_registeredLoggers;
02694   base::type::EnumType m_flags;
02695   base::VRegistry* m_vRegistry;
02696 #if ELPP_ASYNC_LOGGING
02697   base::AsyncLogQueue* m_asyncLogQueue;
02698   base::IWorker* m_asyncDispatchWorker;
02699 #endif  // ELPP_ASYNC_LOGGING
02700   base::utils::CommandLineArgs m_commandLineArgs;
02701   PreRollOutCallback m_preRollOutCallback;
02702   std::unordered_map<std::string, base::type::LogDispatchCallbackPtr> m_logDispatchCallbacks;
02703   std::unordered_map<std::string, base::type::PerformanceTrackingCallbackPtr>
    m_performanceTrackingCallbacks;
02704   std::unordered_map<std::string, std::string> m_threadNames;
02705   std::vector<CustomFormatSpecifier> m_customFormatSpecifiers;
02706   base::threading::Mutex m_customFormatSpecifiersLock;
02707   base::threading::Mutex m_threadNamesLock;
02708   Level m_loggingLevel;
02709
02710   friend class el::Helpers;
02711   friend class el::base::DefaultLogDispatchCallback;
02712   friend class el::LogBuilder;
02713   friend class el::base::MessageBuilder;
02714   friend class el::base::Writer;
02715   friend class el::base::PerformanceTracker;
02716   friend class el::base::LogDispatcher;
02717
02718   void setApplicationArguments(int argc, char** argv);
02719
02720   inline void setApplicationArguments(int argc, const char** argv) {
02721     setApplicationArguments(argc, const_cast<char**>(argv));
02722   }
02723 };
02724 extern ELPP_EXPORT base::type::StoragePointer elStorage;
02725 #define ELPP el::base::elStorage
02726 class DefaultLogDispatchCallback : public LogDispatchCallback {
02727  protected:
02728   void handle(const LogDispatchData* data);
02729  private:
02730   const LogDispatchData* m_data;
02731   void dispatch(base::type::string_t&& logLine);
02732 };
02733 #if ELPP_ASYNC_LOGGING
02734 class AsyncLogDispatchCallback : public LogDispatchCallback {
02735  protected:
02736   void handle(const LogDispatchData* data);
02737 };
02738 class AsyncDispatchWorker : public base::IWorker, public base::threading::ThreadSafe {
02739  public:
02740   AsyncDispatchWorker();
02741   virtual ~AsyncDispatchWorker();
02742
02743   bool clean(void);
02744   void emptyQueue(void);
02745   virtual void start(void);
02746   void handle(AsyncLogItem* logItem);
02747   void run(void);
02748
02749   void setContinueRunning(bool value) {
02750     base::threading::ScopedLock scopedLock(m_continueRunningLock);
02751     m_continueRunning = value;
02752   }
02753
02754   bool continueRunning(void) const {
02755     return m_continueRunning;
02756   }
02757  private:
02758   std::condition_variable cv;
02759   bool m_continueRunning;
02760   base::threading::Mutex m_continueRunningLock;
02761 };
02762 #endif  // ELPP_ASYNC_LOGGING
02763 }  // namespace base
02764 namespace base {
02765 class DefaultLogBuilder : public LogBuilder {
02766  public:
02767   base::type::string_t build(const LogMessage* logMessage, bool appendNewLine) const;
02768 };
```

```
02770 class LogDispatcher : base::NoCopy {
02771  public:
02772   LogDispatcher(bool proceed, LogMessage* logMessage, base::DispatchAction dispatchAction) :
02773     m_proceed(proceed),
02774     m_logMessage(logMessage),
02775     m_dispatchAction(std::move(dispatchAction)) {
02776   }
02777
02778   void dispatch(void);
02779
02780  private:
02781   bool m_proceed;
02782   LogMessage* m_logMessage;
02783   base::DispatchAction m_dispatchAction;
02784 };
02785 #if defined(ELPP_STL_LOGGING)
02792 namespace workarounds {
02794 template <typename T, typename Container>
02795 class IterableContainer {
02796  public:
02797   typedef typename Container::iterator iterator;
02798   typedef typename Container::const_iterator const_iterator;
02799   IterableContainer(void) {}
02800   virtual ~IterableContainer(void) {}
02801   iterator begin(void) {
02802     return getContainer().begin();
02803   }
02804   iterator end(void) {
02805     return getContainer().end();
02806   }
02807  private:
02808   virtual Container& getContainer(void) = 0;
02809 };
02811 template<typename T, typename Container = std::vector<T>, typename Comparator = std::less<typename
      Container::value_type>>
02812 class IterablePriorityQueue : public IterableContainer<T, Container>,
02813   public std::priority_queue<T, Container, Comparator> {
02814  public:
02815   IterablePriorityQueue(std::priority_queue<T, Container, Comparator> queue_) {
02816     std::size_t count_ = 0;
02817     while (++count_ < base::consts::kMaxLogPerContainer && !queue_.empty()) {
02818       this->push(queue_.top());
02819       queue_.pop();
02820     }
02821   }
02822  private:
02823   inline Container& getContainer(void) {
02824     return this->c;
02825   }
02826 };
02828 template<typename T, typename Container = std::deque<T>>
02829 class IterableQueue : public IterableContainer<T, Container>, public std::queue<T, Container> {
02830  public:
02831   IterableQueue(std::queue<T, Container> queue_) {
02832     std::size_t count_ = 0;
02833     while (++count_ < base::consts::kMaxLogPerContainer && !queue_.empty()) {
02834       this->push(queue_.front());
02835       queue_.pop();
02836     }
02837   }
02838  private:
02839   inline Container& getContainer(void) {
02840     return this->c;
02841   }
02842 };
02844 template<typename T, typename Container = std::deque<T>>
02845 class IterableStack : public IterableContainer<T, Container>, public std::stack<T, Container> {
02846  public:
02847   IterableStack(std::stack<T, Container> stack_) {
02848     std::size_t count_ = 0;
02849     while (++count_ < base::consts::kMaxLogPerContainer && !stack_.empty()) {
02850       this->push(stack_.top());
02851       stack_.pop();
02852     }
02853   }
02854  private:
02855   inline Container& getContainer(void) {
02856     return this->c;
02857   }
02858 };
02859 }  // namespace workarounds
02860 #endif  // defined(ELPP_STL_LOGGING)
02861 // Log message builder
02862 class MessageBuilder {
02863  public:
02864   MessageBuilder(void) : m_logger(nullptr), m_containerLogSeparator(ELPP_LITERAL("")) {}
02865   void initialize(Logger* logger);
```

```
02866
02867 #  define ELPP_SIMPLE_LOG(LOG_TYPE)\
02868 MessageBuilder& operator<<(LOG_TYPE msg) {\
02869 m_logger->stream() << msg;\
02870 if (ELPP->hasFlag(LoggingFlag::AutoSpacing)) {\
02871 m_logger->stream() << " ";\
02872 }\
02873 return *this;\
02874 }
02875
02876   inline MessageBuilder& operator<<(const std::string& msg) {
02877     return operator<<(msg.c_str());
02878   }
02879   ELPP_SIMPLE_LOG(char)
02880   ELPP_SIMPLE_LOG(bool)
02881   ELPP_SIMPLE_LOG(signed short)
02882   ELPP_SIMPLE_LOG(unsigned short)
02883   ELPP_SIMPLE_LOG(signed int)
02884   ELPP_SIMPLE_LOG(unsigned int)
02885   ELPP_SIMPLE_LOG(signed long)
02886   ELPP_SIMPLE_LOG(unsigned long)
02887   ELPP_SIMPLE_LOG(float)
02888   ELPP_SIMPLE_LOG(double)
02889   ELPP_SIMPLE_LOG(char*)
02890   ELPP_SIMPLE_LOG(const char*)
02891   ELPP_SIMPLE_LOG(const void*)
02892   ELPP_SIMPLE_LOG(long double)
02893   inline MessageBuilder& operator<<(const std::wstring& msg) {
02894     return operator<<(msg.c_str());
02895   }
02896   MessageBuilder& operator<<(const wchar_t* msg);
02897   // ostream manipulators
02898   inline MessageBuilder& operator<<(std::ostream& (*OStreamMani)(std::ostream&)) {
02899     m_logger->stream() << OStreamMani;
02900     return *this;
02901   }
02902 #define ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(temp)                                                \
02903 template <typename T>                                                                             \
02904 inline MessageBuilder& operator<<(const temp<T>& template_inst) {                                \
02905 return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
02906 }
02907 #define ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(temp)                                                \
02908 template <typename T1, typename T2>                                                               \
02909 inline MessageBuilder& operator<<(const temp<T1, T2>& template_inst) {                           \
02910 return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
02911 }
02912 #define ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG(temp)                                              \
02913 template <typename T1, typename T2, typename T3>                                                  \
02914 inline MessageBuilder& operator<<(const temp<T1, T2, T3>& template_inst) {                       \
02915 return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
02916 }
02917 #define ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(temp)                                               \
02918 template <typename T1, typename T2, typename T3, typename T4>                                     \
02919 inline MessageBuilder& operator<<(const temp<T1, T2, T3, T4>& template_inst) {                   \
02920 return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
02921 }
02922 #define ELPP_ITERATOR_CONTAINER_LOG_FIVE_ARG(temp)                                               \
02923 template <typename T1, typename T2, typename T3, typename T4, typename T5>                        \
02924 inline MessageBuilder& operator<<(const temp<T1, T2, T3, T4, T5>& template_inst) {               \
02925 return writeIterator(template_inst.begin(), template_inst.end(), template_inst.size());      \
02926 }
02927
02928 #if defined(ELPP_STL_LOGGING)
02929   ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(std::vector)
02930   ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(std::list)
02931   ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(std::deque)
02932   ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG(std::set)
02933   ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG(std::multiset)
02934   ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(std::map)
02935   ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(std::multimap)
02936   template <class T, class Container>
02937   inline MessageBuilder& operator<<(const std::queue<T, Container>& queue_) {
02938     base::workarounds::IterableQueue<T, Container> iterableQueue_ =
02939       static_cast<base::workarounds::IterableQueue<T, Container> >(queue_);
02940     return writeIterator(iterableQueue_.begin(), iterableQueue_.end(), iterableQueue_.size());
02941   }
02942   template <class T, class Container>
02943   inline MessageBuilder& operator<<(const std::stack<T, Container>& stack_) {
02944     base::workarounds::IterableStack<T, Container> iterableStack_ =
02945       static_cast<base::workarounds::IterableStack<T, Container> >(stack_);
02946     return writeIterator(iterableStack_.begin(), iterableStack_.end(), iterableStack_.size());
02947   }
02948   template <class T, class Container, class Comparator>
02949   inline MessageBuilder& operator<<(const std::priority_queue<T, Container, Comparator>&
      priorityQueue_) {
02950     base::workarounds::IterablePriorityQueue<T, Container, Comparator> iterablePriorityQueue_ =
02951       static_cast<base::workarounds::IterablePriorityQueue<T, Container, Comparator>
```

```
    >(priorityQueue_);
02952     return writeIterator(iterablePriorityQueue_.begin(), iterablePriorityQueue_.end(),
    iterablePriorityQueue_.size());
02953   }
02954   template <class First, class Second>
02955   MessageBuilder& operator<<(const std::pair<First, Second>& pair_) {
02956     m_logger->stream() << ELPP_LITERAL("(");
02957     operator << (static_cast<First>(pair_.first));
02958     m_logger->stream() << ELPP_LITERAL(", ");
02959     operator << (static_cast<Second>(pair_.second));
02960     m_logger->stream() << ELPP_LITERAL(")");
02961     return *this;
02962   }
02963   template <std::size_t Size>
02964   MessageBuilder& operator<<(const std::bitset<Size>& bitset_) {
02965     m_logger->stream() << ELPP_LITERAL("[");
02966     operator << (bitset_.to_string());
02967     m_logger->stream() << ELPP_LITERAL("]");
02968     return *this;
02969   }
02970 #  if defined(ELPP_LOG_STD_ARRAY)
02971   template <class T, std::size_t Size>
02972   inline MessageBuilder& operator<<(const std::array<T, Size>& array) {
02973     return writeIterator(array.begin(), array.end(), array.size());
02974   }
02975 #  endif  // defined(ELPP_LOG_STD_ARRAY)
02976 #  if defined(ELPP_LOG_UNORDERED_MAP)
02977   ELPP_ITERATOR_CONTAINER_LOG_FIVE_ARG(std::unordered_map)
02978   ELPP_ITERATOR_CONTAINER_LOG_FIVE_ARG(std::unordered_multimap)
02979 #  endif  // defined(ELPP_LOG_UNORDERED_MAP)
02980 #  if defined(ELPP_LOG_UNORDERED_SET)
02981   ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(std::unordered_set)
02982   ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(std::unordered_multiset)
02983 #  endif  // defined(ELPP_LOG_UNORDERED_SET)
02984 #endif  // defined(ELPP_STL_LOGGING)
02985 #if defined(ELPP_QT_LOGGING)
02986   inline MessageBuilder& operator<<(const QString& msg) {
02987 #  if defined(ELPP_UNICODE)
02988     m_logger->stream() << msg.toStdWString();
02989 #  else
02990     m_logger->stream() << msg.toStdString();
02991 #  endif  // defined(ELPP_UNICODE)
02992     return *this;
02993   }
02994   inline MessageBuilder& operator<<(const QByteArray& msg) {
02995     return operator << (QString(msg));
02996   }
02997   inline MessageBuilder& operator<<(const QStringRef& msg) {
02998     return operator<<(msg.toString());
02999   }
03000   inline MessageBuilder& operator<<(qint64 msg) {
03001 #  if defined(ELPP_UNICODE)
03002     m_logger->stream() << QString::number(msg).toStdWString();
03003 #  else
03004     m_logger->stream() << QString::number(msg).toStdString();
03005 #  endif  // defined(ELPP_UNICODE)
03006     return *this;
03007   }
03008   inline MessageBuilder& operator<<(quint64 msg) {
03009 #  if defined(ELPP_UNICODE)
03010     m_logger->stream() << QString::number(msg).toStdWString();
03011 #  else
03012     m_logger->stream() << QString::number(msg).toStdString();
03013 #  endif  // defined(ELPP_UNICODE)
03014     return *this;
03015   }
03016   inline MessageBuilder& operator<<(QChar msg) {
03017     m_logger->stream() << msg.toLatin1();
03018     return *this;
03019   }
03020   inline MessageBuilder& operator<<(const QLatin1String& msg) {
03021     m_logger->stream() << msg.latin1();
03022     return *this;
03023   }
03024   ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(QList)
03025   ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(QVector)
03026   ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(QQueue)
03027   ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(QSet)
03028   ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(QLinkedList)
03029   ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(QStack)
03030   template <typename First, typename Second>
03031   MessageBuilder& operator<<(const QPair<First, Second>& pair_) {
03032     m_logger->stream() << ELPP_LITERAL("(");
03033     operator << (static_cast<First>(pair_.first));
03034     m_logger->stream() << ELPP_LITERAL(", ");
03035     operator << (static_cast<Second>(pair_.second));
03036     m_logger->stream() << ELPP_LITERAL(")");
```

```
03037     return *this;
03038   }
03039   template <typename K, typename V>
03040   MessageBuilder& operator<<(const QMap<K, V>& map_) {
03041     m_logger->stream() << ELPP_LITERAL("[");
03042     QList<K> keys = map_.keys();
03043     typename QList<K>::const_iterator begin = keys.begin();
03044     typename QList<K>::const_iterator end = keys.end();
03045     int max_ = static_cast<int>(base::consts::kMaxLogPerContainer);  // to prevent warning
03046     for (int index_ = 0; begin != end && index_ < max_; ++index_, ++begin) {
03047       m_logger->stream() << ELPP_LITERAL("(");
03048       operator << (static_cast<K>(*begin));
03049       m_logger->stream() << ELPP_LITERAL(", ");
03050       operator << (static_cast<V>(map_.value(*begin)));
03051       m_logger->stream() << ELPP_LITERAL(")");
03052       m_logger->stream() << ((index_ < keys.size() -1) ? m_containerLogSeparator : ELPP_LITERAL(""));
03053     }
03054     if (begin != end) {
03055       m_logger->stream() << ELPP_LITERAL("...");
03056     }
03057     m_logger->stream() << ELPP_LITERAL("]");
03058     return *this;
03059   }
03060   template <typename K, typename V>
03061   inline MessageBuilder& operator<<(const QMultiMap<K, V>& map_) {
03062     operator << (static_cast<QMap<K, V>>(map_));
03063     return *this;
03064   }
03065   template <typename K, typename V>
03066   MessageBuilder& operator<<(const QHash<K, V>& hash_) {
03067     m_logger->stream() << ELPP_LITERAL("[");
03068     QList<K> keys = hash_.keys();
03069     typename QList<K>::const_iterator begin = keys.begin();
03070     typename QList<K>::const_iterator end = keys.end();
03071     int max_ = static_cast<int>(base::consts::kMaxLogPerContainer);  // prevent type warning
03072     for (int index_ = 0; begin != end && index_ < max_; ++index_, ++begin) {
03073       m_logger->stream() << ELPP_LITERAL("(");
03074       operator << (static_cast<K>(*begin));
03075       m_logger->stream() << ELPP_LITERAL(", ");
03076       operator << (static_cast<V>(hash_.value(*begin)));
03077       m_logger->stream() << ELPP_LITERAL(")");
03078       m_logger->stream() << ((index_ < keys.size() -1) ? m_containerLogSeparator : ELPP_LITERAL(""));
03079     }
03080     if (begin != end) {
03081       m_logger->stream() << ELPP_LITERAL("...");
03082     }
03083     m_logger->stream() << ELPP_LITERAL("]");
03084     return *this;
03085   }
03086   template <typename K, typename V>
03087   inline MessageBuilder& operator<<(const QMultiHash<K, V>& multiHash_) {
03088     operator << (static_cast<QHash<K, V>>(multiHash_));
03089     return *this;
03090   }
03091 #endif  // defined(ELPP_QT_LOGGING)
03092 #if defined(ELPP_BOOST_LOGGING)
03093   ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(boost::container::vector)
03094   ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(boost::container::stable_vector)
03095   ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(boost::container::list)
03096   ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG(boost::container::deque)
03097   ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(boost::container::map)
03098   ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG(boost::container::flat_map)
03099   ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG(boost::container::set)
03100   ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG(boost::container::flat_set)
03101 #endif  // defined(ELPP_BOOST_LOGGING)
03102
03111 #define MAKE_CONTAINERELPP_FRIENDLY(ContainerType, SizeMethod, ElementInstance) \
03112 el::base::type::ostream_t& operator<<(el::base::type::ostream_t& ss, const ContainerType& container) {\
03113 const el::base::type::char_t* sep = ELPP->hasFlag(el::LoggingFlag::NewLineForContainer) ? \
03114 ELPP_LITERAL("\n    ") : ELPP_LITERAL(", ");\
03115 ContainerType::const_iterator elem = container.begin();\
03116 ContainerType::const_iterator endElem = container.end();\
03117 std::size_t size_ = container.SizeMethod; \
03118 ss << ELPP_LITERAL("[");\
03119 for (std::size_t i = 0; elem != endElem && i < el::base::consts::kMaxLogPerContainer; ++i, ++elem) { \
03120 ss << ElementInstance;\
03121 ss << ((i < size_ - 1) ? sep : ELPP_LITERAL(""));\
03122 }\
03123 if (elem != endElem) {\
03124 ss << ELPP_LITERAL("...");\
03125 }\
03126 ss << ELPP_LITERAL("]");\
03127 return ss;\
03128 }
03129 #if defined(ELPP_WXWIDGETS_LOGGING)
03130   ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG(wxVector)
03131 #  define ELPP_WX_PTR_ENABLED(ContainerType) MAKE_CONTAINERELPP_FRIENDLY(ContainerType, size(),
```

```
    *(*elem))
03132 #  define ELPP_WX_ENABLED(ContainerType) MAKE_CONTAINERELPP_FRIENDLY(ContainerType, size(), (*elem))
03133 #  define ELPP_WX_HASH_MAP_ENABLED(ContainerType) MAKE_CONTAINERELPP_FRIENDLY(ContainerType, size(), \
03134 ELPP_LITERAL("(") << elem->first << ELPP_LITERAL(", ") << elem->second << ELPP_LITERAL(")")
03135 #else
03136 #  define ELPP_WX_PTR_ENABLED(ContainerType)
03137 #  define ELPP_WX_ENABLED(ContainerType)
03138 #  define ELPP_WX_HASH_MAP_ENABLED(ContainerType)
03139 #endif  // defined(ELPP_WXWIDGETS_LOGGING)
03140   // Other classes
03141   template <class Class>
03142   ELPP_SIMPLE_LOG(const Class&)
03143 #undef ELPP_SIMPLE_LOG
03144 #undef ELPP_ITERATOR_CONTAINER_LOG_ONE_ARG
03145 #undef ELPP_ITERATOR_CONTAINER_LOG_TWO_ARG
03146 #undef ELPP_ITERATOR_CONTAINER_LOG_THREE_ARG
03147 #undef ELPP_ITERATOR_CONTAINER_LOG_FOUR_ARG
03148 #undef ELPP_ITERATOR_CONTAINER_LOG_FIVE_ARG
03149  private:
03150   Logger* m_logger;
03151   const base::type::char_t* m_containerLogSeparator;
03152
03153   template<class Iterator>
03154   MessageBuilder& writeIterator(Iterator begin_, Iterator end_, std::size_t size_) {
03155     m_logger->stream() << ELPP_LITERAL("[");
03156     for (std::size_t i = 0; begin_ != end_ && i < base::consts::kMaxLogPerContainer; ++i, ++begin_) {
03157       operator << (*begin_);
03158       m_logger->stream() << ((i < size_ - 1) ? m_containerLogSeparator : ELPP_LITERAL(""));
03159     }
03160     if (begin_ != end_) {
03161       m_logger->stream() << ELPP_LITERAL("...");
03162     }
03163     m_logger->stream() << ELPP_LITERAL("]");
03164     if (ELPP->hasFlag(LoggingFlag::AutoSpacing)) {
03165       m_logger->stream() << " ";
03166     }
03167     return *this;
03168   }
03169 };
03171 class NullWriter : base::NoCopy {
03172  public:
03173   NullWriter(void) {}
03174
03175   // Null manipulator
03176   inline NullWriter& operator<<(std::ostream& (*)(std::ostream&)) {
03177     return *this;
03178   }
03179
03180   template <typename T>
03181   inline NullWriter& operator<<(const T&) {
03182     return *this;
03183   }
03184
03185   inline operator bool() {
03186     return true;
03187   }
03188 };
03190 class Writer : base::NoCopy {
03191  public:
03192   Writer(Level level, const char* file, base::type::LineNumber line,
03193          const char* func, base::DispatchAction dispatchAction = base::DispatchAction::NormalLog,
03194          base::type::VerboseLevel verboseLevel = 0) :
03195     m_msg(nullptr), m_level(level), m_file(file), m_line(line), m_func(func),
    m_verboseLevel(verboseLevel),
03196     m_logger(nullptr), m_proceed(false), m_dispatchAction(dispatchAction) {
03197   }
03198
03199   Writer(LogMessage* msg, base::DispatchAction dispatchAction = base::DispatchAction::NormalLog) :
03200     m_msg(msg), m_level(msg != nullptr ? msg->level() : Level::Unknown),
03201     m_line(0), m_logger(nullptr), m_proceed(false), m_dispatchAction(dispatchAction) {
03202   }
03203
03204   virtual ~Writer(void) {
03205     processDispatch();
03206   }
03207
03208   template <typename T>
03209   inline Writer& operator<<(const T& log) {
03210 #if ELPP_LOGGING_ENABLED
03211     if (m_proceed) {
03212       m_messageBuilder << log;
03213     }
03214 #endif  // ELPP_LOGGING_ENABLED
03215     return *this;
03216   }
03217
03218   inline Writer& operator<<(std::ostream& (*log)(std::ostream&)) {
```

```
03219 #if ELPP_LOGGING_ENABLED
03220     if (m_proceed) {
03221       m_messageBuilder « log;
03222     }
03223 #endif  // ELPP_LOGGING_ENABLED
03224     return *this;
03225   }
03226
03227   inline operator bool() {
03228     return true;
03229   }
03230
03231   Writer& construct(Logger* logger, bool needLock = true);
03232   Writer& construct(int count, const char* loggerIds, ...);
03233  protected:
03234   LogMessage* m_msg;
03235   Level m_level;
03236   const char* m_file;
03237   const base::type::LineNumber m_line;
03238   const char* m_func;
03239   base::type::VerboseLevel m_verboseLevel;
03240   Logger* m_logger;
03241   bool m_proceed;
03242   base::MessageBuilder m_messageBuilder;
03243   base::DispatchAction m_dispatchAction;
03244   std::vector<std::string> m_loggerIds;
03245   friend class el::Helpers;
03246
03247   void initializeLogger(const std::string& loggerId, bool lookup = true, bool needLock = true);
03248   void processDispatch();
03249   void triggerDispatch(void);
03250 };
03251 class PErrorWriter : public base::Writer {
03252  public:
03253   PErrorWriter(Level level, const char* file, base::type::LineNumber line,
03254                const char* func, base::DispatchAction dispatchAction =
      base::DispatchAction::NormalLog,
03255                base::type::VerboseLevel verboseLevel = 0) :
03256     base::Writer(level, file, line, func, dispatchAction, verboseLevel) {
03257   }
03258
03259   virtual ~PErrorWriter(void);
03260 };
03261 }  // namespace base
03262 // Logging from Logger class. Why this is here? Because we have Storage and Writer class available
03263 #if ELPP_VARIADIC_TEMPLATES_SUPPORTED
03264 template <typename T, typename... Args>
03265 void Logger::log_(Level level, int vlevel, const char* s, const T& value, const Args&... args) {
03266   base::MessageBuilder b;
03267   b.initialize(this);
03268   while (*s) {
03269     if (*s == base::consts::kFormatSpecifierChar) {
03270       if (*(s + 1) == base::consts::kFormatSpecifierChar) {
03271         ++s;
03272       } else {
03273         if (*(s + 1) == base::consts::kFormatSpecifierCharValue) {
03274           ++s;
03275           b « value;
03276           log_(level, vlevel, ++s, args...);
03277           return;
03278         }
03279       }
03280     }
03281     b « *s++;
03282   }
03283   ELPP_INTERNAL_ERROR("Too many arguments provided. Unable to handle. Please provide more format
      specifiers", false);
03284 }
03285 template <typename T>
03286 void Logger::log_(Level level, int vlevel, const T& log) {
03287   if (level == Level::Verbose) {
03288     if (ELPP->vRegistry()->allowed(vlevel, __FILE__)) {
03289       base::Writer(Level::Verbose, "FILE", 0, "FUNCTION",
03290                    base::DispatchAction::NormalLog, vlevel).construct(this, false) « log;
03291     } else {
03292       stream().str(ELPP_LITERAL(""));
03293       releaseLock();
03294     }
03295   } else {
03296     base::Writer(level, "FILE", 0, "FUNCTION").construct(this, false) « log;
03297   }
03298 }
03299 template <typename T, typename... Args>
03300 inline void Logger::log(Level level, const char* s, const T& value, const Args&... args) {
03301   acquireLock(); // released in Writer!
03302   log_(level, 0, s, value, args...);
03303 }
```

```
03304 template <typename T>
03305 inline void Logger::log(Level level, const T& log) {
03306   acquireLock(); // released in Writer!
03307   log_(level, 0, log);
03308 }
03309 #  if ELPP_VERBOSE_LOG
03310 template <typename T, typename... Args>
03311 inline void Logger::verbose(int vlevel, const char* s, const T& value, const Args&... args) {
03312   acquireLock(); // released in Writer!
03313   log_(el::Level::Verbose, vlevel, s, value, args...);
03314 }
03315 template <typename T>
03316 inline void Logger::verbose(int vlevel, const T& log) {
03317   acquireLock(); // released in Writer!
03318   log_(el::Level::Verbose, vlevel, log);
03319 }
03320 #  else
03321 template <typename T, typename... Args>
03322 inline void Logger::verbose(int, const char*, const T&, const Args&...) {
03323   return;
03324 }
03325 template <typename T>
03326 inline void Logger::verbose(int, const T&) {
03327   return;
03328 }
03329 #  endif  // ELPP_VERBOSE_LOG
03330 #  define LOGGER_LEVEL_WRITERS(FUNCTION_NAME, LOG_LEVEL)\
03331 template <typename T, typename... Args>\
03332 inline void Logger::FUNCTION_NAME(const char* s, const T& value, const Args&... args) {\
03333 log(LOG_LEVEL, s, value, args...);\
03334 }\
03335 template <typename T>\
03336 inline void Logger::FUNCTION_NAME(const T& value) {\
03337 log(LOG_LEVEL, value);\
03338 }
03339 #  define LOGGER_LEVEL_WRITERS_DISABLED(FUNCTION_NAME, LOG_LEVEL)\
03340 template <typename T, typename... Args>\
03341 inline void Logger::FUNCTION_NAME(const char*, const T&, const Args&...) {\
03342 return;\
03343 }\
03344 template <typename T>\
03345 inline void Logger::FUNCTION_NAME(const T&) {\
03346 return;\
03347 }
03348
03349 #  if ELPP_INFO_LOG
03350 LOGGER_LEVEL_WRITERS(info, Level::Info)
03351 #  else
03352 LOGGER_LEVEL_WRITERS_DISABLED(info, Level::Info)
03353 #  endif // ELPP_INFO_LOG
03354 #  if ELPP_DEBUG_LOG
03355 LOGGER_LEVEL_WRITERS(debug, Level::Debug)
03356 #  else
03357 LOGGER_LEVEL_WRITERS_DISABLED(debug, Level::Debug)
03358 #  endif // ELPP_DEBUG_LOG
03359 #  if ELPP_WARNING_LOG
03360 LOGGER_LEVEL_WRITERS(warn, Level::Warning)
03361 #  else
03362 LOGGER_LEVEL_WRITERS_DISABLED(warn, Level::Warning)
03363 #  endif // ELPP_WARNING_LOG
03364 #  if ELPP_ERROR_LOG
03365 LOGGER_LEVEL_WRITERS(error, Level::Error)
03366 #  else
03367 LOGGER_LEVEL_WRITERS_DISABLED(error, Level::Error)
03368 #  endif // ELPP_ERROR_LOG
03369 #  if ELPP_FATAL_LOG
03370 LOGGER_LEVEL_WRITERS(fatal, Level::Fatal)
03371 #  else
03372 LOGGER_LEVEL_WRITERS_DISABLED(fatal, Level::Fatal)
03373 #  endif // ELPP_FATAL_LOG
03374 #  if ELPP_TRACE_LOG
03375 LOGGER_LEVEL_WRITERS(trace, Level::Trace)
03376 #  else
03377 LOGGER_LEVEL_WRITERS_DISABLED(trace, Level::Trace)
03378 #  endif // ELPP_TRACE_LOG
03379 #  undef LOGGER_LEVEL_WRITERS
03380 #  undef LOGGER_LEVEL_WRITERS_DISABLED
03381 #endif // ELPP_VARIADIC_TEMPLATES_SUPPORTED
03382 #if ELPP_COMPILER_MSVC
03383 #  define ELPP_VARIADIC_FUNC_MSVC(variadicFunction, variadicArgs) variadicFunction variadicArgs
03384 #  define ELPP_VARIADIC_FUNC_MSVC_RUN(variadicFunction, ...) ELPP_VARIADIC_FUNC_MSVC(variadicFunction,
    (__VA_ARGS__))
03385 #  define el_getVALength(...) ELPP_VARIADIC_FUNC_MSVC_RUN(el_resolveVALength, 0, ## __VA_ARGS__,\
03386 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0)
03387 #else
03388 #  if ELPP_COMPILER_CLANG
03389 #    define el_getVALength(...) el_resolveVALength(0, __VA_ARGS__, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0)
```

```
03390 #  else
03391 #    define el_getVALength(...) el_resolveVALength(0, ## __VA_ARGS__, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1,
      0)
03392 #  endif // ELPP_COMPILER_CLANG
03393 #endif // ELPP_COMPILER_MSVC
03394 #define el_resolveVALength(_0, _1, _2, _3, _4, _5, _6, _7, _8, _9, _10, N, ...) N
03395 #define ELPP_WRITE_LOG(writer, level, dispatchAction, ...) \
03396 writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
03397 #define ELPP_WRITE_LOG_IF(writer, condition, level, dispatchAction, ...) if (condition) \
03398 writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
03399 #define ELPP_WRITE_LOG_EVERY_N(writer, occasion, level, dispatchAction, ...) \
03400 ELPP->validateEveryNCounter(__FILE__, __LINE__, occasion) && \
03401 writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
03402 #define ELPP_WRITE_LOG_AFTER_N(writer, n, level, dispatchAction, ...) \
03403 ELPP->validateAfterNCounter(__FILE__, __LINE__, n) && \
03404 writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
03405 #define ELPP_WRITE_LOG_N_TIMES(writer, n, level, dispatchAction, ...) \
03406 ELPP->validateNTimesCounter(__FILE__, __LINE__, n) && \
03407 writer(level, __FILE__, __LINE__, ELPP_FUNC, dispatchAction).construct(el_getVALength(__VA_ARGS__),
      __VA_ARGS__)
03408 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
03409 class PerformanceTrackingData {
03410  public:
03411   enum class DataType : base::type::EnumType {
03412     Checkpoint = 1, Complete = 2
03413   };
03414   // Do not use constructor, will run into multiple definition error, use init(PerformanceTracker*)
03415   explicit PerformanceTrackingData(DataType dataType) : m_performanceTracker(nullptr),
03416     m_dataType(dataType), m_firstCheckpoint(false), m_file(""), m_line(0), m_func("") {}
03417   inline const std::string* blockName(void) const;
03418   inline const struct timeval* startTime(void) const;
03419   inline const struct timeval* endTime(void) const;
03420   inline const struct timeval* lastCheckpointTime(void) const;
03421   inline const base::PerformanceTracker* performanceTracker(void) const {
03422     return m_performanceTracker;
03423   }
03424   inline PerformanceTrackingData::DataType dataType(void) const {
03425     return m_dataType;
03426   }
03427   inline bool firstCheckpoint(void) const {
03428     return m_firstCheckpoint;
03429   }
03430   inline std::string checkpointId(void) const {
03431     return m_checkpointId;
03432   }
03433   inline const char* file(void) const {
03434     return m_file;
03435   }
03436   inline base::type::LineNumber line(void) const {
03437     return m_line;
03438   }
03439   inline const char* func(void) const {
03440     return m_func;
03441   }
03442   inline const base::type::string_t* formattedTimeTaken() const {
03443     return &m_formattedTimeTaken;
03444   }
03445   inline const std::string& loggerId(void) const;
03446  private:
03447   base::PerformanceTracker* m_performanceTracker;
03448   base::type::string_t m_formattedTimeTaken;
03449   PerformanceTrackingData::DataType m_dataType;
03450   bool m_firstCheckpoint;
03451   std::string m_checkpointId;
03452   const char* m_file;
03453   base::type::LineNumber m_line;
03454   const char* m_func;
03455   inline void init(base::PerformanceTracker* performanceTracker, bool firstCheckpoint = false) {
03456     m_performanceTracker = performanceTracker;
03457     m_firstCheckpoint = firstCheckpoint;
03458   }
03459
03460   friend class el::base::PerformanceTracker;
03461 };
03462 namespace base {
03465 class PerformanceTracker : public base::threading::ThreadSafe, public Loggable {
03466  public:
03467   PerformanceTracker(const std::string& blockName,
03468                      base::TimestampUnit timestampUnit = base::TimestampUnit::Millisecond,
03469                      const std::string& loggerId =
      std::string(el::base::consts::kPerformanceLoggerId),
03470                      bool scopedLog = true, Level level =
      base::consts::kPerformanceTrackerDefaultLevel);
```

```
03472   PerformanceTracker(const PerformanceTracker& t) :
03473     m_blockName(t.m_blockName), m_timestampUnit(t.m_timestampUnit), m_loggerId(t.m_loggerId),
      m_scopedLog(t.m_scopedLog),
03474     m_level(t.m_level), m_hasChecked(t.m_hasChecked), m_lastCheckpointId(t.m_lastCheckpointId),
      m_enabled(t.m_enabled),
03475     m_startTime(t.m_startTime), m_endTime(t.m_endTime), m_lastCheckpointTime(t.m_lastCheckpointTime) {
03476   }
03477   virtual ~PerformanceTracker(void);
03479   void checkpoint(const std::string& id = std::string(), const char* file = __FILE__,
03480                   base::type::LineNumber line = __LINE__,
03481                   const char* func = "");
03482   inline Level level(void) const {
03483     return m_level;
03484   }
03485  private:
03486   std::string m_blockName;
03487   base::TimestampUnit m_timestampUnit;
03488   std::string m_loggerId;
03489   bool m_scopedLog;
03490   Level m_level;
03491   bool m_hasChecked;
03492   std::string m_lastCheckpointId;
03493   bool m_enabled;
03494   struct timeval m_startTime, m_endTime, m_lastCheckpointTime;
03495
03496   PerformanceTracker(void);
03497
03498   friend class el::PerformanceTrackingData;
03499   friend class base::DefaultPerformanceTrackingCallback;
03500
03501   const inline base::type::string_t getFormattedTimeTaken() const {
03502     return getFormattedTimeTaken(m_startTime);
03503   }
03504
03505   const base::type::string_t getFormattedTimeTaken(struct timeval startTime) const;
03506
03507   virtual inline void log(el::base::type::ostream_t& os) const {
03508     os « getFormattedTimeTaken();
03509   }
03510 };
03511 class DefaultPerformanceTrackingCallback : public PerformanceTrackingCallback {
03512  protected:
03513   void handle(const PerformanceTrackingData* data) {
03514     m_data = data;
03515     base::type::stringstream_t ss;
03516     if (m_data->dataType() == PerformanceTrackingData::DataType::Complete) {
03517       ss « ELPP_LITERAL("Executed [") « m_data->blockName()->c_str() « ELPP_LITERAL("] in [") «
03518          *m_data->formattedTimeTaken() « ELPP_LITERAL("]");
03519     } else {
03520       ss « ELPP_LITERAL("Performance checkpoint");
03521       if (!m_data->checkpointId().empty()) {
03522         ss « ELPP_LITERAL(" [") « m_data->checkpointId().c_str() « ELPP_LITERAL("]");
03523       }
03524       ss « ELPP_LITERAL(" for block [") « m_data->blockName()->c_str() « ELPP_LITERAL("] : [") «
03525          *m_data->performanceTracker();
03526       if (!ELPP->hasFlag(LoggingFlag::DisablePerformanceTrackingCheckpointComparison)
03527           && m_data->performanceTracker()->m_hasChecked) {
03528         ss « ELPP_LITERAL(" ([") « *m_data->formattedTimeTaken() « ELPP_LITERAL("] from ");
03529         if (m_data->performanceTracker()->m_lastCheckpointId.empty()) {
03530           ss « ELPP_LITERAL("last checkpoint");
03531         } else {
03532           ss « ELPP_LITERAL("checkpoint '") « m_data->performanceTracker()->m_lastCheckpointId.c_str()
      « ELPP_LITERAL("'");
03533         }
03534         ss « ELPP_LITERAL(")]");
03535       } else {
03536         ss « ELPP_LITERAL("]");
03537       }
03538     }
03539     el::base::Writer(m_data->performanceTracker()->level(), m_data->file(), m_data->line(),
      m_data->func()).construct(1,
03540         m_data->loggerId().c_str()) « ss.str();
03541   }
03542  private:
03543   const PerformanceTrackingData* m_data;
03544 };
03545 }  // namespace base
03546 inline const std::string* PerformanceTrackingData::blockName() const {
03547   return const_cast<const std::string*>(&m_performanceTracker->m_blockName);
03548 }
03549 inline const struct timeval* PerformanceTrackingData::startTime() const {
03550   return const_cast<const struct timeval*>(&m_performanceTracker->m_startTime);
03551 }
03552 inline const struct timeval* PerformanceTrackingData::endTime() const {
03553   return const_cast<const struct timeval*>(&m_performanceTracker->m_endTime);
03554 }
03555 inline const struct timeval* PerformanceTrackingData::lastCheckpointTime() const {
```

```
03556   return const_cast<const struct timeval*>(&m_performanceTracker->m_lastCheckpointTime);
03557 }
03558 inline const std::string& PerformanceTrackingData::loggerId(void) const {
03559   return m_performanceTracker->m_loggerId;
03560 }
03561 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
03562 namespace base {
03564 namespace debug {
03565 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_CRASH_LOG)
03566 class StackTrace : base::NoCopy {
03567  public:
03568   static const unsigned int kMaxStack = 64;
03569   static const unsigned int kStackStart = 2;  // We want to skip c'tor and StackTrace::generateNew()
03570   class StackTraceEntry {
03571    public:
03572     StackTraceEntry(std::size_t index, const std::string& loc, const std::string& demang, const
      std::string& hex,
03573                     const std::string& addr);
03574     StackTraceEntry(std::size_t index, const std::string& loc) :
03575       m_index(index),
03576       m_location(loc) {
03577     }
03578     std::size_t m_index;
03579     std::string m_location;
03580     std::string m_demangled;
03581     std::string m_hex;
03582     std::string m_addr;
03583     friend std::ostream& operator<<(std::ostream& ss, const StackTraceEntry& si);
03584
03585    private:
03586     StackTraceEntry(void);
03587   };
03588
03589   StackTrace(void) {
03590     generateNew();
03591   }
03592
03593   virtual ~StackTrace(void) {
03594   }
03595
03596   inline std::vector<StackTraceEntry>& getLatestStack(void) {
03597     return m_stack;
03598   }
03599
03600   friend std::ostream& operator<<(std::ostream& os, const StackTrace& st);
03601
03602  private:
03603   std::vector<StackTraceEntry> m_stack;
03604
03605   void generateNew(void);
03606 };
03608 class CrashHandler : base::NoCopy {
03609  public:
03610   typedef void (*Handler)(int);
03611
03612   explicit CrashHandler(bool useDefault);
03613   explicit CrashHandler(const Handler& cHandler) {
03614     setHandler(cHandler);
03615   }
03616   void setHandler(const Handler& cHandler);
03617
03618  private:
03619   Handler m_handler;
03620 };
03621 #else
03622 class CrashHandler {
03623  public:
03624   explicit CrashHandler(bool) {}
03625 };
03626 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_CRASH_LOG)
03627 }  // namespace debug
03628 }  // namespace base
03629 extern base::debug::CrashHandler elCrashHandler;
03630 #define MAKE_LOGGABLE(ClassType, ClassInstance, OutputStreamInstance) \
03631 el::base::type::ostream_t& operator<<(el::base::type::ostream_t& OutputStreamInstance, const ClassType&
      ClassInstance)
03633 class SysLogInitializer {
03634  public:
03635   SysLogInitializer(const char* processIdent, int options = 0, int facility = 0) {
03636 #if defined(ELPP_SYSLOG)
03637     (void)base::consts::kSysLogLoggerId;
03638     openlog(processIdent, options, facility);
03639 #else
03640     ELPP_UNUSED(processIdent);
03641     ELPP_UNUSED(options);
03642     ELPP_UNUSED(facility);
03643 #endif  // defined(ELPP_SYSLOG)
```

```
03644   }
03645   virtual ~SysLogInitializer(void) {
03646 #if defined(ELPP_SYSLOG)
03647     closelog();
03648 #endif  // defined(ELPP_SYSLOG)
03649   }
03650 };
03651 #define ELPP_INITIALIZE_SYSLOG(id, opt, fac) el::SysLogInitializer elSyslogInit(id, opt, fac)
03653 class Helpers : base::StaticClass {
03654  public:
03656   static inline void setStorage(base::type::StoragePointer storage) {
03657     ELPP = storage;
03658   }
03660   static inline base::type::StoragePointer storage() {
03661     return ELPP;
03662   }
03664   static inline void setArgs(int argc, char** argv) {
03665     ELPP->setApplicationArguments(argc, argv);
03666   }
03668   static inline void setArgs(int argc, const char** argv) {
03669     ELPP->setApplicationArguments(argc, const_cast<char**>(argv));
03670   }
03672   static inline void setThreadName(const std::string& name) {
03673     ELPP->setThreadName(name);
03674   }
03675   static inline std::string getThreadName() {
03676     return ELPP->getThreadName(base::threading::getCurrentThreadId());
03677   }
03678 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_CRASH_LOG)
03682   static inline void setCrashHandler(const el::base::debug::CrashHandler::Handler& crashHandler) {
03683     el::elCrashHandler.setHandler(crashHandler);
03684   }
03687   static void crashAbort(int sig, const char* sourceFile = "", unsigned int long line = 0);
03693   static void logCrashReason(int sig, bool stackTraceIfAvailable = false,
03694                              Level level = Level::Fatal, const char* logger =
    base::consts::kDefaultLoggerId);
03695 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_CRASH_LOG)
03698   static inline void installPreRollOutCallback(const PreRollOutCallback& callback) {
03699     ELPP->setPreRollOutCallback(callback);
03700   }
03702   static inline void uninstallPreRollOutCallback(void) {
03703     ELPP->unsetPreRollOutCallback();
03704   }
03706   template <typename T>
03707   static inline bool installLogDispatchCallback(const std::string& id) {
03708     return ELPP->installLogDispatchCallback<T>(id);
03709   }
03711   template <typename T>
03712   static inline void uninstallLogDispatchCallback(const std::string& id) {
03713     ELPP->uninstallLogDispatchCallback<T>(id);
03714   }
03715   template <typename T>
03716   static inline T* logDispatchCallback(const std::string& id) {
03717     return ELPP->logDispatchCallback<T>(id);
03718   }
03719 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
03721   template <typename T>
03722   static inline bool installPerformanceTrackingCallback(const std::string& id) {
03723     return ELPP->installPerformanceTrackingCallback<T>(id);
03724   }
03726   template <typename T>
03727   static inline void uninstallPerformanceTrackingCallback(const std::string& id) {
03728     ELPP->uninstallPerformanceTrackingCallback<T>(id);
03729   }
03730   template <typename T>
03731   static inline T* performanceTrackingCallback(const std::string& id) {
03732     return ELPP->performanceTrackingCallback<T>(id);
03733   }
03734 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
03736   template <typename T>
03737   static std::string convertTemplateToStdString(const T& templ) {
03738     el::Logger* logger =
03739       ELPP->registeredLoggers()->get(el::base::consts::kDefaultLoggerId);
03740     if (logger == nullptr) {
03741       return std::string();
03742     }
03743     base::MessageBuilder b;
03744     b.initialize(logger);
03745     logger->acquireLock();
03746     b << templ;
03747 #if defined(ELPP_UNICODE)
03748     std::string s = std::string(logger->stream().str().begin(), logger->stream().str().end());
03749 #else
03750     std::string s = logger->stream().str();
03751 #endif  // defined(ELPP_UNICODE)
03752     logger->stream().str(ELPP_LITERAL(""));
03753     logger->releaseLock();
```

```
03754     return s;
03755   }
03757   static inline const el::base::utils::CommandLineArgs* commandLineArgs(void) {
03758     return ELPP->commandLineArgs();
03759   }
03762   static inline void reserveCustomFormatSpecifiers(std::size_t size) {
03763     ELPP->m_customFormatSpecifiers.reserve(size);
03764   }
03766   static inline void installCustomFormatSpecifier(const CustomFormatSpecifier& customFormatSpecifier)
      {
03767     ELPP->installCustomFormatSpecifier(customFormatSpecifier);
03768   }
03770   static inline bool uninstallCustomFormatSpecifier(const char* formatSpecifier) {
03771     return ELPP->uninstallCustomFormatSpecifier(formatSpecifier);
03772   }
03774   static inline bool hasCustomFormatSpecifier(const char* formatSpecifier) {
03775     return ELPP->hasCustomFormatSpecifier(formatSpecifier);
03776   }
03777   static inline void validateFileRolling(Logger* logger, Level level) {
03778     if (ELPP == nullptr || logger == nullptr) return;
03779     logger->m_typedConfigurations->validateFileRolling(level, ELPP->preRollOutCallback());
03780   }
03781 };
03783 class Loggers : base::StaticClass {
03784  public:
03786   static Logger* getLogger(const std::string& identity, bool registerIfNotAvailable = true);
03788   static void setDefaultLogBuilder(el::LogBuilderPtr& logBuilderPtr);
03790   template <typename T>
03791   static inline bool installLoggerRegistrationCallback(const std::string& id) {
03792     return ELPP->registeredLoggers()->installLoggerRegistrationCallback<T>(id);
03793   }
03795   template <typename T>
03796   static inline void uninstallLoggerRegistrationCallback(const std::string& id) {
03797     ELPP->registeredLoggers()->uninstallLoggerRegistrationCallback<T>(id);
03798   }
03799   template <typename T>
03800   static inline T* loggerRegistrationCallback(const std::string& id) {
03801     return ELPP->registeredLoggers()->loggerRegistrationCallback<T>(id);
03802   }
03805   static bool unregisterLogger(const std::string& identity);
03807   static bool hasLogger(const std::string& identity);
03809   static Logger* reconfigureLogger(Logger* logger, const Configurations& configurations);
03811   static Logger* reconfigureLogger(const std::string& identity, const Configurations& configurations);
03813   static Logger* reconfigureLogger(const std::string& identity, ConfigurationType configurationType,
03814                                    const std::string& value);
03816   static void reconfigureAllLoggers(const Configurations& configurations);
03818   static inline void reconfigureAllLoggers(ConfigurationType configurationType, const std::string&
      value) {
03819     reconfigureAllLoggers(Level::Global, configurationType, value);
03820   }
03822   static void reconfigureAllLoggers(Level level, ConfigurationType configurationType,
03823                                     const std::string& value);
03825   static void setDefaultConfigurations(const Configurations& configurations,
03826                                        bool reconfigureExistingLoggers = false);
03828   static const Configurations* defaultConfigurations(void);
03830   static const base::LogStreamsReferenceMapPtr logStreamsReference(void);
03832   static base::TypedConfigurations defaultTypedConfigurations(void);
03835   static std::vector<std::string>* populateAllLoggerIds(std::vector<std::string>* targetList);
03837   static void configureFromGlobal(const char* globalConfigurationFilePath);
03842   static bool configureFromArg(const char* argKey);
03844   static void flushAll(void);
03846   static inline void addFlag(LoggingFlag flag) {
03847     ELPP->addFlag(flag);
03848   }
03850   static inline void removeFlag(LoggingFlag flag) {
03851     ELPP->removeFlag(flag);
03852   }
03854   static inline bool hasFlag(LoggingFlag flag) {
03855     return ELPP->hasFlag(flag);
03856   }
03858   class ScopedAddFlag {
03859    public:
03860     ScopedAddFlag(LoggingFlag flag) : m_flag(flag) {
03861       Loggers::addFlag(m_flag);
03862     }
03863     ~ScopedAddFlag(void) {
03864       Loggers::removeFlag(m_flag);
03865     }
03866    private:
03867     LoggingFlag m_flag;
03868   };
03870   class ScopedRemoveFlag {
03871    public:
03872     ScopedRemoveFlag(LoggingFlag flag) : m_flag(flag) {
03873       Loggers::removeFlag(m_flag);
03874     }
03875     ~ScopedRemoveFlag(void) {
```

```
03876       Loggers::addFlag(m_flag);
03877     }
03878    private:
03879     LoggingFlag m_flag;
03880   };
03882   static void setLoggingLevel(Level level) {
03883     ELPP->setLoggingLevel(level);
03884   }
03886   static void setVerboseLevel(base::type::VerboseLevel level);
03888   static base::type::VerboseLevel verboseLevel(void);
03890   static void setVModules(const char* modules);
03892   static void clearVModules(void);
03893 };
03894 class VersionInfo : base::StaticClass {
03895  public:
03897   static const std::string version(void);
03898
03900   static const std::string releaseDate(void);
03901 };
03902 }  // namespace el
03903 #undef VLOG_IS_ON
03905 #define VLOG_IS_ON(verboseLevel) (ELPP->vRegistry()->allowed(verboseLevel, __FILE__))
03906 #undef TIMED_BLOCK
03907 #undef TIMED_SCOPE
03908 #undef TIMED_SCOPE_IF
03909 #undef TIMED_FUNC
03910 #undef TIMED_FUNC_IF
03911 #undef ELPP_MIN_UNIT
03912 #if defined(ELPP_PERFORMANCE_MICROSECONDS)
03913 #  define ELPP_MIN_UNIT el::base::TimestampUnit::Microsecond
03914 #else
03915 #  define ELPP_MIN_UNIT el::base::TimestampUnit::Millisecond
03916 #endif  // (defined(ELPP_PERFORMANCE_MICROSECONDS))
03923 // Note: Do not surround this definition with null macro because of obj instance
03924 #define TIMED_SCOPE_IF(obj, blockname, condition) el::base::type::PerformanceTrackerPtr obj( condition
      ? \
03925   new el::base::PerformanceTracker(blockname, ELPP_MIN_UNIT) : nullptr )
03926 #define TIMED_SCOPE(obj, blockname) TIMED_SCOPE_IF(obj, blockname, true)
03927 #define TIMED_BLOCK(obj, blockName) for (struct { int i; el::base::type::PerformanceTrackerPtr timer;
      } obj = { 0, \
03928   el::base::type::PerformanceTrackerPtr(new el::base::PerformanceTracker(blockName, ELPP_MIN_UNIT)) };
      obj.i < 1; ++obj.i)
03935 #define TIMED_FUNC_IF(obj,condition) TIMED_SCOPE_IF(obj, ELPP_FUNC, condition)
03936 #define TIMED_FUNC(obj) TIMED_SCOPE(obj, ELPP_FUNC)
03937 #undef PERFORMANCE_CHECKPOINT
03938 #undef PERFORMANCE_CHECKPOINT_WITH_ID
03939 #define PERFORMANCE_CHECKPOINT(obj) obj->checkpoint(std::string(), __FILE__, __LINE__, ELPP_FUNC)
03940 #define PERFORMANCE_CHECKPOINT_WITH_ID(obj, id) obj->checkpoint(id, __FILE__, __LINE__, ELPP_FUNC)
03941 #undef ELPP_COUNTER
03942 #undef ELPP_COUNTER_POS
03944 #define ELPP_COUNTER (ELPP->hitCounters()->getCounter(__FILE__, __LINE__))
03946 #define ELPP_COUNTER_POS (ELPP_COUNTER == nullptr ? -1 : ELPP_COUNTER->hitCounts())
03947 // Undef levels to support LOG(LEVEL)
03948 #undef INFO
03949 #undef WARNING
03950 #undef DEBUG
03951 #undef ERROR
03952 #undef FATAL
03953 #undef TRACE
03954 #undef VERBOSE
03955 // Undef existing
03956 #undef CINFO
03957 #undef CWARNING
03958 #undef CDEBUG
03959 #undef CFATAL
03960 #undef CERROR
03961 #undef CTRACE
03962 #undef CVERBOSE
03963 #undef CINFO_IF
03964 #undef CWARNING_IF
03965 #undef CDEBUG_IF
03966 #undef CERROR_IF
03967 #undef CFATAL_IF
03968 #undef CTRACE_IF
03969 #undef CVERBOSE_IF
03970 #undef CINFO_EVERY_N
03971 #undef CWARNING_EVERY_N
03972 #undef CDEBUG_EVERY_N
03973 #undef CERROR_EVERY_N
03974 #undef CFATAL_EVERY_N
03975 #undef CTRACE_EVERY_N
03976 #undef CVERBOSE_EVERY_N
03977 #undef CINFO_AFTER_N
03978 #undef CWARNING_AFTER_N
03979 #undef CDEBUG_AFTER_N
03980 #undef CERROR_AFTER_N
03981 #undef CFATAL_AFTER_N
```

```
03982 #undef CTRACE_AFTER_N
03983 #undef CVERBOSE_AFTER_N
03984 #undef CINFO_N_TIMES
03985 #undef CWARNING_N_TIMES
03986 #undef CDEBUG_N_TIMES
03987 #undef CERROR_N_TIMES
03988 #undef CFATAL_N_TIMES
03989 #undef CTRACE_N_TIMES
03990 #undef CVERBOSE_N_TIMES
03991 // Normal logs
03992 #if ELPP_INFO_LOG
03993 #  define CINFO(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Info, dispatchAction,
      __VA_ARGS__)
03994 #else
03995 #  define CINFO(writer, dispatchAction, ...) el::base::NullWriter()
03996 #endif  // ELPP_INFO_LOG
03997 #if ELPP_WARNING_LOG
03998 #  define CWARNING(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Warning,
      dispatchAction, __VA_ARGS__)
03999 #else
04000 #  define CWARNING(writer, dispatchAction, ...) el::base::NullWriter()
04001 #endif  // ELPP_WARNING_LOG
04002 #if ELPP_DEBUG_LOG
04003 #  define CDEBUG(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Debug, dispatchAction,
      __VA_ARGS__)
04004 #else
04005 #  define CDEBUG(writer, dispatchAction, ...) el::base::NullWriter()
04006 #endif  // ELPP_DEBUG_LOG
04007 #if ELPP_ERROR_LOG
04008 #  define CERROR(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Error, dispatchAction,
      __VA_ARGS__)
04009 #else
04010 #  define CERROR(writer, dispatchAction, ...) el::base::NullWriter()
04011 #endif  // ELPP_ERROR_LOG
04012 #if ELPP_FATAL_LOG
04013 #  define CFATAL(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Fatal, dispatchAction,
      __VA_ARGS__)
04014 #else
04015 #  define CFATAL(writer, dispatchAction, ...) el::base::NullWriter()
04016 #endif  // ELPP_FATAL_LOG
04017 #if ELPP_TRACE_LOG
04018 #  define CTRACE(writer, dispatchAction, ...) ELPP_WRITE_LOG(writer, el::Level::Trace, dispatchAction,
      __VA_ARGS__)
04019 #else
04020 #  define CTRACE(writer, dispatchAction, ...) el::base::NullWriter()
04021 #endif  // ELPP_TRACE_LOG
04022 #if ELPP_VERBOSE_LOG
04023 #  define CVERBOSE(writer, vlevel, dispatchAction, ...) if (VLOG_IS_ON(vlevel)) writer(\
04024 el::Level::Verbose, __FILE__, __LINE__, ELPP_FUNC, dispatchAction,
      vlevel).construct(el_getVALength(__VA_ARGS__), __VA_ARGS__)
04025 #else
04026 #  define CVERBOSE(writer, vlevel, dispatchAction, ...) el::base::NullWriter()
04027 #endif  // ELPP_VERBOSE_LOG
04028 // Conditional logs
04029 #if ELPP_INFO_LOG
04030 #  define CINFO_IF(writer, condition_, dispatchAction, ...) \
04031 ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Info, dispatchAction, __VA_ARGS__)
04032 #else
04033 #  define CINFO_IF(writer, condition_, dispatchAction, ...) el::base::NullWriter()
04034 #endif  // ELPP_INFO_LOG
04035 #if ELPP_WARNING_LOG
04036 #  define CWARNING_IF(writer, condition_, dispatchAction, ...)\
04037 ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Warning, dispatchAction, __VA_ARGS__)
04038 #else
04039 #  define CWARNING_IF(writer, condition_, dispatchAction, ...) el::base::NullWriter()
04040 #endif  // ELPP_WARNING_LOG
04041 #if ELPP_DEBUG_LOG
04042 #  define CDEBUG_IF(writer, condition_, dispatchAction, ...)\
04043 ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Debug, dispatchAction, __VA_ARGS__)
04044 #else
04045 #  define CDEBUG_IF(writer, condition_, dispatchAction, ...) el::base::NullWriter()
04046 #endif  // ELPP_DEBUG_LOG
04047 #if ELPP_ERROR_LOG
04048 #  define CERROR_IF(writer, condition_, dispatchAction, ...)\
04049 ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Error, dispatchAction, __VA_ARGS__)
04050 #else
04051 #  define CERROR_IF(writer, condition_, dispatchAction, ...) el::base::NullWriter()
04052 #endif  // ELPP_ERROR_LOG
04053 #if ELPP_FATAL_LOG
04054 #  define CFATAL_IF(writer, condition_, dispatchAction, ...)\
04055 ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Fatal, dispatchAction, __VA_ARGS__)
04056 #else
04057 #  define CFATAL_IF(writer, condition_, dispatchAction, ...) el::base::NullWriter()
04058 #endif  // ELPP_FATAL_LOG
04059 #if ELPP_TRACE_LOG
04060 #  define CTRACE_IF(writer, condition_, dispatchAction, ...)\
04061 ELPP_WRITE_LOG_IF(writer, (condition_), el::Level::Trace, dispatchAction, __VA_ARGS__)
```

```
04062 #else
04063 #  define CTRACE_IF(writer, condition_, dispatchAction, ...) el::base::NullWriter()
04064 #endif  // ELPP_TRACE_LOG
04065 #if ELPP_VERBOSE_LOG
04066 #  define CVERBOSE_IF(writer, condition_, vlevel, dispatchAction, ...) if (VLOG_IS_ON(vlevel) &&
      (condition_)) writer( \
04067 el::Level::Verbose, __FILE__, __LINE__, ELPP_FUNC, dispatchAction,
      vlevel).construct(el_getVALength(__VA_ARGS__), __VA_ARGS__)
04068 #else
04069 #  define CVERBOSE_IF(writer, condition_, vlevel, dispatchAction, ...) el::base::NullWriter()
04070 #endif  // ELPP_VERBOSE_LOG
04071 // Occasional logs
04072 #if ELPP_INFO_LOG
04073 #  define CINFO_EVERY_N(writer, occasion, dispatchAction, ...)\
04074 ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Info, dispatchAction, __VA_ARGS__)
04075 #else
04076 #  define CINFO_EVERY_N(writer, occasion, dispatchAction, ...) el::base::NullWriter()
04077 #endif  // ELPP_INFO_LOG
04078 #if ELPP_WARNING_LOG
04079 #  define CWARNING_EVERY_N(writer, occasion, dispatchAction, ...)\
04080 ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Warning, dispatchAction, __VA_ARGS__)
04081 #else
04082 #  define CWARNING_EVERY_N(writer, occasion, dispatchAction, ...) el::base::NullWriter()
04083 #endif  // ELPP_WARNING_LOG
04084 #if ELPP_DEBUG_LOG
04085 #  define CDEBUG_EVERY_N(writer, occasion, dispatchAction, ...)\
04086 ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Debug, dispatchAction, __VA_ARGS__)
04087 #else
04088 #  define CDEBUG_EVERY_N(writer, occasion, dispatchAction, ...) el::base::NullWriter()
04089 #endif  // ELPP_DEBUG_LOG
04090 #if ELPP_ERROR_LOG
04091 #  define CERROR_EVERY_N(writer, occasion, dispatchAction, ...)\
04092 ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Error, dispatchAction, __VA_ARGS__)
04093 #else
04094 #  define CERROR_EVERY_N(writer, occasion, dispatchAction, ...) el::base::NullWriter()
04095 #endif  // ELPP_ERROR_LOG
04096 #if ELPP_FATAL_LOG
04097 #  define CFATAL_EVERY_N(writer, occasion, dispatchAction, ...)\
04098 ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Fatal, dispatchAction, __VA_ARGS__)
04099 #else
04100 #  define CFATAL_EVERY_N(writer, occasion, dispatchAction, ...) el::base::NullWriter()
04101 #endif  // ELPP_FATAL_LOG
04102 #if ELPP_TRACE_LOG
04103 #  define CTRACE_EVERY_N(writer, occasion, dispatchAction, ...)\
04104 ELPP_WRITE_LOG_EVERY_N(writer, occasion, el::Level::Trace, dispatchAction, __VA_ARGS__)
04105 #else
04106 #  define CTRACE_EVERY_N(writer, occasion, dispatchAction, ...) el::base::NullWriter()
04107 #endif  // ELPP_TRACE_LOG
04108 #if ELPP_VERBOSE_LOG
04109 #  define CVERBOSE_EVERY_N(writer, occasion, vlevel, dispatchAction, ...)\
04110 CVERBOSE_IF(writer, ELPP->validateEveryNCounter(__FILE__, __LINE__, occasion), vlevel, dispatchAction,
      __VA_ARGS__)
04111 #else
04112 #  define CVERBOSE_EVERY_N(writer, occasion, vlevel, dispatchAction, ...) el::base::NullWriter()
04113 #endif  // ELPP_VERBOSE_LOG
04114 // After N logs
04115 #if ELPP_INFO_LOG
04116 #  define CINFO_AFTER_N(writer, n, dispatchAction, ...)\
04117 ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Info, dispatchAction, __VA_ARGS__)
04118 #else
04119 #  define CINFO_AFTER_N(writer, n, dispatchAction, ...) el::base::NullWriter()
04120 #endif  // ELPP_INFO_LOG
04121 #if ELPP_WARNING_LOG
04122 #  define CWARNING_AFTER_N(writer, n, dispatchAction, ...)\
04123 ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Warning, dispatchAction, __VA_ARGS__)
04124 #else
04125 #  define CWARNING_AFTER_N(writer, n, dispatchAction, ...) el::base::NullWriter()
04126 #endif  // ELPP_WARNING_LOG
04127 #if ELPP_DEBUG_LOG
04128 #  define CDEBUG_AFTER_N(writer, n, dispatchAction, ...)\
04129 ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Debug, dispatchAction, __VA_ARGS__)
04130 #else
04131 #  define CDEBUG_AFTER_N(writer, n, dispatchAction, ...) el::base::NullWriter()
04132 #endif  // ELPP_DEBUG_LOG
04133 #if ELPP_ERROR_LOG
04134 #  define CERROR_AFTER_N(writer, n, dispatchAction, ...)\
04135 ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Error, dispatchAction, __VA_ARGS__)
04136 #else
04137 #  define CERROR_AFTER_N(writer, n, dispatchAction, ...) el::base::NullWriter()
04138 #endif  // ELPP_ERROR_LOG
04139 #if ELPP_FATAL_LOG
04140 #  define CFATAL_AFTER_N(writer, n, dispatchAction, ...)\
04141 ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Fatal, dispatchAction, __VA_ARGS__)
04142 #else
04143 #  define CFATAL_AFTER_N(writer, n, dispatchAction, ...) el::base::NullWriter()
04144 #endif  // ELPP_FATAL_LOG
04145 #if ELPP_TRACE_LOG
```

```
04146 #  define CTRACE_AFTER_N(writer, n, dispatchAction, ...)\
04147 ELPP_WRITE_LOG_AFTER_N(writer, n, el::Level::Trace, dispatchAction, __VA_ARGS__)
04148 #else
04149 #  define CTRACE_AFTER_N(writer, n, dispatchAction, ...) el::base::NullWriter()
04150 #endif  // ELPP_TRACE_LOG
04151 #if ELPP_VERBOSE_LOG
04152 #  define CVERBOSE_AFTER_N(writer, n, vlevel, dispatchAction, ...)\
04153 CVERBOSE_IF(writer, ELPP->validateAfterNCounter(__FILE__, __LINE__, n), vlevel, dispatchAction,
      __VA_ARGS__)
04154 #else
04155 #  define CVERBOSE_AFTER_N(writer, n, vlevel, dispatchAction, ...) el::base::NullWriter()
04156 #endif  // ELPP_VERBOSE_LOG
04157 // N Times logs
04158 #if ELPP_INFO_LOG
04159 #  define CINFO_N_TIMES(writer, n, dispatchAction, ...)\
04160 ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Info, dispatchAction, __VA_ARGS__)
04161 #else
04162 #  define CINFO_N_TIMES(writer, n, dispatchAction, ...) el::base::NullWriter()
04163 #endif  // ELPP_INFO_LOG
04164 #if ELPP_WARNING_LOG
04165 #  define CWARNING_N_TIMES(writer, n, dispatchAction, ...)\
04166 ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Warning, dispatchAction, __VA_ARGS__)
04167 #else
04168 #  define CWARNING_N_TIMES(writer, n, dispatchAction, ...) el::base::NullWriter()
04169 #endif  // ELPP_WARNING_LOG
04170 #if ELPP_DEBUG_LOG
04171 #  define CDEBUG_N_TIMES(writer, n, dispatchAction, ...)\
04172 ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Debug, dispatchAction, __VA_ARGS__)
04173 #else
04174 #  define CDEBUG_N_TIMES(writer, n, dispatchAction, ...) el::base::NullWriter()
04175 #endif  // ELPP_DEBUG_LOG
04176 #if ELPP_ERROR_LOG
04177 #  define CERROR_N_TIMES(writer, n, dispatchAction, ...)\
04178 ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Error, dispatchAction, __VA_ARGS__)
04179 #else
04180 #  define CERROR_N_TIMES(writer, n, dispatchAction, ...) el::base::NullWriter()
04181 #endif  // ELPP_ERROR_LOG
04182 #if ELPP_FATAL_LOG
04183 #  define CFATAL_N_TIMES(writer, n, dispatchAction, ...)\
04184 ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Fatal, dispatchAction, __VA_ARGS__)
04185 #else
04186 #  define CFATAL_N_TIMES(writer, n, dispatchAction, ...) el::base::NullWriter()
04187 #endif  // ELPP_FATAL_LOG
04188 #if ELPP_TRACE_LOG
04189 #  define CTRACE_N_TIMES(writer, n, dispatchAction, ...)\
04190 ELPP_WRITE_LOG_N_TIMES(writer, n, el::Level::Trace, dispatchAction, __VA_ARGS__)
04191 #else
04192 #  define CTRACE_N_TIMES(writer, n, dispatchAction, ...) el::base::NullWriter()
04193 #endif  // ELPP_TRACE_LOG
04194 #if ELPP_VERBOSE_LOG
04195 #  define CVERBOSE_N_TIMES(writer, n, vlevel, dispatchAction, ...)\
04196 CVERBOSE_IF(writer, ELPP->validateNTimesCounter(__FILE__, __LINE__, n), vlevel, dispatchAction,
      __VA_ARGS__)
04197 #else
04198 #  define CVERBOSE_N_TIMES(writer, n, vlevel, dispatchAction, ...) el::base::NullWriter()
04199 #endif  // ELPP_VERBOSE_LOG
04200 //
04201 // Custom Loggers - Requires (level, dispatchAction, loggerId/s)
04202 //
04203 // undef existing
04204 #undef CLOG
04205 #undef CLOG_VERBOSE
04206 #undef CVLOG
04207 #undef CLOG_IF
04208 #undef CLOG_VERBOSE_IF
04209 #undef CVLOG_IF
04210 #undef CLOG_EVERY_N
04211 #undef CVLOG_EVERY_N
04212 #undef CLOG_AFTER_N
04213 #undef CVLOG_AFTER_N
04214 #undef CLOG_N_TIMES
04215 #undef CVLOG_N_TIMES
04216 // Normal logs
04217 #define CLOG(LEVEL, ...)\
04218 C##LEVEL(el::base::Writer, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04219 #define CVLOG(vlevel, ...) CVERBOSE(el::base::Writer, vlevel, el::base::DispatchAction::NormalLog,
      __VA_ARGS__)
04220 // Conditional logs
04221 #define CLOG_IF(condition, LEVEL, ...)\
04222 C##LEVEL##_IF(el::base::Writer, condition, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04223 #define CVLOG_IF(condition, vlevel, ...)\
04224 CVERBOSE_IF(el::base::Writer, condition, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04225 // Hit counts based logs
04226 #define CLOG_EVERY_N(n, LEVEL, ...)\
04227 C##LEVEL##_EVERY_N(el::base::Writer, n, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04228 #define CVLOG_EVERY_N(n, vlevel, ...)\
04229 CVERBOSE_EVERY_N(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
```

```
04230 #define CLOG_AFTER_N(n, LEVEL, ...)\
04231 C##LEVEL##_AFTER_N(el::base::Writer, n, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04232 #define CVLOG_AFTER_N(n, vlevel, ...)\
04233 CVERBOSE_AFTER_N(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04234 #define CLOG_N_TIMES(n, LEVEL, ...)\
04235 C##LEVEL##_N_TIMES(el::base::Writer, n, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04236 #define CVLOG_N_TIMES(n, vlevel, ...)\
04237 CVERBOSE_N_TIMES(el::base::Writer, n, vlevel, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04238 //
04239 // Default Loggers macro using CLOG(), CLOG_VERBOSE() and CVLOG() macros
04240 //
04241 // undef existing
04242 #undef LOG
04243 #undef VLOG
04244 #undef LOG_IF
04245 #undef VLOG_IF
04246 #undef LOG_EVERY_N
04247 #undef VLOG_EVERY_N
04248 #undef LOG_AFTER_N
04249 #undef VLOG_AFTER_N
04250 #undef LOG_N_TIMES
04251 #undef VLOG_N_TIMES
04252 #undef ELPP_CURR_FILE_LOGGER_ID
04253 #if defined(ELPP_DEFAULT_LOGGER)
04254 #  define ELPP_CURR_FILE_LOGGER_ID ELPP_DEFAULT_LOGGER
04255 #else
04256 #  define ELPP_CURR_FILE_LOGGER_ID el::base::consts::kDefaultLoggerId
04257 #endif
04258 #undef ELPP_TRACE
04259 #define ELPP_TRACE CLOG(TRACE, ELPP_CURR_FILE_LOGGER_ID)
04260 // Normal logs
04261 #define LOG(LEVEL) CLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04262 #define VLOG(vlevel) CVLOG(vlevel, ELPP_CURR_FILE_LOGGER_ID)
04263 // Conditional logs
04264 #define LOG_IF(condition, LEVEL) CLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04265 #define VLOG_IF(condition, vlevel) CVLOG_IF(condition, vlevel, ELPP_CURR_FILE_LOGGER_ID)
04266 // Hit counts based logs
04267 #define LOG_EVERY_N(n, LEVEL) CLOG_EVERY_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04268 #define VLOG_EVERY_N(n, vlevel) CVLOG_EVERY_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
04269 #define LOG_AFTER_N(n, LEVEL) CLOG_AFTER_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04270 #define VLOG_AFTER_N(n, vlevel) CVLOG_AFTER_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
04271 #define LOG_N_TIMES(n, LEVEL) CLOG_N_TIMES(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04272 #define VLOG_N_TIMES(n, vlevel) CVLOG_N_TIMES(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
04273 // Generic PLOG()
04274 #undef CPLOG
04275 #undef CPLOG_IF
04276 #undef PLOG
04277 #undef PLOG_IF
04278 #undef DCPLOG
04279 #undef DCPLOG_IF
04280 #undef DPLOG
04281 #undef DPLOG_IF
04282 #define CPLOG(LEVEL, ...)\
04283 C##LEVEL(el::base::PErrorWriter, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04284 #define CPLOG_IF(condition, LEVEL, ...)\
04285 C##LEVEL##_IF(el::base::PErrorWriter, condition, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04286 #define DCPLOG(LEVEL, ...)\
04287 if (ELPP_DEBUG_LOG) C##LEVEL(el::base::PErrorWriter, el::base::DispatchAction::NormalLog, __VA_ARGS__)
04288 #define DCPLOG_IF(condition, LEVEL, ...)\
04289 C##LEVEL##_IF(el::base::PErrorWriter, (ELPP_DEBUG_LOG) && (condition),
     el::base::DispatchAction::NormalLog, __VA_ARGS__)
04290 #define PLOG(LEVEL) CPLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04291 #define PLOG_IF(condition, LEVEL) CPLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04292 #define DPLOG(LEVEL) DCPLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04293 #define DPLOG_IF(condition, LEVEL) DCPLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04294 // Generic SYSLOG()
04295 #undef CSYSLOG
04296 #undef CSYSLOG_IF
04297 #undef CSYSLOG_EVERY_N
04298 #undef CSYSLOG_AFTER_N
04299 #undef CSYSLOG_N_TIMES
04300 #undef SYSLOG
04301 #undef SYSLOG_IF
04302 #undef SYSLOG_EVERY_N
04303 #undef SYSLOG_AFTER_N
04304 #undef SYSLOG_N_TIMES
04305 #undef DCSYSLOG
04306 #undef DCSYSLOG_IF
04307 #undef DCSYSLOG_EVERY_N
04308 #undef DCSYSLOG_AFTER_N
04309 #undef DCSYSLOG_N_TIMES
04310 #undef DSYSLOG
04311 #undef DSYSLOG_IF
04312 #undef DSYSLOG_EVERY_N
04313 #undef DSYSLOG_AFTER_N
04314 #undef DSYSLOG_N_TIMES
04315 #if defined(ELPP_SYSLOG)
```

```
04316 #  define CSYSLOG(LEVEL, ...)\
04317 C##LEVEL(el::base::Writer, el::base::DispatchAction::SysLog, __VA_ARGS__)
04318 #  define CSYSLOG_IF(condition, LEVEL, ...)\
04319 C##LEVEL##_IF(el::base::Writer, condition, el::base::DispatchAction::SysLog, __VA_ARGS__)
04320 #  define CSYSLOG_EVERY_N(n, LEVEL, ...) C##LEVEL##_EVERY_N(el::base::Writer, n,
      el::base::DispatchAction::SysLog, __VA_ARGS__)
04321 #  define CSYSLOG_AFTER_N(n, LEVEL, ...) C##LEVEL##_AFTER_N(el::base::Writer, n,
      el::base::DispatchAction::SysLog, __VA_ARGS__)
04322 #  define CSYSLOG_N_TIMES(n, LEVEL, ...) C##LEVEL##_N_TIMES(el::base::Writer, n,
      el::base::DispatchAction::SysLog, __VA_ARGS__)
04323 #  define SYSLOG(LEVEL) CSYSLOG(LEVEL, el::base::consts::kSysLogLoggerId)
04324 #  define SYSLOG_IF(condition, LEVEL) CSYSLOG_IF(condition, LEVEL, el::base::consts::kSysLogLoggerId)
04325 #  define SYSLOG_EVERY_N(n, LEVEL) CSYSLOG_EVERY_N(n, LEVEL, el::base::consts::kSysLogLoggerId)
04326 #  define SYSLOG_AFTER_N(n, LEVEL) CSYSLOG_AFTER_N(n, LEVEL, el::base::consts::kSysLogLoggerId)
04327 #  define SYSLOG_N_TIMES(n, LEVEL) CSYSLOG_N_TIMES(n, LEVEL, el::base::consts::kSysLogLoggerId)
04328 #  define DCSYSLOG(LEVEL, ...) if (ELPP_DEBUG_LOG) C##LEVEL(el::base::Writer,
      el::base::DispatchAction::SysLog, __VA_ARGS__)
04329 #  define DCSYSLOG_IF(condition, LEVEL, ...)\
04330 C##LEVEL##_IF(el::base::Writer, (ELPP_DEBUG_LOG) && (condition), el::base::DispatchAction::SysLog,
      __VA_ARGS__)
04331 #  define DCSYSLOG_EVERY_N(n, LEVEL, ...)\
04332 if (ELPP_DEBUG_LOG) C##LEVEL##_EVERY_N(el::base::Writer, n, el::base::DispatchAction::SysLog,
      __VA_ARGS__)
04333 #  define DCSYSLOG_AFTER_N(n, LEVEL, ...)\
04334 if (ELPP_DEBUG_LOG) C##LEVEL##_AFTER_N(el::base::Writer, n, el::base::DispatchAction::SysLog,
      __VA_ARGS__)
04335 #  define DCSYSLOG_N_TIMES(n, LEVEL, ...)\
04336 if (ELPP_DEBUG_LOG) C##LEVEL##_EVERY_N(el::base::Writer, n, el::base::DispatchAction::SysLog,
      __VA_ARGS__)
04337 #  define DSYSLOG(LEVEL) DCSYSLOG(LEVEL, el::base::consts::kSysLogLoggerId)
04338 #  define DSYSLOG_IF(condition, LEVEL) DCSYSLOG_IF(condition, LEVEL,
      el::base::consts::kSysLogLoggerId)
04339 #  define DSYSLOG_EVERY_N(n, LEVEL) DCSYSLOG_EVERY_N(n, LEVEL, el::base::consts::kSysLogLoggerId)
04340 #  define DSYSLOG_AFTER_N(n, LEVEL) DCSYSLOG_AFTER_N(n, LEVEL, el::base::consts::kSysLogLoggerId)
04341 #  define DSYSLOG_N_TIMES(n, LEVEL) DCSYSLOG_N_TIMES(n, LEVEL, el::base::consts::kSysLogLoggerId)
04342 #else
04343 #  define CSYSLOG(LEVEL, ...) el::base::NullWriter()
04344 #  define CSYSLOG_IF(condition, LEVEL, ...) el::base::NullWriter()
04345 #  define CSYSLOG_EVERY_N(n, LEVEL, ...) el::base::NullWriter()
04346 #  define CSYSLOG_AFTER_N(n, LEVEL, ...) el::base::NullWriter()
04347 #  define CSYSLOG_N_TIMES(n, LEVEL, ...) el::base::NullWriter()
04348 #  define SYSLOG(LEVEL) el::base::NullWriter()
04349 #  define SYSLOG_IF(condition, LEVEL) el::base::NullWriter()
04350 #  define SYSLOG_EVERY_N(n, LEVEL) el::base::NullWriter()
04351 #  define SYSLOG_AFTER_N(n, LEVEL) el::base::NullWriter()
04352 #  define SYSLOG_N_TIMES(n, LEVEL) el::base::NullWriter()
04353 #  define DCSYSLOG(LEVEL, ...) el::base::NullWriter()
04354 #  define DCSYSLOG_IF(condition, LEVEL, ...) el::base::NullWriter()
04355 #  define DCSYSLOG_EVERY_N(n, LEVEL, ...) el::base::NullWriter()
04356 #  define DCSYSLOG_AFTER_N(n, LEVEL, ...) el::base::NullWriter()
04357 #  define DCSYSLOG_N_TIMES(n, LEVEL, ...) el::base::NullWriter()
04358 #  define DSYSLOG(LEVEL) el::base::NullWriter()
04359 #  define DSYSLOG_IF(condition, LEVEL) el::base::NullWriter()
04360 #  define DSYSLOG_EVERY_N(n, LEVEL) el::base::NullWriter()
04361 #  define DSYSLOG_AFTER_N(n, LEVEL) el::base::NullWriter()
04362 #  define DSYSLOG_N_TIMES(n, LEVEL) el::base::NullWriter()
04363 #endif  // defined(ELPP_SYSLOG)
04364 //
04365 // Custom Debug Only Loggers - Requires (level, loggerId/s)
04366 //
04367 // undef existing
04368 #undef DCLOG
04369 #undef DCVLOG
04370 #undef DCLOG_IF
04371 #undef DCVLOG_IF
04372 #undef DCLOG_EVERY_N
04373 #undef DCVLOG_EVERY_N
04374 #undef DCLOG_AFTER_N
04375 #undef DCVLOG_AFTER_N
04376 #undef DCLOG_N_TIMES
04377 #undef DCVLOG_N_TIMES
04378 // Normal logs
04379 #define DCLOG(LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG(LEVEL, __VA_ARGS__)
04380 #define DCLOG_VERBOSE(vlevel, ...) if (ELPP_DEBUG_LOG) CLOG_VERBOSE(vlevel, __VA_ARGS__)
04381 #define DCVLOG(vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG(vlevel, __VA_ARGS__)
04382 // Conditional logs
04383 #define DCLOG_IF(condition, LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG_IF(condition, LEVEL, __VA_ARGS__)
04384 #define DCVLOG_IF(condition, vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG_IF(condition, vlevel, __VA_ARGS__)
04385 // Hit counts based logs
04386 #define DCLOG_EVERY_N(n, LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG_EVERY_N(n, LEVEL, __VA_ARGS__)
04387 #define DCVLOG_EVERY_N(n, vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG_EVERY_N(n, vlevel, __VA_ARGS__)
04388 #define DCLOG_AFTER_N(n, LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG_AFTER_N(n, LEVEL, __VA_ARGS__)
04389 #define DCVLOG_AFTER_N(n, vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG_AFTER_N(n, vlevel, __VA_ARGS__)
04390 #define DCLOG_N_TIMES(n, LEVEL, ...) if (ELPP_DEBUG_LOG) CLOG_N_TIMES(n, LEVEL, __VA_ARGS__)
04391 #define DCVLOG_N_TIMES(n, vlevel, ...) if (ELPP_DEBUG_LOG) CVLOG_N_TIMES(n, vlevel, __VA_ARGS__)
04392 //
04393 // Default Debug Only Loggers macro using CLOG(), CLOG_VERBOSE() and CVLOG() macros
```

```
04394 //
04395 #if !defined(ELPP_NO_DEBUG_MACROS)
04396 // undef existing
04397 #undef DLOG
04398 #undef DVLOG
04399 #undef DLOG_IF
04400 #undef DVLOG_IF
04401 #undef DLOG_EVERY_N
04402 #undef DVLOG_EVERY_N
04403 #undef DLOG_AFTER_N
04404 #undef DVLOG_AFTER_N
04405 #undef DLOG_N_TIMES
04406 #undef DVLOG_N_TIMES
04407 // Normal logs
04408 #define DLOG(LEVEL) DCLOG(LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04409 #define DVLOG(vlevel) DCVLOG(vlevel, ELPP_CURR_FILE_LOGGER_ID)
04410 // Conditional logs
04411 #define DLOG_IF(condition, LEVEL) DCLOG_IF(condition, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04412 #define DVLOG_IF(condition, vlevel) DCVLOG_IF(condition, vlevel, ELPP_CURR_FILE_LOGGER_ID)
04413 // Hit counts based logs
04414 #define DLOG_EVERY_N(n, LEVEL) DCLOG_EVERY_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04415 #define DVLOG_EVERY_N(n, vlevel) DCVLOG_EVERY_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
04416 #define DLOG_AFTER_N(n, LEVEL) DCLOG_AFTER_N(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04417 #define DVLOG_AFTER_N(n, vlevel) DCVLOG_AFTER_N(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
04418 #define DLOG_N_TIMES(n, LEVEL) DCLOG_N_TIMES(n, LEVEL, ELPP_CURR_FILE_LOGGER_ID)
04419 #define DVLOG_N_TIMES(n, vlevel) DCVLOG_N_TIMES(n, vlevel, ELPP_CURR_FILE_LOGGER_ID)
04420 #endif // defined(ELPP_NO_DEBUG_MACROS)
04421 #if !defined(ELPP_NO_CHECK_MACROS)
04422 // Check macros
04423 #undef CCHECK
04424 #undef CPCHECK
04425 #undef CCHECK_EQ
04426 #undef CCHECK_NE
04427 #undef CCHECK_LT
04428 #undef CCHECK_GT
04429 #undef CCHECK_LE
04430 #undef CCHECK_GE
04431 #undef CCHECK_BOUNDS
04432 #undef CCHECK_NOTNULL
04433 #undef CCHECK_STRCASEEQ
04434 #undef CCHECK_STRCASENE
04435 #undef CHECK
04436 #undef PCHECK
04437 #undef CHECK_EQ
04438 #undef CHECK_NE
04439 #undef CHECK_LT
04440 #undef CHECK_GT
04441 #undef CHECK_LE
04442 #undef CHECK_GE
04443 #undef CHECK_BOUNDS
04444 #undef CHECK_NOTNULL
04445 #undef CHECK_STRCASEEQ
04446 #undef CHECK_STRCASENE
04447 #define CCHECK(condition, ...) CLOG_IF(!(condition), FATAL, __VA_ARGS__) « "Check failed: [" «
      #condition « "] "
04448 #define CPCHECK(condition, ...) CPLOG_IF(!(condition), FATAL, __VA_ARGS__) « "Check failed: [" «
      #condition « "] "
04449 #define CHECK(condition) CCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
04450 #define PCHECK(condition) CPCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
04451 #define CCHECK_EQ(a, b, ...) CCHECK(a == b, __VA_ARGS__)
04452 #define CCHECK_NE(a, b, ...) CCHECK(a != b, __VA_ARGS__)
04453 #define CCHECK_LT(a, b, ...) CCHECK(a < b, __VA_ARGS__)
04454 #define CCHECK_GT(a, b, ...) CCHECK(a > b, __VA_ARGS__)
04455 #define CCHECK_LE(a, b, ...) CCHECK(a <= b, __VA_ARGS__)
04456 #define CCHECK_GE(a, b, ...) CCHECK(a >= b, __VA_ARGS__)
04457 #define CCHECK_BOUNDS(val, min, max, ...) CCHECK(val >= min && val <= max, __VA_ARGS__)
04458 #define CHECK_EQ(a, b) CCHECK_EQ(a, b, ELPP_CURR_FILE_LOGGER_ID)
04459 #define CHECK_NE(a, b) CCHECK_NE(a, b, ELPP_CURR_FILE_LOGGER_ID)
04460 #define CHECK_LT(a, b) CCHECK_LT(a, b, ELPP_CURR_FILE_LOGGER_ID)
04461 #define CHECK_GT(a, b) CCHECK_GT(a, b, ELPP_CURR_FILE_LOGGER_ID)
04462 #define CHECK_LE(a, b) CCHECK_LE(a, b, ELPP_CURR_FILE_LOGGER_ID)
04463 #define CHECK_GE(a, b) CCHECK_GE(a, b, ELPP_CURR_FILE_LOGGER_ID)
04464 #define CHECK_BOUNDS(val, min, max) CCHECK_BOUNDS(val, min, max, ELPP_CURR_FILE_LOGGER_ID)
04465 #define CCHECK_NOTNULL(ptr, ...) CCHECK((ptr) != nullptr, __VA_ARGS__)
04466 #define CCHECK_STREQ(str1, str2, ...) CLOG_IF(!el::base::utils::Str::cStringEq(str1, str2), FATAL,
      __VA_ARGS__) \
04467 « "Check failed: [" « #str1 « " == " « #str2 « "] "
04468 #define CCHECK_STRNE(str1, str2, ...) CLOG_IF(el::base::utils::Str::cStringEq(str1, str2), FATAL,
      __VA_ARGS__) \
04469 « "Check failed: [" « #str1 « " != " « #str2 « "] "
04470 #define CCHECK_STRCASEEQ(str1, str2, ...) CLOG_IF(!el::base::utils::Str::cStringCaseEq(str1, str2),
      FATAL, __VA_ARGS__) \
04471 « "Check failed: [" « #str1 « " == " « #str2 « "] "
04472 #define CCHECK_STRCASENE(str1, str2, ...) CLOG_IF(el::base::utils::Str::cStringCaseEq(str1, str2),
      FATAL, __VA_ARGS__) \
04473 « "Check failed: [" « #str1 « " != " « #str2 « "] "
04474 #define CHECK_NOTNULL(ptr) CCHECK_NOTNULL((ptr), ELPP_CURR_FILE_LOGGER_ID)
```

```
04475 #define CHECK_STREQ(str1, str2) CCHECK_STREQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
04476 #define CHECK_STRNE(str1, str2) CCHECK_STRNE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
04477 #define CHECK_STRCASEEQ(str1, str2) CCHECK_STRCASEEQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
04478 #define CHECK_STRCASENE(str1, str2) CCHECK_STRCASENE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
04479 #undef DCCHECK
04480 #undef DCCHECK_EQ
04481 #undef DCCHECK_NE
04482 #undef DCCHECK_LT
04483 #undef DCCHECK_GT
04484 #undef DCCHECK_LE
04485 #undef DCCHECK_GE
04486 #undef DCCHECK_BOUNDS
04487 #undef DCCHECK_NOTNULL
04488 #undef DCCHECK_STRCASEEQ
04489 #undef DCCHECK_STRCASENE
04490 #undef DCPCHECK
04491 #undef DCHECK
04492 #undef DCHECK_EQ
04493 #undef DCHECK_NE
04494 #undef DCHECK_LT
04495 #undef DCHECK_GT
04496 #undef DCHECK_LE
04497 #undef DCHECK_GE
04498 #undef DCHECK_BOUNDS_
04499 #undef DCHECK_NOTNULL
04500 #undef DCHECK_STRCASEEQ
04501 #undef DCHECK_STRCASENE
04502 #undef DPCHECK
04503 #define DCCHECK(condition, ...) if (ELPP_DEBUG_LOG) CCHECK(condition, __VA_ARGS__)
04504 #define DCCHECK_EQ(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_EQ(a, b, __VA_ARGS__)
04505 #define DCCHECK_NE(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_NE(a, b, __VA_ARGS__)
04506 #define DCCHECK_LT(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_LT(a, b, __VA_ARGS__)
04507 #define DCCHECK_GT(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_GT(a, b, __VA_ARGS__)
04508 #define DCCHECK_LE(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_LE(a, b, __VA_ARGS__)
04509 #define DCCHECK_GE(a, b, ...) if (ELPP_DEBUG_LOG) CCHECK_GE(a, b, __VA_ARGS__)
04510 #define DCCHECK_BOUNDS(val, min, max, ...) if (ELPP_DEBUG_LOG) CCHECK_BOUNDS(val, min, max,
      __VA_ARGS__)
04511 #define DCCHECK_NOTNULL(ptr, ...) if (ELPP_DEBUG_LOG) CCHECK_NOTNULL((ptr), __VA_ARGS__)
04512 #define DCCHECK_STREQ(str1, str2, ...) if (ELPP_DEBUG_LOG) CCHECK_STREQ(str1, str2, __VA_ARGS__)
04513 #define DCCHECK_STRNE(str1, str2, ...) if (ELPP_DEBUG_LOG) CCHECK_STRNE(str1, str2, __VA_ARGS__)
04514 #define DCCHECK_STRCASEEQ(str1, str2, ...) if (ELPP_DEBUG_LOG) CCHECK_STRCASEEQ(str1, str2,
      __VA_ARGS__)
04515 #define DCCHECK_STRCASENE(str1, str2, ...) if (ELPP_DEBUG_LOG) CCHECK_STRCASENE(str1, str2,
      __VA_ARGS__)
04516 #define DCPCHECK(condition, ...) if (ELPP_DEBUG_LOG) CPCHECK(condition, __VA_ARGS__)
04517 #define DCHECK(condition) DCCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
04518 #define DCHECK_EQ(a, b) DCCHECK_EQ(a, b, ELPP_CURR_FILE_LOGGER_ID)
04519 #define DCHECK_NE(a, b) DCCHECK_NE(a, b, ELPP_CURR_FILE_LOGGER_ID)
04520 #define DCHECK_LT(a, b) DCCHECK_LT(a, b, ELPP_CURR_FILE_LOGGER_ID)
04521 #define DCHECK_GT(a, b) DCCHECK_GT(a, b, ELPP_CURR_FILE_LOGGER_ID)
04522 #define DCHECK_LE(a, b) DCCHECK_LE(a, b, ELPP_CURR_FILE_LOGGER_ID)
04523 #define DCHECK_GE(a, b) DCCHECK_GE(a, b, ELPP_CURR_FILE_LOGGER_ID)
04524 #define DCHECK_BOUNDS(val, min, max) DCCHECK_BOUNDS(val, min, max, ELPP_CURR_FILE_LOGGER_ID)
04525 #define DCHECK_NOTNULL(ptr) DCCHECK_NOTNULL((ptr), ELPP_CURR_FILE_LOGGER_ID)
04526 #define DCHECK_STREQ(str1, str2) DCCHECK_STREQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
04527 #define DCHECK_STRNE(str1, str2) DCCHECK_STRNE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
04528 #define DCHECK_STRCASEEQ(str1, str2) DCCHECK_STRCASEEQ(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
04529 #define DCHECK_STRCASENE(str1, str2) DCCHECK_STRCASENE(str1, str2, ELPP_CURR_FILE_LOGGER_ID)
04530 #define DPCHECK(condition) DCPCHECK(condition, ELPP_CURR_FILE_LOGGER_ID)
04531 #endif // defined(ELPP_NO_CHECK_MACROS)
04532 #if defined(ELPP_DISABLE_DEFAULT_CRASH_HANDLING)
04533 #  define ELPP_USE_DEF_CRASH_HANDLER false
04534 #else
04535 #  define ELPP_USE_DEF_CRASH_HANDLER true
04536 #endif  // defined(ELPP_DISABLE_DEFAULT_CRASH_HANDLING)
04537 #define ELPP_CRASH_HANDLER_INIT
04538 #define ELPP_INIT_EASYLOGGINGPP(val) \
04539 namespace el { \
04540 namespace base { \
04541 el::base::type::StoragePointer elStorage(val); \
04542 } \
04543 el::base::debug::CrashHandler elCrashHandler(ELPP_USE_DEF_CRASH_HANDLER); \
04544 }
04545
04546 #if ELPP_ASYNC_LOGGING
04547 #  define INITIALIZE_EASYLOGGINGPP ELPP_INIT_EASYLOGGINGPP(new el::base::Storage(el::LogBuilderPtr(new
      el::base::DefaultLogBuilder()),\
04548 new el::base::AsyncDispatchWorker()))
04549 #else
04550 #  define INITIALIZE_EASYLOGGINGPP ELPP_INIT_EASYLOGGINGPP(new el::base::Storage(el::LogBuilderPtr(new
      el::base::DefaultLogBuilder())))
04551 #endif  // ELPP_ASYNC_LOGGING
04552 #define INITIALIZE_NULL_EASYLOGGINGPP \
04553 namespace el {\
04554 namespace base {\
04555 el::base::type::StoragePointer elStorage;\
04556 }\
```

```
04557 el::base::debug::CrashHandler elCrashHandler(ELPP_USE_DEF_CRASH_HANDLER);\
04558 }
04559 #define SHARE_EASYLOGGINGPP(initializedStorage)\
04560 namespace el {\
04561 namespace base {\
04562 el::base::type::StoragePointer elStorage(initializedStorage);\
04563 }\
04564 el::base::debug::CrashHandler elCrashHandler(ELPP_USE_DEF_CRASH_HANDLER);\
04565 }
04566
04567 #if defined(ELPP_UNICODE)
04568 #  define START_EASYLOGGINGPP(argc, argv) el::Helpers::setArgs(argc, argv);
      std::locale::global(std::locale(""))
04569 #else
04570 #  define START_EASYLOGGINGPP(argc, argv) el::Helpers::setArgs(argc, argv)
04571 #endif  // defined(ELPP_UNICODE)
04572 #endif // EASYLOGGINGPP_H
```

10.3 include/jsoncpp/allocator.h File Reference

```
#include <cstring>
#include <memory>
```

Data Structures

- class Json::SecureAllocator< T >
- struct Json::SecureAllocator< T >::rebind< U >

Namespaces

- namespace Json

  JSON (JavaScript Object Notation).

Functions

- template<typename T , typename U >
  bool Json::operator== (const SecureAllocator< T > &, const SecureAllocator< U > &)
- template<typename T , typename U >
  bool Json::operator!= (const SecureAllocator< T > &, const SecureAllocator< U > &)

10.4 allocator.h

Go to the documentation of this file.

```
00001 // Copyright 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
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00004 // See file LICENSE for detail or copy at http://jsoncpp.sourceforge.net/LICENSE
00005
00006 #ifndef JSON_ALLOCATOR_H_INCLUDED
00007 #define JSON_ALLOCATOR_H_INCLUDED
00008
00009 #include <cstring>
00010 #include <memory>
00011
00012 #pragma pack(push)
00013 #pragma pack()
00014
00015 namespace Json {
00016 template <typename T> class SecureAllocator {
```

```
00017 public:
00018     // Type definitions
00019     using value_type = T;
00020     using pointer = T*;
00021     using const_pointer = const T*;
00022     using reference = T&;
00023     using const_reference = const T&;
00024     using size_type = std::size_t;
00025     using difference_type = std::ptrdiff_t;
00026 
00030     pointer allocate(size_type n) {
00031         // allocate using "global operator new"
00032         return static_cast<pointer>(::operator new(n * sizeof(T)));
00033     }
00034 
00040     void deallocate(pointer p, size_type n) {
00041         // memset_s is used because memset may be optimized away by the compiler
00042         memset_s(p, n * sizeof(T), 0, n * sizeof(T));
00043         // free using "global operator delete"
00044         ::operator delete(p);
00045     }
00046 
00050     template <typename... Args> void construct(pointer p, Args&&... args) {
00051         // construct using "placement new" and "perfect forwarding"
00052         ::new (static_cast<void*>(p)) T(std::forward<Args>(args)...);
00053     }
00054 
00055     size_type max_size() const {
00056         return size_t(-1) / sizeof(T);
00057     }
00058 
00059     pointer address(reference x) const {
00060         return std::addressof(x);
00061     }
00062 
00063     const_pointer address(const_reference x) const {
00064         return std::addressof(x);
00065     }
00066 
00070     void destroy(pointer p) {
00071         // destroy using "explicit destructor"
00072         p->~T();
00073     }
00074 
00075     // Boilerplate
00076     SecureAllocator() {}
00077     template <typename U> SecureAllocator(const SecureAllocator<U>&) {}
00078     template <typename U> struct rebind {
00079         using other = SecureAllocator<U>;
00080     };
00081 };
00082 
00083 template <typename T, typename U>
00084 bool operator==(const SecureAllocator<T>&, const SecureAllocator<U>&) {
00085     return true;
00086 }
00087 
00088 template <typename T, typename U>
00089 bool operator!=(const SecureAllocator<T>&, const SecureAllocator<U>&) {
00090     return false;
00091 }
00092 
00093 } // namespace Json
00094 
00095 #pragma pack(pop)
00096 
00097 #endif // JSON_ALLOCATOR_H_INCLUDED
```

10.5 include/jsoncpp/assertions.h File Reference

```
#include <cstdlib>
#include <sstream>
#include "config.h"
```

Macros

- #define JSON_ASSERT(condition)

- #define JSON_FAIL_MESSAGE(message)
- #define JSON_ASSERT_MESSAGE(condition, message)

10.5.1 Macro Definition Documentation

10.5.1.1 JSON_ASSERT

```
#define JSON_ASSERT(
              condition )
```

Value:

```
  do {                                                                  \
    if (!(condition)) {                                                 \
      Json::throwLogicError("assert json failed");                       \
    }                                                                   \
  } while (0)
```

It should not be possible for a maliciously designed file to cause an abort() or seg-fault, so these macros are used only for pre-condition violations and internal logic errors.

Definition at line 23 of file assertions.h.

10.5.1.2 JSON_ASSERT_MESSAGE

```
#define JSON_ASSERT_MESSAGE(
              condition,
              message )
```

Value:

```
  do {                                                                  \
    if (!(condition)) {                                                 \
      JSON_FAIL_MESSAGE(message);                                       \
    }                                                                   \
  } while (0)
```

Definition at line 54 of file assertions.h.

10.5.1.3 JSON_FAIL_MESSAGE

```
#define JSON_FAIL_MESSAGE(
              message )
```

Value:

```
  do {                                                                  \
    OStringStream oss;                                                  \
    oss « message;                                                     \
    Json::throwLogicError(oss.str());                                   \
    abort();                                                            \
  } while (0)
```

Definition at line 30 of file assertions.h.

10.6 assertions.h

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```
00001 // Copyright 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
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00005
00006 #ifndef JSON_ASSERTIONS_H_INCLUDED
00007 #define JSON_ASSERTIONS_H_INCLUDED
00008
00009 #include <cstdlib>
00010 #include <sstream>
00011
00012 #if !defined(JSON_IS_AMALGAMATION)
00013 #include "config.h"
00014 #endif // if !defined(JSON_IS_AMALGAMATION)
00015
00020 #if JSON_USE_EXCEPTION
00021
00022 // @todo <= add detail about condition in exception
00023 #define JSON_ASSERT(condition)                                                \
00024   do {                                                                       \
00025     if (!(condition)) {                                                      \
00026       Json::throwLogicError("assert json failed");                           \
00027     }                                                                        \
00028   } while (0)
00029
00030 #define JSON_FAIL_MESSAGE(message)                                           \
00031   do {                                                                       \
00032     OStringStream oss;                                                       \
00033     oss « message;                                                          \
00034     Json::throwLogicError(oss.str());                                        \
00035     abort();                                                                 \
00036   } while (0)
00037
00038 #else // JSON_USE_EXCEPTION
00039
00040 #define JSON_ASSERT(condition) assert(condition)
00041
00042 // The call to assert() will show the failure message in debug builds. In
00043 // release builds we abort, for a core-dump or debugger.
00044 #define JSON_FAIL_MESSAGE(message)                                           \
00045   {                                                                          \
00046     OStringStream oss;                                                       \
00047     oss « message;                                                          \
00048     assert(false && oss.str().c_str());                                      \
00049     abort();                                                                 \
00050   }
00051
00052 #endif
00053
00054 #define JSON_ASSERT_MESSAGE(condition, message)                              \
00055   do {                                                                       \
00056     if (!(condition)) {                                                      \
00057       JSON_FAIL_MESSAGE(message);                                            \
00058     }                                                                        \
00059   } while (0)
00060
00061 #endif // JSON_ASSERTIONS_H_INCLUDED
```

10.7 include/jsoncpp/config.h File Reference

```
#include <cstddef>
#include <cstdint>
#include <istream>
#include <memory>
#include <ostream>
#include <sstream>
#include <string>
#include <type_traits>
#include "allocator.h"
#include "version.h"
```

Namespaces

- namespace Json

  JSON (JavaScript Object Notation).

Macros

- #define JSON_USE_EXCEPTION 1
- #define JSON_USE_NULLREF 1
- #define JSON_API
- #define jsoncpp_snprintf std::snprintf
- #define JSONCPP_OVERRIDE override
- #define JSONCPP_DEPRECATED(message)
- #define JSON_HAS_INT64

Typedefs

- using Json::Int = int
- using Json::UInt = unsigned int
- using Json::Int64 = int64_t
- using Json::UInt64 = uint64_t
- using Json::LargestInt = Int64
- using Json::LargestUInt = UInt64
- template<typename T >
  using Json::Allocator = typename std::conditional< JSONCPP_USING_SECURE_MEMORY, SecureAllocator< T >, std::allocator< T > >::type
- using Json::String = std::basic_string< char, std::char_traits< char >, Allocator< char > >
- using Json::IStringStream = std::basic_istringstream< String::value_type, String::traits_type, String::allocator_type >
- using Json::OStringStream = std::basic_ostringstream< String::value_type, String::traits_type, String::allocator_type >
- using Json::IStream = std::istream
- using Json::OStream = std::ostream
- using JSONCPP_STRING = Json::String
- using JSONCPP_ISTRINGSTREAM = Json::IStringStream
- using JSONCPP_OSTRINGSTREAM = Json::OStringStream
- using JSONCPP_ISTREAM = Json::IStream
- using JSONCPP_OSTREAM = Json::OStream

10.7.1 Macro Definition Documentation

10.7.1.1 JSON_API

```
#define JSON_API
```

If defined, indicates that the source file is amalgamated to prevent private header inclusion. Remarks: it is automatically defined in the generated amalgamated header.

Definition at line 50 of file config.h.

10.7.1.2 JSON_HAS_INT64

```
#define JSON_HAS_INT64
```

Definition at line 125 of file config.h.

10.7.1.3 JSON_USE_EXCEPTION

```
#define JSON_USE_EXCEPTION 1
```

Definition at line 20 of file config.h.

10.7.1.4 JSON_USE_NULLREF

```
#define JSON_USE_NULLREF 1
```

Definition at line 25 of file config.h.

10.7.1.5 JSONCPP_DEPRECATED

```
#define JSONCPP_DEPRECATED(
              message )
```

Definition at line 93 of file config.h.

10.7.1.6 JSONCPP_OVERRIDE

```
#define JSONCPP_OVERRIDE override
```

Definition at line 75 of file config.h.

10.7.1.7 jsoncpp_snprintf

```
#define jsoncpp_snprintf std::snprintf
```

Definition at line 65 of file config.h.

10.7.2 Typedef Documentation

10.7.2.1 JSONCPP_ISTREAM

```
using JSONCPP_ISTREAM = Json::IStream
```

Definition at line 147 of file config.h.

10.7.2.2 JSONCPP_ISTRINGSTREAM

```
using JSONCPP_ISTRINGSTREAM = Json::IStringStream
```

Definition at line 145 of file config.h.

10.7.2.3 JSONCPP_OSTREAM

```
using JSONCPP_OSTREAM = Json::OStream
```

Definition at line 148 of file config.h.

10.7.2.4 JSONCPP_OSTRINGSTREAM

```
using JSONCPP_OSTRINGSTREAM = Json::OStringStream
```

Definition at line 146 of file config.h.

10.7.2.5 JSONCPP_STRING

```
using JSONCPP_STRING = Json::String
```

Definition at line 144 of file config.h.

10.8 config.h

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```
00001 // Copyright 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
00002 // Distributed under MIT license, or public domain if desired and
00003 // recognized in your jurisdiction.
00004 // See file LICENSE for detail or copy at http://jsoncpp.sourceforge.net/LICENSE
00005
00006 #ifndef JSON_CONFIG_H_INCLUDED
00007 #define JSON_CONFIG_H_INCLUDED
00008 #include <cstddef>
00009 #include <cstdint>
00010 #include <istream>
00011 #include <memory>
00012 #include <ostream>
00013 #include <sstream>
00014 #include <string>
00015 #include <type_traits>
00016
00017 // If non-zero, the library uses exceptions to report bad input instead of C
00018 // assertion macros. The default is to use exceptions.
00019 #ifndef JSON_USE_EXCEPTION
00020 #define JSON_USE_EXCEPTION 1
00021 #endif
00022
00023 // Temporary, tracked for removal with issue #982.
00024 #ifndef JSON_USE_NULLREF
00025 #define JSON_USE_NULLREF 1
00026 #endif
00027
00031 // #define JSON_IS_AMALGAMATION
00032
00033 // Export macros for DLL visibility
00034 #if defined(JSON_DLL_BUILD)
00035 #if defined(_MSC_VER) || defined(__MINGW32__)
00036 #define JSON_API __declspec(dllexport)
00037 #define JSONCPP_DISABLE_DLL_INTERFACE_WARNING
00038 #elif defined(__GNUC__) || defined(__clang__)
```

```
00039 #define JSON_API __attribute__((visibility("default")))
00040 #endif // if defined(_MSC_VER)
00041
00042 #elif defined(JSON_DLL)
00043 #if defined(_MSC_VER) || defined(__MINGW32__)
00044 #define JSON_API __declspec(dllimport)
00045 #define JSONCPP_DISABLE_DLL_INTERFACE_WARNING
00046 #endif // if defined(_MSC_VER)
00047 #endif // ifdef JSON_DLL_BUILD
00048
00049 #if !defined(JSON_API)
00050 #define JSON_API
00051 #endif
00052
00053 #if defined(_MSC_VER) && _MSC_VER < 1800
00054 #error                                                                    \
00055 "ERROR:  Visual Studio 12 (2013) with _MSC_VER=1800 is the oldest supported compiler with sufficient
      C++11 capabilities"
00056 #endif
00057
00058 #if defined(_MSC_VER) && _MSC_VER < 1900
00059 // As recommended at
00060 // https://stackoverflow.com/questions/2915672/snprintf-and-visual-studio-2010
00061 extern JSON_API int msvc_pre1900_c99_snprintf(char* outBuf, size_t size,
00062         const char* format, ...);
00063 #define jsoncpp_snprintf msvc_pre1900_c99_snprintf
00064 #else
00065 #define jsoncpp_snprintf std::snprintf
00066 #endif
00067
00068 // If JSON_NO_INT64 is defined, then Json only support C++ "int" type for
00069 // integer
00070 // Storages, and 64 bits integer support is disabled.
00071 // #define JSON_NO_INT64 1
00072
00073 // JSONCPP_OVERRIDE is maintained for backwards compatibility of external tools.
00074 // C++11 should be used directly in JSONCPP.
00075 #define JSONCPP_OVERRIDE override
00076
00077 #ifdef __clang__
00078 #if __has_extension(attribute_deprecated_with_message)
00079 #define JSONCPP_DEPRECATED(message) __attribute__((deprecated(message)))
00080 #endif
00081 #elif defined(__GNUC__) // not clang (gcc comes later since clang emulates gcc)
00082 #if (__GNUC__ > 4 || (__GNUC__ == 4 && __GNUC_MINOR__ >= 5))
00083 #define JSONCPP_DEPRECATED(message) __attribute__((deprecated(message)))
00084 #elif (__GNUC__ > 3 || (__GNUC__ == 3 && __GNUC_MINOR__ >= 1))
00085 #define JSONCPP_DEPRECATED(message) __attribute__((__deprecated__))
00086 #endif                    // GNUC version
00087 #elif defined(_MSC_VER) // MSVC (after clang because clang on Windows emulates
00088 // MSVC)
00089 #define JSONCPP_DEPRECATED(message) __declspec(deprecated(message))
00090 #endif // __clang__ || __GNUC__ || _MSC_VER
00091
00092 #if !defined(JSONCPP_DEPRECATED)
00093 #define JSONCPP_DEPRECATED(message)
00094 #endif // if !defined(JSONCPP_DEPRECATED)
00095
00096 #if defined(__clang__) || (defined(__GNUC__) && (__GNUC__ >= 6))
00097 #define JSON_USE_INT64_DOUBLE_CONVERSION 1
00098 #endif
00099
00100 #if !defined(JSON_IS_AMALGAMATION)
00101
00102 #include "allocator.h"
00103 #include "version.h"
00104
00105 #endif // if !defined(JSON_IS_AMALGAMATION)
00106
00107 namespace Json {
00108 using Int = int;
00109 using UInt = unsigned int;
00110 #if defined(JSON_NO_INT64)
00111 using LargestInt = int;
00112 using LargestUInt = unsigned int;
00113 #undef JSON_HAS_INT64
00114 #else                 // if defined(JSON_NO_INT64)
00115 // For Microsoft Visual use specific types as long long is not supported
00116 #if defined(_MSC_VER) // Microsoft Visual Studio
00117 using Int64 = __int64;
00118 using UInt64 = unsigned __int64;
00119 #else                 // if defined(_MSC_VER) // Other platforms, use long long
00120 using Int64 = int64_t;
00121 using UInt64 = uint64_t;
00122 #endif                // if defined(_MSC_VER)
00123 using LargestInt = Int64;
00124 using LargestUInt = UInt64;
```

```
00125 #define JSON_HAS_INT64
00126 #endif // if defined(JSON_NO_INT64)
00127
00128 template <typename T>
00129 using Allocator =
00130     typename std::conditional<JSONCPP_USING_SECURE_MEMORY, SecureAllocator<T>,
00131     std::allocator<T>>::type;
00132 using String = std::basic_string<char, std::char_traits<char>, Allocator<char>>;
00133 using IStringStream =
00134     std::basic_istringstream<String::value_type, String::traits_type,
00135     String::allocator_type>;
00136 using OStringStream =
00137     std::basic_ostringstream<String::value_type, String::traits_type,
00138     String::allocator_type>;
00139 using IStream = std::istream;
00140 using OStream = std::ostream;
00141 } // namespace Json
00142
00143 // Legacy names (formerly macros).
00144 using JSONCPP_STRING = Json::String;
00145 using JSONCPP_ISTRINGSTREAM = Json::IStringStream;
00146 using JSONCPP_OSTRINGSTREAM = Json::OStringStream;
00147 using JSONCPP_ISTREAM = Json::IStream;
00148 using JSONCPP_OSTREAM = Json::OStream;
00149
00150 #endif // JSON_CONFIG_H_INCLUDED
```

10.9 include/jsoncpp/forwards.h File Reference

```
#include "config.h"
```

Namespaces

- namespace Json

  JSON (JavaScript Object Notation).

Typedefs

- using Json::ArrayIndex = unsigned int

10.10 forwards.h

Go to the documentation of this file.

```
00001 // Copyright 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
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00005
00006 #ifndef JSON_FORWARDS_H_INCLUDED
00007 #define JSON_FORWARDS_H_INCLUDED
00008
00009 #if !defined(JSON_IS_AMALGAMATION)
00010 #include "config.h"
00011 #endif // if !defined(JSON_IS_AMALGAMATION)
00012
00013 namespace Json {
00014
00015 // writer.h
00016 class StreamWriter;
00017 class StreamWriterBuilder;
00018 class Writer;
00019 class FastWriter;
00020 class StyledWriter;
00021 class StyledStreamWriter;
00022
```

```
00023 // reader.h
00024 class Reader;
00025 class CharReader;
00026 class CharReaderBuilder;
00027
00028 // json_features.h
00029 class Features;
00030
00031 // value.h
00032 using ArrayIndex = unsigned int;
00033 class StaticString;
00034 class Path;
00035 class PathArgument;
00036 class Value;
00037 class ValueIteratorBase;
00038 class ValueIterator;
00039 class ValueConstIterator;
00040
00041 } // namespace Json
00042
00043 #endif // JSON_FORWARDS_H_INCLUDED
```

10.11 include/jsoncpp/json.h File Reference

```
#include "config.h"
#include "json_features.h"
#include "reader.h"
#include "value.h"
#include "writer.h"
```

10.12 json.h

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```
00001 // Copyright 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
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00005
00006 #ifndef JSON_JSON_H_INCLUDED
00007 #define JSON_JSON_H_INCLUDED
00008
00009 #include "config.h"
00010 #include "json_features.h"
00011 #include "reader.h"
00012 #include "value.h"
00013 #include "writer.h"
00014
00015 #endif // JSON_JSON_H_INCLUDED
```

10.13 include/jsoncpp/json_features.h File Reference

```
#include "forwards.h"
```

Data Structures

- class Json::Features

  Configuration passed to reader and writer. This configuration object can be used to force the Reader or Writer to behave in a standard conforming way.

Namespaces

- namespace Json

  JSON (JavaScript Object Notation).

10.14 json_features.h

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```
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00005
00006 #ifndef JSON_FEATURES_H_INCLUDED
00007 #define JSON_FEATURES_H_INCLUDED
00008
00009 #if !defined(JSON_IS_AMALGAMATION)
00010 #include "forwards.h"
00011 #endif // if !defined(JSON_IS_AMALGAMATION)
00012
00013 #pragma pack(push)
00014 #pragma pack()
00015
00016 namespace Json {
00017
00022 class JSON_API Features {
00023 public:
00030     static Features all();
00031
00038     static Features strictMode();
00039
00042     Features();
00043
00045     bool allowComments_{true};
00046
00049     bool strictRoot_{false};
00050
00052     bool allowDroppedNullPlaceholders_{false};
00053
00055     bool allowNumericKeys_{false};
00056 };
00057
00058 } // namespace Json
00059
00060 #pragma pack(pop)
00061
00062 #endif // JSON_FEATURES_H_INCLUDED
```

10.15 include/jsoncpp/reader.h File Reference

```
#include "json_features.h"
#include "value.h"
#include <deque>
#include <iosfwd>
#include <istream>
#include <stack>
#include <string>
```

Data Structures

- class Json::Reader

  Unserialize a JSON document into a Value.
- struct Json::Reader::StructuredError

An error tagged with where in the JSON text it was encountered.

- class Json::Reader::Token
- class Json::Reader::ErrorInfo
- class Json::CharReader
- class Json::CharReader::Factory
- class Json::CharReaderBuilder

  Build a CharReader implementation.

Namespaces

- namespace Json

  JSON (JavaScript Object Notation).

Functions

- bool JSON_API Json::parseFromStream (CharReader::Factory const &, IStream &, Value *root, String *errs)
- JSON_API IStream & Json::operator>> (IStream &, Value &)

  Read from 'sin' into 'root'.

10.16 reader.h

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```
00001 // Copyright 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
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00005
00006 #ifndef JSON_READER_H_INCLUDED
00007 #define JSON_READER_H_INCLUDED
00008
00009 #if !defined(JSON_IS_AMALGAMATION)
00010 #include "json_features.h"
00011 #include "value.h"
00012 #endif // if !defined(JSON_IS_AMALGAMATION)
00013 #include <deque>
00014 #include <iosfwd>
00015 #include <istream>
00016 #include <stack>
00017 #include <string>
00018
00019 // Disable warning C4251: <data member>: <type> needs to have dll-interface to
00020 // be used by...
00021 #if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
00022 #pragma warning(push)
00023 #pragma warning(disable : 4251)
00024 #endif // if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
00025
00026 #pragma pack(push)
00027 #pragma pack()
00028
00029 namespace Json {
00030
00037 class JSON_API Reader {
00038 public:
00039     using Char = char;
00040     using Location = const Char*;
00041
00047     struct StructuredError {
00048         ptrdiff_t offset_start;
00049         ptrdiff_t offset_limit;
00050         String message;
00051     };
00052
00056     Reader();
00057
00061     Reader(const Features& features);
00062
```

```
00077     bool parse(const std::string& document, Value& root,
00078                bool collectComments = true);
00079
00096     bool parse(const char* beginDoc, const char* endDoc, Value& root,
00097                bool collectComments = true);
00098
00101     bool parse(IStream& is, Value& root, bool collectComments = true);
00102
00111     JSONCPP_DEPRECATED("Use getFormattedErrorMessages() instead.")
00112     String getFormatedErrorMessages() const;
00113
00121     String getFormattedErrorMessages() const;
00122
00130     std::vector<StructuredError> getStructuredErrors() const;
00131
00139     bool pushError(const Value& value, const String& message);
00140
00149     bool pushError(const Value& value, const String& message, const Value& extra);
00150
00156     bool good() const;
00157
00158 private:
00159     enum TokenType {
00160         tokenEndOfStream = 0,
00161         tokenObjectBegin,
00162         tokenObjectEnd,
00163         tokenArrayBegin,
00164         tokenArrayEnd,
00165         tokenString,
00166         tokenNumber,
00167         tokenTrue,
00168         tokenFalse,
00169         tokenNull,
00170         tokenArraySeparator,
00171         tokenMemberSeparator,
00172         tokenComment,
00173         tokenError
00174     };
00175
00176     class Token {
00177     public:
00178         TokenType type_;
00179         Location start_;
00180         Location end_;
00181     };
00182
00183     class ErrorInfo {
00184     public:
00185         Token token_;
00186         String message_;
00187         Location extra_;
00188     };
00189
00190     using Errors = std::deque<ErrorInfo>;
00191
00192     bool readToken(Token& token);
00193     void skipSpaces();
00194     bool match(const Char* pattern, int patternLength);
00195     bool readComment();
00196     bool readCStyleComment();
00197     bool readCppStyleComment();
00198     bool readString();
00199     void readNumber();
00200     bool readValue();
00201     bool readObject(Token& token);
00202     bool readArray(Token& token);
00203     bool decodeNumber(Token& token);
00204     bool decodeNumber(Token& token, Value& decoded);
00205     bool decodeString(Token& token);
00206     bool decodeString(Token& token, String& decoded);
00207     bool decodeDouble(Token& token);
00208     bool decodeDouble(Token& token, Value& decoded);
00209     bool decodeUnicodeCodePoint(Token& token, Location& current, Location end,
00210                                 unsigned int& unicode);
00211     bool decodeUnicodeEscapeSequence(Token& token, Location& current,
00212                                      Location end, unsigned int& unicode);
00213     bool addError(const String& message, Token& token, Location extra = nullptr);
00214     bool recoverFromError(TokenType skipUntilToken);
00215     bool addErrorAndRecover(const String& message, Token& token,
00216                             TokenType skipUntilToken);
00217     void skipUntilSpace();
00218     Value& currentValue();
00219     Char getNextChar();
00220     void getLocationLineAndColumn(Location location, int& line,
00221                                   int& column) const;
00222     String getLocationLineAndColumn(Location location) const;
00223     void addComment(Location begin, Location end, CommentPlacement placement);
```

```
00224     void skipCommentTokens(Token& token);
00225
00226     static bool containsNewLine(Location begin, Location end);
00227     static String normalizeEOL(Location begin, Location end);
00228
00229     using Nodes = std::stack<Value*>;
00230     Nodes nodes_;
00231     Errors errors_;
00232     String document_;
00233     Location begin_{};
00234     Location end_{};
00235     Location current_{};
00236     Location lastValueEnd_{};
00237     Value* lastValue_{};
00238     String commentsBefore_;
00239     Features features_;
00240     bool collectComments_{};
00241 }; // Reader
00242
00245 class JSON_API CharReader {
00246 public:
00247     virtual ~CharReader() = default;
00264     virtual bool parse(char const* beginDoc, char const* endDoc, Value* root,
00265                        String* errs) = 0;
00266
00267     class JSON_API Factory {
00268     public:
00269         virtual ~Factory() = default;
00273         virtual CharReader* newCharReader() const = 0;
00274     }; // Factory
00275 };   // CharReader
00276
00289 class JSON_API CharReaderBuilder : public CharReader::Factory {
00290 public:
00291     // Note: We use a Json::Value so that we can add data-members to this class
00292     // without a major version bump.
00335     Json::Value settings_;
00336
00337     CharReaderBuilder();
00338     ~CharReaderBuilder() override;
00339
00340     CharReader* newCharReader() const override;
00341
00345     bool validate(Json::Value* invalid) const;
00346
00349     Value& operator[](const String& key);
00350
00356     static void setDefaults(Json::Value* settings);
00362     static void strictMode(Json::Value* settings);
00363 };
00364
00369 bool JSON_API parseFromStream(CharReader::Factory const&, IStream&, Value* root,
00370                               String* errs);
00371
00396 JSON_API IStream& operator>>(IStream&, Value&);
00397
00398 } // namespace Json
00399
00400 #pragma pack(pop)
00401
00402 #if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
00403 #pragma warning(pop)
00404 #endif // if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
00405
00406 #endif // JSON_READER_H_INCLUDED
```

10.17 include/jsoncpp/value.h File Reference

```
#include "forwards.h"
#include <array>
#include <exception>
#include <map>
#include <memory>
#include <string>
#include <vector>
```

Data Structures

- class Json::Exception
- class Json::RuntimeError
- class Json::LogicError
- class Json::StaticString

  Lightweight wrapper to tag static string.
- class Json::Value

  Represents a `JSON` value.
- class Json::Value::CZString
- struct Json::Value::CZString::StringStorage
- union Json::Value::ValueHolder
- class Json::Value::Comments
- class Json::PathArgument

  Experimental and untested: represents an element of the "path" to access a node.
- class Json::Path

  Experimental and untested: represents a "path" to access a node.
- class Json::ValueIteratorBase

  base class for Value iterators.
- class Json::ValueConstIterator

  const iterator for object and array value.
- class Json::ValueIterator

  Iterator for object and array value.

Namespaces

- namespace Json

  JSON (JavaScript Object Notation).

Macros

- #define JSONCPP_NORETURN [[noreturn]]
- #define JSONCPP_TEMPLATE_DELETE = delete

Enumerations

- enum Json::ValueType {
  Json::nullValue = 0 , Json::intValue , Json::uintValue , Json::realValue ,
  Json::stringValue , Json::booleanValue , Json::arrayValue , Json::objectValue }

  Type of the value held by a Value object.
- enum Json::CommentPlacement { Json::commentBefore = 0 , Json::commentAfterOnSameLine ,
  Json::commentAfter , Json::numberOfCommentPlacement }
- enum Json::PrecisionType { Json::significantDigits = 0 , Json::decimalPlaces }

  Type of precision for formatting of real values.

Functions

- JSONCPP_NORETURN void Json::throwRuntimeError (String const &msg)

  used internally
- JSONCPP_NORETURN void Json::throwLogicError (String const &msg)

  used internally
- void Json::swap (Value &a, Value &b)

10.17.1 Macro Definition Documentation

10.17.1.1 JSONCPP_NORETURN

```
#define JSONCPP_NORETURN [[noreturn]]
```

Definition at line 20 of file value.h.

10.17.1.2 JSONCPP_TEMPLATE_DELETE

```
#define JSONCPP_TEMPLATE_DELETE = delete
```

Definition at line 38 of file value.h.

10.18 value.h

Go to the documentation of this file.

```
00001 // Copyright 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
00002 // Distributed under MIT license, or public domain if desired and
00003 // recognized in your jurisdiction.
00004 // See file LICENSE for detail or copy at http://jsoncpp.sourceforge.net/LICENSE
00005
00006 #ifndef JSON_H_INCLUDED
00007 #define JSON_H_INCLUDED
00008
00009 #if !defined(JSON_IS_AMALGAMATION)
00010 #include "forwards.h"
00011 #endif // if !defined(JSON_IS_AMALGAMATION)
00012
00013 // Conditional NORETURN attribute on the throw functions would:
00014 // a) suppress false positives from static code analysis
00015 // b) possibly improve optimization opportunities.
00016 #if !defined(JSONCPP_NORETURN)
00017 #if defined(_MSC_VER) && _MSC_VER == 1800
00018 #define JSONCPP_NORETURN __declspec(noreturn)
00019 #else
00020 #define JSONCPP_NORETURN [[noreturn]]
00021 #endif
00022 #endif
00023
00024 // Support for '= delete' with template declarations was a late addition
00025 // to the c++11 standard and is rejected by clang 3.8 and Apple clang 8.2
00026 // even though these declare themselves to be c++11 compilers.
00027 #if !defined(JSONCPP_TEMPLATE_DELETE)
00028 #if defined(__clang__) && defined(__apple_build_version__)
00029 #if __apple_build_version__ <= 8000042
00030 #define JSONCPP_TEMPLATE_DELETE
00031 #endif
00032 #elif defined(__clang__)
00033 #if __clang_major__ == 3 && __clang_minor__ <= 8
00034 #define JSONCPP_TEMPLATE_DELETE
00035 #endif
00036 #endif
00037 #if !defined(JSONCPP_TEMPLATE_DELETE)
00038 #define JSONCPP_TEMPLATE_DELETE = delete
00039 #endif
00040 #endif
00041
00042 #include <array>
00043 #include <exception>
00044 #include <map>
00045 #include <memory>
00046 #include <string>
00047 #include <vector>
00048
00049 // Disable warning C4251: <data member>: <type> needs to have dll-interface to
00050 // be used by...
00051 #if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
00052 #pragma warning(push)
00053 #pragma warning(disable : 4251 4275)
00054 #endif // if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
```

```
00055
00056 #pragma pack(push)
00057 #pragma pack()
00058
00061 namespace Json {
00062
00063 #if JSON_USE_EXCEPTION
00068 class JSON_API Exception : public std::exception {
00069 public:
00070     Exception(String msg);
00071     ~Exception() noexcept override;
00072     char const* what() const noexcept override;
00073
00074 protected:
00075     String msg_;
00076 };
00077
00084 class JSON_API RuntimeError : public Exception {
00085 public:
00086     RuntimeError(String const& msg);
00087 };
00088
00095 class JSON_API LogicError : public Exception {
00096 public:
00097     LogicError(String const& msg);
00098 };
00099 #endif
00100
00102 JSONCPP_NORETURN void throwRuntimeError(String const& msg);
00104 JSONCPP_NORETURN void throwLogicError(String const& msg);
00105
00108 enum ValueType {
00109     nullValue = 0,
00110     intValue,
00111     uintValue,
00112     realValue,
00113     stringValue,
00114     booleanValue,
00115     arrayValue,
00116     objectValue
00117 };
00118
00119 enum CommentPlacement {
00120     commentBefore = 0,
00121     commentAfterOnSameLine,
00122     commentAfter,
00124     numberOfCommentPlacement
00125 };
00126
00129 enum PrecisionType {
00130     significantDigits = 0,
00131     decimalPlaces
00132 };
00133
00148 class JSON_API StaticString {
00149 public:
00150     explicit StaticString(const char* czstring) : c_str_(czstring) {}
00151
00152     operator const char*() const {
00153         return c_str_;
00154     }
00155
00156     const char* c_str() const {
00157         return c_str_;
00158     }
00159
00160 private:
00161     const char* c_str_;
00162 };
00163
00198 class JSON_API Value {
00199     friend class ValueIteratorBase;
00200
00201 public:
00202     using Members = std::vector<String>;
00203     using iterator = ValueIterator;
00204     using const_iterator = ValueConstIterator;
00205     using UInt = Json::UInt;
00206     using Int = Json::Int;
00207 #if defined(JSON_HAS_INT64)
00208     using UInt64 = Json::UInt64;
00209     using Int64 = Json::Int64;
00210 #endif // defined(JSON_HAS_INT64)
00211     using LargestInt = Json::LargestInt;
00212     using LargestUInt = Json::LargestUInt;
00213     using ArrayIndex = Json::ArrayIndex;
00214
```

```
00215     // Required for boost integration, e. g. BOOST_TEST
00216     using value_type = std::string;
00217
00218 #if JSON_USE_NULLREF
00219     // Binary compatibility kludges, do not use.
00220     static const Value& null;
00221     static const Value& nullRef;
00222 #endif
00223
00224     // null and nullRef are deprecated, use this instead.
00225     static Value const& nullSingleton();
00226
00228     static constexpr LargestInt minLargestInt =
00229         LargestInt(~(LargestUInt(-1) / 2));
00231     static constexpr LargestInt maxLargestInt = LargestInt(LargestUInt(-1) / 2);
00233     static constexpr LargestUInt maxLargestUInt = LargestUInt(-1);
00234
00236     static constexpr Int minInt = Int(~(UInt(-1) / 2));
00238     static constexpr Int maxInt = Int(UInt(-1) / 2);
00240     static constexpr UInt maxUInt = UInt(-1);
00241
00242 #if defined(JSON_HAS_INT64)
00244     static constexpr Int64 minInt64 = Int64(~(UInt64(-1) / 2));
00246     static constexpr Int64 maxInt64 = Int64(UInt64(-1) / 2);
00248     static constexpr UInt64 maxUInt64 = UInt64(-1);
00249 #endif // defined(JSON_HAS_INT64)
00251     static constexpr UInt defaultRealPrecision = 17;
00252     // The constant is hard-coded because some compiler have trouble
00253     // converting Value::maxUInt64 to a double correctly (AIX/xlC).
00254     // Assumes that UInt64 is a 64 bits integer.
00255     static constexpr double maxUInt64AsDouble = 18446744073709551615.0;
00256 // Workaround for bug in the NVIDIAs CUDA 9.1 nvcc compiler
00257 // when using gcc and clang backend compilers.  CZString
00258 // cannot be defined as private.  See issue #486
00259 #ifdef __NVCC__
00260 public:
00261 #else
00262 private:
00263 #endif
00264 #ifndef JSONCPP_DOC_EXCLUDE_IMPLEMENTATION
00265     class CZString {
00266     public:
00267         enum DuplicationPolicy { noDuplication = 0, duplicate, duplicateOnCopy };
00268         CZString(ArrayIndex index);
00269         CZString(char const* str, unsigned length, DuplicationPolicy allocate);
00270         CZString(CZString const& other);
00271         CZString(CZString&& other) noexcept;
00272         ~CZString();
00273         CZString& operator=(const CZString& other);
00274         CZString& operator=(CZString&& other) noexcept;
00275
00276         bool operator<(CZString const& other) const;
00277         bool operator==(CZString const& other) const;
00278         ArrayIndex index() const;
00279         // const char* c_str() const; ///< \deprecated
00280         char const* data() const;
00281         unsigned length() const;
00282         bool isStaticString() const;
00283
00284     private:
00285         void swap(CZString& other);
00286
00287         struct StringStorage {
00288             unsigned policy_ : 2;
00289             unsigned length_ : 30; // 1GB max
00290         };
00291
00292         char const* cstr_; // actually, a prefixed string, unless policy is noDup
00293         union {
00294             ArrayIndex index_;
00295             StringStorage storage_;
00296         };
00297     };
00298
00299 public:
00300     typedef std::map<CZString, Value> ObjectValues;
00301 #endif // ifndef JSONCPP_DOC_EXCLUDE_IMPLEMENTATION
00302
00303 public:
00320     Value(ValueType type = nullValue);
00321     Value(Int value);
00322     Value(UInt value);
00323 #if defined(JSON_HAS_INT64)
00324     Value(Int64 value);
00325     Value(UInt64 value);
00326 #endif // if defined(JSON_HAS_INT64)
00327     Value(double value);
```

```
00328     Value(const char* value);
00329     Value(const char* begin, const char* end);
00347     Value(const StaticString& value);
00348     Value(const String& value);
00349     Value(bool value);
00350     Value(std::nullptr_t ptr) = delete;
00351     Value(const Value& other);
00352     Value(Value&& other) noexcept;
00353     ~Value();
00354
00357     Value& operator=(const Value& other);
00358     Value& operator=(Value&& other) noexcept;
00359
00361     void swap(Value& other);
00363     void swapPayload(Value& other);
00364
00366     void copy(const Value& other);
00368     void copyPayload(const Value& other);
00369
00370     ValueType type() const;
00371
00373     bool operator<(const Value& other) const;
00374     bool operator<=(const Value& other) const;
00375     bool operator>=(const Value& other) const;
00376     bool operator>(const Value& other) const;
00377     bool operator==(const Value& other) const;
00378     bool operator!=(const Value& other) const;
00379     int compare(const Value& other) const;
00380
00381     const char* asCString() const;
00382 #if JSONCPP_USING_SECURE_MEMORY
00383     unsigned getCStringLength() const; // Allows you to understand the length of
00384     // the CString
00385 #endif
00386     String asString() const;
00390     bool getString(char const** begin, char const** end) const;
00391     Int asInt() const;
00392     UInt asUInt() const;
00393 #if defined(JSON_HAS_INT64)
00394     Int64 asInt64() const;
00395     UInt64 asUInt64() const;
00396 #endif // if defined(JSON_HAS_INT64)
00397     LargestInt asLargestInt() const;
00398     LargestUInt asLargestUInt() const;
00399     float asFloat() const;
00400     double asDouble() const;
00401     bool asBool() const;
00402
00403     bool isNull() const;
00404     bool isBool() const;
00405     bool isInt() const;
00406     bool isInt64() const;
00407     bool isUInt() const;
00408     bool isUInt64() const;
00409     bool isIntegral() const;
00410     bool isDouble() const;
00411     bool isNumeric() const;
00412     bool isString() const;
00413     bool isArray() const;
00414     bool isObject() const;
00415
00417     template <typename T> T as() const JSONCPP_TEMPLATE_DELETE;
00418     template <typename T> bool is() const JSONCPP_TEMPLATE_DELETE;
00419
00420     bool isConvertibleTo(ValueType other) const;
00421
00423     ArrayIndex size() const;
00424
00427     bool empty() const;
00428
00430     explicit operator bool() const;
00431
00435     void clear();
00436
00442     void resize(ArrayIndex newSize);
00443
00450     Value& operator[](ArrayIndex index);
00451     Value& operator[](int index);
00453
00458     const Value& operator[](ArrayIndex index) const;
00459     const Value& operator[](int index) const;
00461
00464     Value get(ArrayIndex index, const Value& defaultValue) const;
00466     bool isValidIndex(ArrayIndex index) const;
00470     Value& append(const Value& value);
00471     Value& append(Value&& value);
00472
```

```
00474     bool insert(ArrayIndex index, const Value& newValue);
00475     bool insert(ArrayIndex index, Value&& newValue);
00476
00480     Value& operator[](const char* key);
00483     const Value& operator[](const char* key) const;
00486     Value& operator[](const String& key);
00490     const Value& operator[](const String& key) const;
00503     Value& operator[](const StaticString& key);
00506     Value get(const char* key, const Value& defaultValue) const;
00510     Value get(const char* begin, const char* end,
00511               const Value& defaultValue) const;
00515     Value get(const String& key, const Value& defaultValue) const;
00519     Value const* find(char const* begin, char const* end) const;
00523     Value* demand(char const* begin, char const* end);
00529     void removeMember(const char* key);
00532     void removeMember(const String& key);
00535     bool removeMember(const char* key, Value* removed);
00542     bool removeMember(String const& key, Value* removed);
00544     bool removeMember(const char* begin, const char* end, Value* removed);
00551     bool removeIndex(ArrayIndex index, Value* removed);
00552
00555     bool isMember(const char* key) const;
00558     bool isMember(const String& key) const;
00560     bool isMember(const char* begin, const char* end) const;
00561
00567     Members getMemberNames() const;
00568
00570     JSONCPP_DEPRECATED("Use setComment(String const&) instead.")
00571     void setComment(const char* comment, CommentPlacement placement) {
00572         setComment(String(comment, strlen(comment)), placement);
00573     }
00575     void setComment(const char* comment, size_t len, CommentPlacement placement) {
00576         setComment(String(comment, len), placement);
00577     }
00579     void setComment(String comment, CommentPlacement placement);
00580     bool hasComment(CommentPlacement placement) const;
00582     String getComment(CommentPlacement placement) const;
00583
00584     String toStyledString() const;
00585
00586     const_iterator begin() const;
00587     const_iterator end() const;
00588
00589     iterator begin();
00590     iterator end();
00591
00594     const Value& front() const;
00595
00598     Value& front();
00599
00602     const Value& back() const;
00603
00606     Value& back();
00607
00608     // Accessors for the [start, limit) range of bytes within the JSON text from
00609     // which this value was parsed, if any.
00610     void setOffsetStart(ptrdiff_t start);
00611     void setOffsetLimit(ptrdiff_t limit);
00612     ptrdiff_t getOffsetStart() const;
00613     ptrdiff_t getOffsetLimit() const;
00614
00615 private:
00616     void setType(ValueType v) {
00617         bits_.value_type_ = static_cast<unsigned char>(v);
00618     }
00619     bool isAllocated() const {
00620         return bits_.allocated_;
00621     }
00622     void setIsAllocated(bool v) {
00623         bits_.allocated_ = v;
00624     }
00625
00626     void initBasic(ValueType type, bool allocated = false);
00627     void dupPayload(const Value& other);
00628     void releasePayload();
00629     void dupMeta(const Value& other);
00630
00631     Value& resolveReference(const char* key);
00632     Value& resolveReference(const char* key, const char* end);
00633
00634     // struct MemberNamesTransform
00635     //{
00636     //   typedef const char *result_type;
00637     //   const char *operator()( const CZString &name ) const
00638     //   {
00639     //      return name.c_str();
00640     //   }
```

```
00641     //};
00642
00643     union ValueHolder {
00644         LargestInt int_;
00645         LargestUInt uint_;
00646         double real_;
00647         bool bool_;
00648         char* string_; // if allocated_, ptr to { unsigned, char[] }.
00649         ObjectValues* map_;
00650     } value_;
00651
00652     struct {
00653         // Really a ValueType, but types should agree for bitfield packing.
00654         unsigned int value_type_ : 8;
00655         // Unless allocated_, string_ must be null-terminated.
00656         unsigned int allocated_ : 1;
00657     } bits_;
00658
00659     class Comments {
00660     public:
00661         Comments() = default;
00662         Comments(const Comments& that);
00663         Comments(Comments&& that) noexcept;
00664         Comments& operator=(const Comments& that);
00665         Comments& operator=(Comments&& that) noexcept;
00666         bool has(CommentPlacement slot) const;
00667         String get(CommentPlacement slot) const;
00668         void set(CommentPlacement slot, String comment);
00669
00670     private:
00671         using Array = std::array<String, numberOfCommentPlacement>;
00672         std::unique_ptr<Array> ptr_;
00673     };
00674     Comments comments_;
00675
00676     // [start, limit) byte offsets in the source JSON text from which this Value
00677     // was extracted.
00678     ptrdiff_t start_;
00679     ptrdiff_t limit_;
00680 };
00681
00682 template <> inline bool Value::as<bool>() const {
00683     return asBool();
00684 }
00685 template <> inline bool Value::is<bool>() const {
00686     return isBool();
00687 }
00688
00689 template <> inline Int Value::as<Int>() const {
00690     return asInt();
00691 }
00692 template <> inline bool Value::is<Int>() const {
00693     return isInt();
00694 }
00695
00696 template <> inline UInt Value::as<UInt>() const {
00697     return asUInt();
00698 }
00699 template <> inline bool Value::is<UInt>() const {
00700     return isUInt();
00701 }
00702
00703 #if defined(JSON_HAS_INT64)
00704 template <> inline Int64 Value::as<Int64>() const {
00705     return asInt64();
00706 }
00707 template <> inline bool Value::is<Int64>() const {
00708     return isInt64();
00709 }
00710
00711 template <> inline UInt64 Value::as<UInt64>() const {
00712     return asUInt64();
00713 }
00714 template <> inline bool Value::is<UInt64>() const {
00715     return isUInt64();
00716 }
00717 #endif
00718
00719 template <> inline double Value::as<double>() const {
00720     return asDouble();
00721 }
00722 template <> inline bool Value::is<double>() const {
00723     return isDouble();
00724 }
00725
00726 template <> inline String Value::as<String>() const {
00727     return asString();
```

```
00728 }
00729 template <> inline bool Value::is<String>() const {
00730     return isString();
00731 }
00732
00735 template <> inline float Value::as<float>() const {
00736     return asFloat();
00737 }
00738 template <> inline const char* Value::as<const char*>() const {
00739     return asCString();
00740 }
00741
00745 class JSON_API PathArgument {
00746 public:
00747     friend class Path;
00748
00749     PathArgument();
00750     PathArgument(ArrayIndex index);
00751     PathArgument(const char* key);
00752     PathArgument(String key);
00753
00754 private:
00755     enum Kind { kindNone = 0, kindIndex, kindKey };
00756     String key_;
00757     ArrayIndex index_{};
00758     Kind kind_{kindNone};
00759 };
00760
00772 class JSON_API Path {
00773 public:
00774     Path(const String& path, const PathArgument& a1 = PathArgument(),
00775          const PathArgument& a2 = PathArgument(),
00776          const PathArgument& a3 = PathArgument(),
00777          const PathArgument& a4 = PathArgument(),
00778          const PathArgument& a5 = PathArgument());
00779
00780     const Value& resolve(const Value& root) const;
00781     Value resolve(const Value& root, const Value& defaultValue) const;
00784     Value& make(Value& root) const;
00785
00786 private:
00787     using InArgs = std::vector<const PathArgument*>;
00788     using Args = std::vector<PathArgument>;
00789
00790     void makePath(const String& path, const InArgs& in);
00791     void addPathInArg(const String& path, const InArgs& in,
00792                       InArgs::const_iterator& itInArg, PathArgument::Kind kind);
00793     static void invalidPath(const String& path, int location);
00794
00795     Args args_;
00796 };
00797
00801 class JSON_API ValueIteratorBase {
00802 public:
00803     using iterator_category = std::bidirectional_iterator_tag;
00804     using size_t = unsigned int;
00805     using difference_type = int;
00806     using SelfType = ValueIteratorBase;
00807
00808     bool operator==(const SelfType& other) const {
00809         return isEqual(other);
00810     }
00811
00812     bool operator!=(const SelfType& other) const {
00813         return !isEqual(other);
00814     }
00815
00816     difference_type operator-(const SelfType& other) const {
00817         return other.computeDistance(*this);
00818     }
00819
00822     Value key() const;
00823
00826     UInt index() const;
00827
00831     String name() const;
00832
00837     JSONCPP_DEPRECATED("Use `key = name();` instead.")
00838     char const* memberName() const;
00842     char const* memberName(char const** end) const;
00843
00844 protected:
00851     const Value& deref() const;
00852     Value& deref();
00853
00854     void increment();
00855
```

```
00856     void decrement();
00857
00858     difference_type computeDistance(const SelfType& other) const;
00859
00860     bool isEqual(const SelfType& other) const;
00861
00862     void copy(const SelfType& other);
00863
00864 private:
00865     Value::ObjectValues::iterator current_;
00866     // Indicates that iterator is for a null value.
00867     bool isNull_{true};
00868
00869 public:
00870     // For some reason, BORLAND needs these at the end, rather
00871     // than earlier. No idea why.
00872     ValueIteratorBase();
00873     explicit ValueIteratorBase(const Value::ObjectValues::iterator& current);
00874 };
00875
00879 class JSON_API ValueConstIterator : public ValueIteratorBase {
00880     friend class Value;
00881
00882 public:
00883     using value_type = const Value;
00884     // typedef unsigned int size_t;
00885     // typedef int difference_type;
00886     using reference = const Value&;
00887     using pointer = const Value*;
00888     using SelfType = ValueConstIterator;
00889
00890     ValueConstIterator();
00891     ValueConstIterator(ValueIterator const& other);
00892
00893 private:
00896     explicit ValueConstIterator(const Value::ObjectValues::iterator& current);
00897
00898 public:
00899     SelfType& operator=(const ValueIteratorBase& other);
00900
00901     SelfType operator++(int) {
00902         SelfType temp(*this);
00903         ++*this;
00904         return temp;
00905     }
00906
00907     SelfType operator--(int) {
00908         SelfType temp(*this);
00909         --*this;
00910         return temp;
00911     }
00912
00913     SelfType& operator--() {
00914         decrement();
00915         return *this;
00916     }
00917
00918     SelfType& operator++() {
00919         increment();
00920         return *this;
00921     }
00922
00923     reference operator*() const {
00924         return deref();
00925     }
00926
00927     pointer operator->() const {
00928         return &deref();
00929     }
00930 };
00931
00934 class JSON_API ValueIterator : public ValueIteratorBase {
00935     friend class Value;
00936
00937 public:
00938     using value_type = Value;
00939     using size_t = unsigned int;
00940     using difference_type = int;
00941     using reference = Value&;
00942     using pointer = Value*;
00943     using SelfType = ValueIterator;
00944
00945     ValueIterator();
00946     explicit ValueIterator(const ValueConstIterator& other);
00947     ValueIterator(const ValueIterator& other);
00948
00949 private:
```

```
00952     explicit ValueIterator(const Value::ObjectValues::iterator& current);
00953
00954 public:
00955     SelfType& operator=(const SelfType& other);
00956
00957     SelfType operator++(int) {
00958         SelfType temp(*this);
00959         ++*this;
00960         return temp;
00961     }
00962
00963     SelfType operator--(int) {
00964         SelfType temp(*this);
00965         --*this;
00966         return temp;
00967     }
00968
00969     SelfType& operator--() {
00970         decrement();
00971         return *this;
00972     }
00973
00974     SelfType& operator++() {
00975         increment();
00976         return *this;
00977     }
00978
00984     reference operator*() const {
00985         return const_cast<reference>(deref());
00986     }
00987     pointer operator->() const {
00988         return const_cast<pointer>(&deref());
00989     }
00990 };
00991
00992 inline void swap(Value& a, Value& b) {
00993     a.swap(b);
00994 }
00995
00996 inline const Value& Value::front() const {
00997     return *begin();
00998 }
00999
01000 inline Value& Value::front() {
01001     return *begin();
01002 }
01003
01004 inline const Value& Value::back() const {
01005     return *(--end());
01006 }
01007
01008 inline Value& Value::back() {
01009     return *(--end());
01010 }
01011
01012 } // namespace Json
01013
01014 #pragma pack(pop)
01015
01016 #if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
01017 #pragma warning(pop)
01018 #endif // if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
01019
01020 #endif // JSON_H_INCLUDED
```

10.19 include/jsoncpp/version.h File Reference

Macros

- #define JSONCPP_VERSION_STRING "1.9.5"
- #define JSONCPP_VERSION_MAJOR 1
- #define JSONCPP_VERSION_MINOR 9
- #define JSONCPP_VERSION_PATCH 5
- #define JSONCPP_VERSION_QUALIFIER
- #define JSONCPP_VERSION_HEXA
- #define JSONCPP_USING_SECURE_MEMORY 0

10.19.1 Macro Definition Documentation

10.19.1.1 JSONCPP_USING_SECURE_MEMORY

```
#define JSONCPP_USING_SECURE_MEMORY 0
```

Definition at line 24 of file version.h.

10.19.1.2 JSONCPP_VERSION_HEXA

```
#define JSONCPP_VERSION_HEXA
```

Value:

```
  ((JSONCPP_VERSION_MAJOR << 24) | (JSONCPP_VERSION_MINOR << 16) |            \
   (JSONCPP_VERSION_PATCH << 8))
```

Definition at line 17 of file version.h.

10.19.1.3 JSONCPP_VERSION_MAJOR

```
#define JSONCPP_VERSION_MAJOR 1
```

Definition at line 13 of file version.h.

10.19.1.4 JSONCPP_VERSION_MINOR

```
#define JSONCPP_VERSION_MINOR 9
```

Definition at line 14 of file version.h.

10.19.1.5 JSONCPP_VERSION_PATCH

```
#define JSONCPP_VERSION_PATCH 5
```

Definition at line 15 of file version.h.

10.19.1.6 JSONCPP_VERSION_QUALIFIER

```
#define JSONCPP_VERSION_QUALIFIER
```

Definition at line 16 of file version.h.

10.19.1.7 JSONCPP_VERSION_STRING

```
#define JSONCPP_VERSION_STRING "1.9.5"
```

Definition at line 12 of file version.h.

10.20 version.h

Go to the documentation of this file.

```
00001 #ifndef JSON_VERSION_H_INCLUDED
00002 #define JSON_VERSION_H_INCLUDED
00003
00004 // Note: version must be updated in three places when doing a release. This
00005 // annoying process ensures that amalgamate, CMake, and meson all report the
00006 // correct version.
00007 // 1. /meson.build
00008 // 2. /include/json/version.h
00009 // 3. /CMakeLists.txt
00010 // IMPORTANT: also update the SOVERSION!!
00011
00012 #define JSONCPP_VERSION_STRING "1.9.5"
00013 #define JSONCPP_VERSION_MAJOR 1
00014 #define JSONCPP_VERSION_MINOR 9
00015 #define JSONCPP_VERSION_PATCH 5
00016 #define JSONCPP_VERSION_QUALIFIER
00017 #define JSONCPP_VERSION_HEXA                                                  \
00018   ((JSONCPP_VERSION_MAJOR << 24) | (JSONCPP_VERSION_MINOR << 16) |            \
00019    (JSONCPP_VERSION_PATCH << 8))
00020
00021 #ifdef JSONCPP_USING_SECURE_MEMORY
00022 #undef JSONCPP_USING_SECURE_MEMORY
00023 #endif
00024 #define JSONCPP_USING_SECURE_MEMORY 0
00025 // If non-zero, the library zeroes any memory that it has allocated before
00026 // it frees its memory.
00027
00028 #endif // JSON_VERSION_H_INCLUDED
```

10.21 include/jsoncpp/writer.h File Reference

```
#include "value.h"
#include <ostream>
#include <string>
#include <vector>
```

Data Structures

- class Json::StreamWriter
- class Json::StreamWriter::Factory

  A simple abstract factory.
- class Json::StreamWriterBuilder

  Build a StreamWriter implementation.
- class Json::Writer

  Abstract class for writers.
- class Json::FastWriter

  Outputs a Value in JSON format without formatting (not human friendly).
- class Json::StyledWriter

  Writes a Value in JSON format in a human friendly way.
- class Json::StyledStreamWriter

  Writes a Value in JSON format in a human friendly way, to a stream rather than to a string.

Namespaces

- namespace Json

  JSON (JavaScript Object Notation).

Functions

- String JSON_API Json::writeString (StreamWriter::Factory const &factory, Value const &root)

  Write into stringstream, then return string, for convenience. A StreamWriter will be created from the factory, used, and then deleted.
- String JSON_API Json::valueToString (Int value)
- String JSON_API Json::valueToString (UInt value)
- String JSON_API Json::valueToString (LargestInt value)
- String JSON_API Json::valueToString (LargestUInt value)
- String JSON_API Json::valueToString (double value, unsigned int precision=Value::defaultRealPrecision, PrecisionType precisionType=PrecisionType::significantDigits)
- String JSON_API Json::valueToString (bool value)
- String JSON_API Json::valueToQuotedString (const char *value)
- JSON_API OStream & Json::operator<< (OStream &, const Value &root)

  Output using the StyledStreamWriter.

10.22 writer.h

Go to the documentation of this file.

```
00001 // Copyright 2007-2010 Baptiste Lepilleur and The JsonCpp Authors
00002 // Distributed under MIT license, or public domain if desired and
00003 // recognized in your jurisdiction.
00004 // See file LICENSE for detail or copy at http://jsoncpp.sourceforge.net/LICENSE
00005
00006 #ifndef JSON_WRITER_H_INCLUDED
00007 #define JSON_WRITER_H_INCLUDED
00008
00009 #if !defined(JSON_IS_AMALGAMATION)
00010 #include "value.h"
00011 #endif // if !defined(JSON_IS_AMALGAMATION)
00012 #include <ostream>
00013 #include <string>
00014 #include <vector>
00015
00016 // Disable warning C4251: <data member>: <type> needs to have dll-interface to
00017 // be used by...
00018 #if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING) && defined(_MSC_VER)
00019 #pragma warning(push)
00020 #pragma warning(disable : 4251)
00021 #endif // if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
00022
00023 #pragma pack(push)
00024 #pragma pack()
00025
00026 namespace Json {
00027
00028 class Value;
00029
00042 class JSON_API StreamWriter {
00043 protected:
00044     OStream* sout_; // not owned; will not delete
00045 public:
00046     StreamWriter();
00047     virtual ~StreamWriter();
00055     virtual int write(Value const& root, OStream* sout) = 0;
00056
00059     class JSON_API Factory {
00060     public:
00061         virtual ~Factory();
00065         virtual StreamWriter* newStreamWriter() const = 0;
00066     }; // Factory
00067 };   // StreamWriter
00068
00072 String JSON_API writeString(StreamWriter::Factory const& factory,
00073                             Value const& root);
00074
00090 class JSON_API StreamWriterBuilder : public StreamWriter::Factory {
00091 public:
00092     // Note: We use a Json::Value so that we can add data-members to this class
00093     // without a major version bump.
00122     Json::Value settings_;
00123
00124     StreamWriterBuilder();
```

```
00125     ~StreamWriterBuilder() override;
00126
00130     StreamWriter* newStreamWriter() const override;
00131
00135     bool validate(Json::Value* invalid) const;
00138     Value& operator[](const String& key);
00139
00145     static void setDefaults(Json::Value* settings);
00146 };
00147
00151 class JSON_API Writer {
00152 public:
00153     virtual ~Writer();
00154
00155     virtual String write(const Value& root) = 0;
00156 };
00157
00167 #if defined(_MSC_VER)
00168 #pragma warning(push)
00169 #pragma warning(disable : 4996) // Deriving from deprecated class
00170 #endif
00171 class JSON_API FastWriter
00172     : public Writer {
00173 public:
00174     FastWriter();
00175     ~FastWriter() override = default;
00176
00177     void enableYAMLCompatibility();
00178
00184     void dropNullPlaceholders();
00185
00186     void omitEndingLineFeed();
00187
00188 public: // overridden from Writer
00189     String write(const Value& root) override;
00190
00191 private:
00192     void writeValue(const Value& value);
00193
00194     String document_;
00195     bool yamlCompatibilityEnabled_{false};
00196     bool dropNullPlaceholders_{false};
00197     bool omitEndingLineFeed_{false};
00198 };
00199 #if defined(_MSC_VER)
00200 #pragma warning(pop)
00201 #endif
00202
00227 #if defined(_MSC_VER)
00228 #pragma warning(push)
00229 #pragma warning(disable : 4996) // Deriving from deprecated class
00230 #endif
00231 class JSON_API
00232     StyledWriter : public Writer {
00233 public:
00234     StyledWriter();
00235     ~StyledWriter() override = default;
00236
00237 public: // overridden from Writer
00242     String write(const Value& root) override;
00243
00244 private:
00245     void writeValue(const Value& value);
00246     void writeArrayValue(const Value& value);
00247     bool isMultilineArray(const Value& value);
00248     void pushValue(const String& value);
00249     void writeIndent();
00250     void writeWithIndent(const String& value);
00251     void indent();
00252     void unindent();
00253     void writeCommentBeforeValue(const Value& root);
00254     void writeCommentAfterValueOnSameLine(const Value& root);
00255     static bool hasCommentForValue(const Value& value);
00256     static String normalizeEOL(const String& text);
00257
00258     using ChildValues = std::vector<String>;
00259
00260     ChildValues childValues_;
00261     String document_;
00262     String indentString_;
00263     unsigned int rightMargin_{74};
00264     unsigned int indentSize_{3};
00265     bool addChildValues_{false};
00266 };
00267 #if defined(_MSC_VER)
00268 #pragma warning(pop)
00269 #endif
```

```
00270
00296 #if defined(_MSC_VER)
00297 #pragma warning(push)
00298 #pragma warning(disable : 4996) // Deriving from deprecated class
00299 #endif
00300 class JSON_API
00301     StyledStreamWriter {
00302 public:
00306     StyledStreamWriter(String indentation = "\t");
00307     ~StyledStreamWriter() = default;
00308
00309 public:
00316     void write(OStream& out, const Value& root);
00317
00318 private:
00319     void writeValue(const Value& value);
00320     void writeArrayValue(const Value& value);
00321     bool isMultilineArray(const Value& value);
00322     void pushValue(const String& value);
00323     void writeIndent();
00324     void writeWithIndent(const String& value);
00325     void indent();
00326     void unindent();
00327     void writeCommentBeforeValue(const Value& root);
00328     void writeCommentAfterValueOnSameLine(const Value& root);
00329     static bool hasCommentForValue(const Value& value);
00330     static String normalizeEOL(const String& text);
00331
00332     using ChildValues = std::vector<String>;
00333
00334     ChildValues childValues_;
00335     OStream* document_;
00336     String indentString_;
00337     unsigned int rightMargin_{74};
00338     String indentation_;
00339     bool addChildValues_ : 1;
00340     bool indented_ : 1;
00341 };
00342 #if defined(_MSC_VER)
00343 #pragma warning(pop)
00344 #endif
00345
00346 #if defined(JSON_HAS_INT64)
00347 String JSON_API valueToString(Int value);
00348 String JSON_API valueToString(UInt value);
00349 #endif // if defined(JSON_HAS_INT64)
00350 String JSON_API valueToString(LargestInt value);
00351 String JSON_API valueToString(LargestUInt value);
00352 String JSON_API valueToString(
00353     double value, unsigned int precision = Value::defaultRealPrecision,
00354     PrecisionType precisionType = PrecisionType::significantDigits);
00355 String JSON_API valueToString(bool value);
00356 String JSON_API valueToQuotedString(const char* value);
00357
00360 JSON_API OStream& operator<<(OStream&, const Value& root);
00361
00362 } // namespace Json
00363
00364 #pragma pack(pop)
00365
00366 #if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
00367 #pragma warning(pop)
00368 #endif // if defined(JSONCPP_DISABLE_DLL_INTERFACE_WARNING)
00369
00370 #endif // JSON_WRITER_H_INCLUDED
```

10.23 lib/easylogging++.cc File Reference

```
#include "easylogging++.h"
```

Data Structures

- struct el::StringToLevelItem
- struct el::ConfigurationStringToTypeItem

Namespaces

- namespace el

  Easylogging++ entry namespace.
- namespace el::base

  Namespace containing base/internal functionality used by Easylogging++.
- namespace el::base::consts

  Namespace containing constants used internally.
- namespace el::base::utils

  Namespace containing utility functions/static classes used internally.
- namespace el::base::threading
- namespace el::base::debug

  Contains some internal debugging tools like crash handler and stack tracer.

Macros

- #define ELPP_DEFAULT_LOGGING_FLAGS 0x0

Functions

- static void el::base::utils::abort (int status, const std::string &reason)

  Aborts application due with user-defined status.
- base::type::ostream_t & el::base::utils::operator<< (base::type::ostream_t &os, const CommandLineArgs &c)

Variables

- static const base::type::char_t * el::base::consts::kInfoLevelLogValue = ELPP_LITERAL("INFO")
- static const base::type::char_t * el::base::consts::kDebugLevelLogValue = ELPP_LITERAL("DEBUG")
- static const base::type::char_t * el::base::consts::kWarningLevelLogValue = ELPP_LITERAL("WARNING")
- static const base::type::char_t * el::base::consts::kErrorLevelLogValue = ELPP_LITERAL("ERROR")
- static const base::type::char_t * el::base::consts::kFatalLevelLogValue = ELPP_LITERAL("FATAL")
- static const base::type::char_t * el::base::consts::kVerboseLevelLogValue
- static const base::type::char_t * el::base::consts::kTraceLevelLogValue = ELPP_LITERAL("TRACE")
- static const base::type::char_t * el::base::consts::kInfoLevelShortLogValue = ELPP_LITERAL("I")
- static const base::type::char_t * el::base::consts::kDebugLevelShortLogValue = ELPP_LITERAL("D")
- static const base::type::char_t * el::base::consts::kWarningLevelShortLogValue = ELPP_LITERAL("W")
- static const base::type::char_t * el::base::consts::kErrorLevelShortLogValue = ELPP_LITERAL("E")
- static const base::type::char_t * el::base::consts::kFatalLevelShortLogValue = ELPP_LITERAL("F")
- static const base::type::char_t * el::base::consts::kVerboseLevelShortLogValue = ELPP_LITERAL("V")
- static const base::type::char_t * el::base::consts::kTraceLevelShortLogValue = ELPP_LITERAL("T")
- static const base::type::char_t * el::base::consts::kAppNameFormatSpecifier = ELPP_LITERAL("%app")
- static const base::type::char_t * el::base::consts::kLoggerIdFormatSpecifier = ELPP_LITERAL("%logger")
- static const base::type::char_t * el::base::consts::kThreadIdFormatSpecifier = ELPP_LITERAL("%thread")
- static const base::type::char_t * el::base::consts::kSeverityLevelFormatSpecifier = ELPP_LITERAL("%level")
- static const base::type::char_t * el::base::consts::kSeverityLevelShortFormatSpecifier = ELPP_LITERAL("%levshort")
- static const base::type::char_t * el::base::consts::kDateTimeFormatSpecifier = ELPP_LITERAL("%datetime")
- static const base::type::char_t * el::base::consts::kLogFileFormatSpecifier = ELPP_LITERAL("%file")
- static const base::type::char_t * el::base::consts::kLogFileBaseFormatSpecifier = ELPP_LITERAL("%fbase")
- static const base::type::char_t * el::base::consts::kLogLineFormatSpecifier = ELPP_LITERAL("%line")
- static const base::type::char_t * el::base::consts::kLogLocationFormatSpecifier = ELPP_LITERAL("%loc")

- static const base::type::char_t * el::base::consts::kLogFunctionFormatSpecifier = ELPP_LITERAL("%func")
- static const base::type::char_t * el::base::consts::kCurrentUserFormatSpecifier = ELPP_LITERAL("%user")
- static const base::type::char_t * el::base::consts::kCurrentHostFormatSpecifier = ELPP_LITERAL("%host")
- static const base::type::char_t * el::base::consts::kMessageFormatSpecifier = ELPP_LITERAL("%msg")
- static const base::type::char_t * el::base::consts::kVerboseLevelFormatSpecifier = ELPP_LITERAL("%vlevel")
- static const char * el::base::consts::kDateTimeFormatSpecifierForFilename = "%datetime"
- static const char * el::base::consts::kDays [7] = { "Sunday", "Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday" }
- static const char * el::base::consts::kDaysAbbrev [7] = { "Sun", "Mon", "Tue", "Wed", "Thu", "Fri", "Sat" }
- static const char * el::base::consts::kMonths [12]
- static const char * el::base::consts::kMonthsAbbrev [12] = { "Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep", "Oct", "Nov", "Dec" }
- static const char * el::base::consts::kDefaultDateTimeFormat = "%Y-%M-%d %H:%m:%s,%g"
- static const char * el::base::consts::kDefaultDateTimeFormatInFilename = "%Y-%M-%d_%H-%m"
- static const int el::base::consts::kYearBase = 1900
- static const char * el::base::consts::kAm = "AM"
- static const char * el::base::consts::kPm = "PM"
- static const char * el::base::consts::kNullPointer = "nullptr"
- static const base::type::VerboseLevel el::base::consts::kMaxVerboseLevel = 9
- static const char * el::base::consts::kUnknownUser = "unknown-user"
- static const char * el::base::consts::kUnknownHost = "unknown-host"
- static const char * el::base::consts::kDefaultLogFile = "myeasylog.log"
- static const char * el::base::consts::kDefaultLogFileParam = "--default-log-file"
- static const char * el::base::consts::kValidLoggerIdSymbols
- static const char * el::base::consts::kConfigurationComment = "##"
- static const char * el::base::consts::kConfigurationLevel = "*"
- static const char * el::base::consts::kConfigurationLoggerId = "--"
- static struct StringToLevelItem el::stringToLevelMap [ ]
- static struct ConfigurationStringToTypeItem el::configStringToTypeMap [ ]

10.23.1 Macro Definition Documentation

10.23.1.1 ELPP_DEFAULT_LOGGING_FLAGS

```
#define ELPP_DEFAULT_LOGGING_FLAGS 0x0
```

Definition at line 2055 of file easylogging++.cc.

10.24 easylogging++.cc

Go to the documentation of this file.

```
00001 //
00002 //  Bismillah ar-Rahmaan ar-Raheem
00003 //
00004 //  Easylogging++ v9.97.1
00005 //  Cross-platform logging library for C++ applications
00006 //
00007 //  Copyright (c) 2012-present @abumq (Majid Q.)
00008 //
00009 //  This library is released under the MIT Licence.
00010 //  https://github.com/amrayn/easyloggingpp/blob/master/LICENSE
00011 //
00012
00013 #include "easylogging++.h"
00014
00015 #if defined(AUTO_INITIALIZE_EASYLOGGINGPP)
00016 INITIALIZE_EASYLOGGINGPP
```

```
00017 #endif
00018
00019 namespace el {
00020
00021 // el::base
00022 namespace base {
00023 // el::base::consts
00024 namespace consts {
00025
00026 // Level log values - These are values that are replaced in place of %level format specifier
00027 // Extra spaces after format specifiers are only for readability purposes in log files
00028 static const base::type::char_t* kInfoLevelLogValue     =   ELPP_LITERAL("INFO");
00029 static const base::type::char_t* kDebugLevelLogValue    =   ELPP_LITERAL("DEBUG");
00030 static const base::type::char_t* kWarningLevelLogValue  =   ELPP_LITERAL("WARNING");
00031 static const base::type::char_t* kErrorLevelLogValue    =   ELPP_LITERAL("ERROR");
00032 static const base::type::char_t* kFatalLevelLogValue    =   ELPP_LITERAL("FATAL");
00033 static const base::type::char_t* kVerboseLevelLogValue  =
00034   ELPP_LITERAL("VERBOSE"); // will become VERBOSE-x where x = verbose level
00035 static const base::type::char_t* kTraceLevelLogValue    =   ELPP_LITERAL("TRACE");
00036 static const base::type::char_t* kInfoLevelShortLogValue     =   ELPP_LITERAL("I");
00037 static const base::type::char_t* kDebugLevelShortLogValue    =   ELPP_LITERAL("D");
00038 static const base::type::char_t* kWarningLevelShortLogValue  =   ELPP_LITERAL("W");
00039 static const base::type::char_t* kErrorLevelShortLogValue    =   ELPP_LITERAL("E");
00040 static const base::type::char_t* kFatalLevelShortLogValue    =   ELPP_LITERAL("F");
00041 static const base::type::char_t* kVerboseLevelShortLogValue  =   ELPP_LITERAL("V");
00042 static const base::type::char_t* kTraceLevelShortLogValue    =   ELPP_LITERAL("T");
00043 // Format specifiers - These are used to define log format
00044 static const base::type::char_t* kAppNameFormatSpecifier          =      ELPP_LITERAL("%app");
00045 static const base::type::char_t* kLoggerIdFormatSpecifier         =      ELPP_LITERAL("%logger");
00046 static const base::type::char_t* kThreadIdFormatSpecifier         =      ELPP_LITERAL("%thread");
00047 static const base::type::char_t* kSeverityLevelFormatSpecifier    =      ELPP_LITERAL("%level");
00048 static const base::type::char_t* kSeverityLevelShortFormatSpecifier    =
      ELPP_LITERAL("%levshort");
00049 static const base::type::char_t* kDateTimeFormatSpecifier         =      ELPP_LITERAL("%datetime");
00050 static const base::type::char_t* kLogFileFormatSpecifier          =      ELPP_LITERAL("%file");
00051 static const base::type::char_t* kLogFileBaseFormatSpecifier      =      ELPP_LITERAL("%fbase");
00052 static const base::type::char_t* kLogLineFormatSpecifier          =      ELPP_LITERAL("%line");
00053 static const base::type::char_t* kLogLocationFormatSpecifier      =      ELPP_LITERAL("%loc");
00054 static const base::type::char_t* kLogFunctionFormatSpecifier      =      ELPP_LITERAL("%func");
00055 static const base::type::char_t* kCurrentUserFormatSpecifier      =      ELPP_LITERAL("%user");
00056 static const base::type::char_t* kCurrentHostFormatSpecifier      =      ELPP_LITERAL("%host");
00057 static const base::type::char_t* kMessageFormatSpecifier          =      ELPP_LITERAL("%msg");
00058 static const base::type::char_t* kVerboseLevelFormatSpecifier     =      ELPP_LITERAL("%vlevel");
00059 static const char* kDateTimeFormatSpecifierForFilename            =      "%datetime";
00060 // Date/time
00061 static const char* kDays[7]                           =      { "Sunday", "Monday", "Tuesday",
      "Wednesday", "Thursday", "Friday", "Saturday" };
00062 static const char* kDaysAbbrev[7]                     =      { "Sun", "Mon", "Tue", "Wed", "Thu", "Fri",
      "Sat" };
00063 static const char* kMonths[12]                        =      { "January", "February", "March", "April",
      "May", "June", "July", "August",
00064                                                                  "September", "October", "November",
      "December"
00065                                                                 };
00066 static const char* kMonthsAbbrev[12]                  =      { "Jan", "Feb", "Mar", "Apr", "May", "Jun",
      "Jul", "Aug", "Sep", "Oct", "Nov", "Dec" };
00067 static const char* kDefaultDateTimeFormat             =      "%Y-%M-%d %H:%m:%s,%g";
00068 static const char* kDefaultDateTimeFormatInFilename   =      "%Y-%M-%d_%H-%m";
00069 static const int kYearBase                            =      1900;
00070 static const char* kAm                                =      "AM";
00071 static const char* kPm                                =      "PM";
00072 // Miscellaneous constants
00073
00074 static const char* kNullPointer                             =      "nullptr";
00075 #if ELPP_VARIADIC_TEMPLATES_SUPPORTED
00076 #endif  // ELPP_VARIADIC_TEMPLATES_SUPPORTED
00077 static const base::type::VerboseLevel kMaxVerboseLevel      =      9;
00078 static const char* kUnknownUser                             =      "unknown-user";
00079 static const char* kUnknownHost                             =      "unknown-host";
00080
00081
00082 //---------------- DEFAULT LOG FILE -----------------------
00083
00084 #if defined(ELPP_NO_DEFAULT_LOG_FILE)
00085 #  if ELPP_OS_UNIX
00086 static const char* kDefaultLogFile                          =      "/dev/null";
00087 #  elif ELPP_OS_WINDOWS
00088 static const char* kDefaultLogFile                          =      "nul";
00089 #  endif  // ELPP_OS_UNIX
00090 #elif defined(ELPP_DEFAULT_LOG_FILE)
00091 static const char* kDefaultLogFile                          =      ELPP_DEFAULT_LOG_FILE;
00092 #else
00093 static const char* kDefaultLogFile                          =      "myeasylog.log";
00094 #endif // defined(ELPP_NO_DEFAULT_LOG_FILE)
00095
00096
00097 #if !defined(ELPP_DISABLE_LOG_FILE_FROM_ARG)
```

```
00098 static const char* kDefaultLogFileParam                    =      "--default-log-file";
00099 #endif  // !defined(ELPP_DISABLE_LOG_FILE_FROM_ARG)
00100 #if defined(ELPP_LOGGING_FLAGS_FROM_ARG)
00101 static const char* kLoggingFlagsParam                        =      "--logging-flags";
00102 #endif  // defined(ELPP_LOGGING_FLAGS_FROM_ARG)
00103 static const char* kValidLoggerIdSymbols                     =
00104   "abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789-._";
00105 static const char* kConfigurationComment                     =      "##";
00106 static const char* kConfigurationLevel                       =      "*";
00107 static const char* kConfigurationLoggerId                    =      "--";
00108 }
00109 // el::base::utils
00110 namespace utils {
00111
00113 static void abort(int status, const std::string& reason) {
00114   // Both status and reason params are there for debugging with tools like gdb etc
00115   ELPP_UNUSED(status);
00116   ELPP_UNUSED(reason);
00117 #if defined(ELPP_COMPILER_MSVC) && defined(_M_IX86) && defined(_DEBUG)
00118   // Ignore msvc critical error dialog - break instead (on debug mode)
00119   _asm int 3
00120 #else
00121   ::abort();
00122 #endif  // defined(ELPP_COMPILER_MSVC) && defined(_M_IX86) && defined(_DEBUG)
00123 }
00124
00125 } // namespace utils
00126 } // namespace base
00127
00128 // el
00129
00130 // LevelHelper
00131
00132 const char* LevelHelper::convertToString(Level level) {
00133   // Do not use switch over strongly typed enums because Intel C++ compilers dont support them yet.
00134   if (level == Level::Global) return "GLOBAL";
00135   if (level == Level::Debug) return "DEBUG";
00136   if (level == Level::Info) return "INFO";
00137   if (level == Level::Warning) return "WARNING";
00138   if (level == Level::Error) return "ERROR";
00139   if (level == Level::Fatal) return "FATAL";
00140   if (level == Level::Verbose) return "VERBOSE";
00141   if (level == Level::Trace) return "TRACE";
00142   return "UNKNOWN";
00143 }
00144
00145 struct StringToLevelItem {
00146   const char* levelString;
00147   Level level;
00148 };
00149
00150 static struct StringToLevelItem stringToLevelMap[] = {
00151   { "global", Level::Global },
00152   { "debug", Level::Debug },
00153   { "info", Level::Info },
00154   { "warning", Level::Warning },
00155   { "error", Level::Error },
00156   { "fatal", Level::Fatal },
00157   { "verbose", Level::Verbose },
00158   { "trace", Level::Trace }
00159 };
00160
00161 Level LevelHelper::convertFromString(const char* levelStr) {
00162   for (auto& item : stringToLevelMap) {
00163     if (base::utils::Str::cStringCaseEq(levelStr, item.levelString)) {
00164       return item.level;
00165     }
00166   }
00167   return Level::Unknown;
00168 }
00169
00170 void LevelHelper::forEachLevel(base::type::EnumType* startIndex, const std::function<bool(void)>& fn)
      {
00171   base::type::EnumType lIndexMax = LevelHelper::kMaxValid;
00172   do {
00173     if (fn()) {
00174       break;
00175     }
00176     *startIndex = static_cast<base::type::EnumType>(*startIndex « 1);
00177   } while (*startIndex <= lIndexMax);
00178 }
00179
00180 // ConfigurationTypeHelper
00181
00182 const char* ConfigurationTypeHelper::convertToString(ConfigurationType configurationType) {
00183   // Do not use switch over strongly typed enums because Intel C++ compilers dont support them yet.
00184   if (configurationType == ConfigurationType::Enabled) return "ENABLED";
```

```
00185   if (configurationType == ConfigurationType::Filename) return "FILENAME";
00186   if (configurationType == ConfigurationType::Format) return "FORMAT";
00187   if (configurationType == ConfigurationType::ToFile) return "TO_FILE";
00188   if (configurationType == ConfigurationType::ToStandardOutput) return "TO_STANDARD_OUTPUT";
00189   if (configurationType == ConfigurationType::SubsecondPrecision) return "SUBSECOND_PRECISION";
00190   if (configurationType == ConfigurationType::PerformanceTracking) return "PERFORMANCE_TRACKING";
00191   if (configurationType == ConfigurationType::MaxLogFileSize) return "MAX_LOG_FILE_SIZE";
00192   if (configurationType == ConfigurationType::LogFlushThreshold) return "LOG_FLUSH_THRESHOLD";
00193   return "UNKNOWN";
00194 }
00195
00196 struct ConfigurationStringToTypeItem {
00197   const char* configString;
00198   ConfigurationType configType;
00199 };
00200
00201 static struct ConfigurationStringToTypeItem configStringToTypeMap[] = {
00202   { "enabled", ConfigurationType::Enabled },
00203   { "to_file", ConfigurationType::ToFile },
00204   { "to_standard_output", ConfigurationType::ToStandardOutput },
00205   { "format", ConfigurationType::Format },
00206   { "filename", ConfigurationType::Filename },
00207   { "subsecond_precision", ConfigurationType::SubsecondPrecision },
00208   { "milliseconds_width", ConfigurationType::MillisecondsWidth },
00209   { "performance_tracking", ConfigurationType::PerformanceTracking },
00210   { "max_log_file_size", ConfigurationType::MaxLogFileSize },
00211   { "log_flush_threshold", ConfigurationType::LogFlushThreshold },
00212 };
00213
00214 ConfigurationType ConfigurationTypeHelper::convertFromString(const char* configStr) {
00215   for (auto& item : configStringToTypeMap) {
00216     if (base::utils::Str::cStringCaseEq(configStr, item.configString)) {
00217       return item.configType;
00218     }
00219   }
00220   return ConfigurationType::Unknown;
00221 }
00222
00223 void ConfigurationTypeHelper::forEachConfigType(base::type::EnumType* startIndex, const
      std::function<bool(void)>& fn) {
00224   base::type::EnumType cIndexMax = ConfigurationTypeHelper::kMaxValid;
00225   do {
00226     if (fn()) {
00227       break;
00228     }
00229     *startIndex = static_cast<base::type::EnumType>(*startIndex « 1);
00230   } while (*startIndex <= cIndexMax);
00231 }
00232
00233 // Configuration
00234
00235 Configuration::Configuration(const Configuration& c) :
00236   m_level(c.m_level),
00237   m_configurationType(c.m_configurationType),
00238   m_value(c.m_value) {
00239 }
00240
00241 Configuration& Configuration::operator=(const Configuration& c) {
00242   if (&c != this) {
00243     m_level = c.m_level;
00244     m_configurationType = c.m_configurationType;
00245     m_value = c.m_value;
00246   }
00247   return *this;
00248 }
00249
00251 Configuration::Configuration(Level level, ConfigurationType configurationType, const std::string&
      value) :
00252   m_level(level),
00253   m_configurationType(configurationType),
00254   m_value(value) {
00255 }
00256
00257 void Configuration::log(el::base::type::ostream_t& os) const {
00258   os « LevelHelper::convertToString(m_level)
00259      « ELPP_LITERAL(" ") « ConfigurationTypeHelper::convertToString(m_configurationType)
00260      « ELPP_LITERAL(" = ") « m_value.c_str();
00261 }
00262
00264 Configuration::Predicate::Predicate(Level level, ConfigurationType configurationType) :
00265   m_level(level),
00266   m_configurationType(configurationType) {
00267 }
00268
00269 bool Configuration::Predicate::operator()(const Configuration* conf) const {
00270   return ((conf != nullptr) && (conf->level() == m_level) && (conf->configurationType() ==
      m_configurationType));
```

```
00271 }
00272
00273 // Configurations
00274
00275 Configurations::Configurations(void) :
00276   m_configurationFile(std::string()),
00277   m_isFromFile(false) {
00278 }
00279
00280 Configurations::Configurations(const std::string& configurationFile, bool useDefaultsForRemaining,
00281                                Configurations* base) :
00282   m_configurationFile(configurationFile),
00283   m_isFromFile(false) {
00284   parseFromFile(configurationFile, base);
00285   if (useDefaultsForRemaining) {
00286     setRemainingToDefault();
00287   }
00288 }
00289
00290 bool Configurations::parseFromFile(const std::string& configurationFile, Configurations* base) {
00291   // We initial assertion with true because if we have assertion disabled, we want to pass this
00292   // check and if assertion is enabled we will have values re-assigned any way.
00293   bool assertionPassed = true;
00294   ELPP_ASSERT((assertionPassed = base::utils::File::pathExists(configurationFile.c_str(), true)) ==
      true,
00295               "Configuration file [" << configurationFile << "] does not exist!");
00296   if (!assertionPassed) {
00297     return false;
00298   }
00299   bool success = Parser::parseFromFile(configurationFile, this, base);
00300   m_isFromFile = success;
00301   return success;
00302 }
00303
00304 bool Configurations::parseFromText(const std::string& configurationsString, Configurations* base) {
00305   bool success = Parser::parseFromText(configurationsString, this, base);
00306   if (success) {
00307     m_isFromFile = false;
00308   }
00309   return success;
00310 }
00311
00312 void Configurations::setFromBase(Configurations* base) {
00313   if (base == nullptr || base == this) {
00314     return;
00315   }
00316   base::threading::ScopedLock scopedLock(base->lock());
00317   for (Configuration*& conf : base->list()) {
00318     set(conf);
00319   }
00320 }
00321
00322 bool Configurations::hasConfiguration(ConfigurationType configurationType) {
00323   base::type::EnumType lIndex = LevelHelper::kMinValid;
00324   bool result = false;
00325   LevelHelper::forEachLevel(&lIndex, [&](void) -> bool {
00326     if (hasConfiguration(LevelHelper::castFromInt(lIndex), configurationType)) {
00327       result = true;
00328     }
00329     return result;
00330   });
00331   return result;
00332 }
00333
00334 bool Configurations::hasConfiguration(Level level, ConfigurationType configurationType) {
00335   base::threading::ScopedLock scopedLock(lock());
00336 #if ELPP_COMPILER_INTEL
00337   // We cant specify template types here, Intel C++ throws compilation error
00338   // "error: type name is not allowed"
00339   return RegistryWithPred::get(level, configurationType) != nullptr;
00340 #else
00341   return RegistryWithPred<Configuration, Configuration::Predicate>::get(level, configurationType) !=
      nullptr;
00342 #endif  // ELPP_COMPILER_INTEL
00343 }
00344
00345 void Configurations::set(Level level, ConfigurationType configurationType, const std::string& value) {
00346   base::threading::ScopedLock scopedLock(lock());
00347   unsafeSet(level, configurationType, value);  // This is not unsafe anymore as we have locked mutex
00348   if (level == Level::Global) {
00349     unsafeSetGlobally(configurationType, value, false);  // Again this is not unsafe either
00350   }
00351 }
00352
00353 void Configurations::set(Configuration* conf) {
00354   if (conf == nullptr) {
00355     return;
```

```
00356   }
00357   set(conf->level(), conf->configurationType(), conf->value());
00358 }
00359
00360 void Configurations::setToDefault(void) {
00361   setGlobally(ConfigurationType::Enabled, std::string("true"), true);
00362   setGlobally(ConfigurationType::Filename, std::string(base::consts::kDefaultLogFile), true);
00363 #if defined(ELPP_NO_LOG_TO_FILE)
00364   setGlobally(ConfigurationType::ToFile, std::string("false"), true);
00365 #else
00366   setGlobally(ConfigurationType::ToFile, std::string("true"), true);
00367 #endif // defined(ELPP_NO_LOG_TO_FILE)
00368   setGlobally(ConfigurationType::ToStandardOutput, std::string("true"), true);
00369   setGlobally(ConfigurationType::SubsecondPrecision, std::string("3"), true);
00370   setGlobally(ConfigurationType::PerformanceTracking, std::string("true"), true);
00371   setGlobally(ConfigurationType::MaxLogFileSize, std::string("0"), true);
00372   setGlobally(ConfigurationType::LogFlushThreshold, std::string("0"), true);
00373
00374   setGlobally(ConfigurationType::Format, std::string("%datetime %level [%logger] %msg"), true);
00375   set(Level::Debug, ConfigurationType::Format,
00376       std::string("%datetime %level [%logger] [%user@%host] [%func] [%loc] %msg"));
00377   // INFO and WARNING are set to default by Level::Global
00378   set(Level::Error, ConfigurationType::Format, std::string("%datetime %level [%logger] %msg"));
00379   set(Level::Fatal, ConfigurationType::Format, std::string("%datetime %level [%logger] %msg"));
00380   set(Level::Verbose, ConfigurationType::Format, std::string("%datetime %level-%vlevel [%logger]
      %msg"));
00381   set(Level::Trace, ConfigurationType::Format, std::string("%datetime %level [%logger] [%func] [%loc]
      %msg"));
00382 }
00383
00384 void Configurations::setRemainingToDefault(void) {
00385   base::threading::ScopedLock scopedLock(lock());
00386 #if defined(ELPP_NO_LOG_TO_FILE)
00387   unsafeSetIfNotExist(Level::Global, ConfigurationType::Enabled, std::string("false"));
00388 #else
00389   unsafeSetIfNotExist(Level::Global, ConfigurationType::Enabled, std::string("true"));
00390 #endif // defined(ELPP_NO_LOG_TO_FILE)
00391   unsafeSetIfNotExist(Level::Global, ConfigurationType::Filename,
      std::string(base::consts::kDefaultLogFile));
00392   unsafeSetIfNotExist(Level::Global, ConfigurationType::ToStandardOutput, std::string("true"));
00393   unsafeSetIfNotExist(Level::Global, ConfigurationType::SubsecondPrecision, std::string("3"));
00394   unsafeSetIfNotExist(Level::Global, ConfigurationType::PerformanceTracking, std::string("true"));
00395   unsafeSetIfNotExist(Level::Global, ConfigurationType::MaxLogFileSize, std::string("0"));
00396   unsafeSetIfNotExist(Level::Global, ConfigurationType::Format, std::string("%datetime %level
      [%logger] %msg"));
00397   unsafeSetIfNotExist(Level::Debug, ConfigurationType::Format,
00398                       std::string("%datetime %level [%logger] [%user@%host] [%func] [%loc] %msg"));
00399   // INFO and WARNING are set to default by Level::Global
00400   unsafeSetIfNotExist(Level::Error, ConfigurationType::Format, std::string("%datetime %level [%logger]
      %msg"));
00401   unsafeSetIfNotExist(Level::Fatal, ConfigurationType::Format, std::string("%datetime %level [%logger]
      %msg"));
00402   unsafeSetIfNotExist(Level::Verbose, ConfigurationType::Format, std::string("%datetime %level-%vlevel
      [%logger] %msg"));
00403   unsafeSetIfNotExist(Level::Trace, ConfigurationType::Format,
00404                       std::string("%datetime %level [%logger] [%func] [%loc] %msg"));
00405 }
00406
00407 bool Configurations::Parser::parseFromFile(const std::string& configurationFile, Configurations*
      sender,
00408     Configurations* base) {
00409   sender->setFromBase(base);
00410   std::ifstream fileStream_(configurationFile.c_str(), std::ifstream::in);
00411   ELPP_ASSERT(fileStream_.is_open(), "Unable to open configuration file [" << configurationFile << "]
      for parsing.");
00412   bool parsedSuccessfully = false;
00413   std::string line = std::string();
00414   Level currLevel = Level::Unknown;
00415   std::string currConfigStr = std::string();
00416   std::string currLevelStr = std::string();
00417   while (fileStream_.good()) {
00418     std::getline(fileStream_, line);
00419     parsedSuccessfully = parseLine(&line, &currConfigStr, &currLevelStr, &currLevel, sender);
00420     ELPP_ASSERT(parsedSuccessfully, "Unable to parse configuration line: " << line);
00421   }
00422   return parsedSuccessfully;
00423 }
00424
00425 bool Configurations::Parser::parseFromText(const std::string& configurationsString, Configurations*
      sender,
00426     Configurations* base) {
00427   sender->setFromBase(base);
00428   bool parsedSuccessfully = false;
00429   std::stringstream ss(configurationsString);
00430   std::string line = std::string();
00431   Level currLevel = Level::Unknown;
00432   std::string currConfigStr = std::string();
```

```
00433   std::string currLevelStr = std::string();
00434   while (std::getline(ss, line)) {
00435     parsedSuccessfully = parseLine(&line, &currConfigStr, &currLevelStr, &currLevel, sender);
00436     ELPP_ASSERT(parsedSuccessfully, "Unable to parse configuration line: " << line);
00437   }
00438   return parsedSuccessfully;
00439 }
00440
00441 void Configurations::Parser::ignoreComments(std::string* line) {
00442   std::size_t foundAt = 0;
00443   std::size_t quotesStart = line->find("\"");
00444   std::size_t quotesEnd = std::string::npos;
00445   if (quotesStart != std::string::npos) {
00446     quotesEnd = line->find("\"", quotesStart + 1);
00447     while (quotesEnd != std::string::npos && line->at(quotesEnd - 1) == '\\') {
00448       // Do not erase slash yet - we will erase it in parseLine(..) while loop
00449       quotesEnd = line->find("\"", quotesEnd + 2);
00450     }
00451   }
00452   if ((foundAt = line->find(base::consts::kConfigurationComment)) != std::string::npos) {
00453     if (foundAt < quotesEnd) {
00454       foundAt = line->find(base::consts::kConfigurationComment, quotesEnd + 1);
00455     }
00456     *line = line->substr(0, foundAt);
00457   }
00458 }
00459
00460 bool Configurations::Parser::isLevel(const std::string& line) {
00461   return base::utils::Str::startsWith(line, std::string(base::consts::kConfigurationLevel));
00462 }
00463
00464 bool Configurations::Parser::isComment(const std::string& line) {
00465   return base::utils::Str::startsWith(line, std::string(base::consts::kConfigurationComment));
00466 }
00467
00468 bool Configurations::Parser::isConfig(const std::string& line) {
00469   std::size_t assignment = line.find('=');
00470   return line != "" &&
00471          ((line[0] >= 'A' && line[0] <= 'Z') || (line[0] >= 'a' && line[0] <= 'z')) &&
00472          (assignment != std::string::npos) &&
00473          (line.size() > assignment);
00474 }
00475
00476 bool Configurations::Parser::parseLine(std::string* line, std::string* currConfigStr, std::string*
      currLevelStr,
00477                                        Level* currLevel,
00478                                        Configurations* conf) {
00479   ConfigurationType currConfig = ConfigurationType::Unknown;
00480   std::string currValue = std::string();
00481   *line = base::utils::Str::trim(*line);
00482   if (isComment(*line)) return true;
00483   ignoreComments(line);
00484   *line = base::utils::Str::trim(*line);
00485   if (line->empty()) {
00486     // Comment ignored
00487     return true;
00488   }
00489   if (isLevel(*line)) {
00490     if (line->size() <= 2) {
00491       return true;
00492     }
00493     *currLevelStr = line->substr(1, line->size() - 2);
00494     *currLevelStr = base::utils::Str::toUpper(*currLevelStr);
00495     *currLevelStr = base::utils::Str::trim(*currLevelStr);
00496     *currLevel = LevelHelper::convertFromString(currLevelStr->c_str());
00497     return true;
00498   }
00499   if (isConfig(*line)) {
00500     std::size_t assignment = line->find('=');
00501     *currConfigStr = line->substr(0, assignment);
00502     *currConfigStr = base::utils::Str::toUpper(*currConfigStr);
00503     *currConfigStr = base::utils::Str::trim(*currConfigStr);
00504     currConfig = ConfigurationTypeHelper::convertFromString(currConfigStr->c_str());
00505     currValue = line->substr(assignment + 1);
00506     currValue = base::utils::Str::trim(currValue);
00507     std::size_t quotesStart = currValue.find("\"", 0);
00508     std::size_t quotesEnd = std::string::npos;
00509     if (quotesStart != std::string::npos) {
00510       quotesEnd = currValue.find("\"", quotesStart + 1);
00511       while (quotesEnd != std::string::npos && currValue.at(quotesEnd - 1) == '\\') {
00512         currValue = currValue.erase(quotesEnd - 1, 1);
00513         quotesEnd = currValue.find("\"", quotesEnd + 2);
00514       }
00515     }
00516     if (quotesStart != std::string::npos && quotesEnd != std::string::npos) {
00517       // Quote provided - check and strip if valid
00518       ELPP_ASSERT((quotesStart < quotesEnd), "Configuration error - No ending quote found in ["
```

```
00519                   « currConfigStr « "]");
00520       ELPP_ASSERT((quotesStart + 1 != quotesEnd), "Empty configuration value for [" « currConfigStr « "]");
00521       if ((quotesStart != quotesEnd) && (quotesStart + 1 != quotesEnd)) {
00522         // Explicit check in case if assertion is disabled
00523         currValue = currValue.substr(quotesStart + 1, quotesEnd - 1);
00524       }
00525     }
00526   }
00527   ELPP_ASSERT(*currLevel != Level::Unknown, "Unrecognized severity level [" « *currLevelStr « "]");
00528   ELPP_ASSERT(currConfig != ConfigurationType::Unknown, "Unrecognized configuration [" « *currConfigStr « "]");
00529   if (*currLevel == Level::Unknown || currConfig == ConfigurationType::Unknown) {
00530     return false;  // unrecognizable level or config
00531   }
00532   conf->set(*currLevel, currConfig, currValue);
00533   return true;
00534 }
00535
00536 void Configurations::unsafeSetIfNotExist(Level level, ConfigurationType configurationType, const std::string& value) {
00537   Configuration* conf = RegistryWithPred<Configuration, Configuration::Predicate>::get(level, configurationType);
00538   if (conf == nullptr) {
00539     unsafeSet(level, configurationType, value);
00540   }
00541 }
00542
00543 void Configurations::unsafeSet(Level level, ConfigurationType configurationType, const std::string& value) {
00544   Configuration* conf = RegistryWithPred<Configuration, Configuration::Predicate>::get(level, configurationType);
00545   if (conf == nullptr) {
00546     registerNew(new Configuration(level, configurationType, value));
00547   } else {
00548     conf->setValue(value);
00549   }
00550   if (level == Level::Global) {
00551     unsafeSetGlobally(configurationType, value, false);
00552   }
00553 }
00554
00555 void Configurations::setGlobally(ConfigurationType configurationType, const std::string& value,
00556                                  bool includeGlobalLevel) {
00557   if (includeGlobalLevel) {
00558     set(Level::Global, configurationType, value);
00559   }
00560   base::type::EnumType lIndex = LevelHelper::kMinValid;
00561   LevelHelper::forEachLevel(&lIndex, [&](void) -> bool {
00562     set(LevelHelper::castFromInt(lIndex), configurationType, value);
00563     return false;  // Do not break lambda function yet as we need to set all levels regardless
00564   });
00565 }
00566
00567 void Configurations::unsafeSetGlobally(ConfigurationType configurationType, const std::string& value,
00568                                        bool includeGlobalLevel) {
00569   if (includeGlobalLevel) {
00570     unsafeSet(Level::Global, configurationType, value);
00571   }
00572   base::type::EnumType lIndex = LevelHelper::kMinValid;
00573   LevelHelper::forEachLevel(&lIndex, [&](void) -> bool  {
00574     unsafeSet(LevelHelper::castFromInt(lIndex), configurationType, value);
00575     return false;  // Do not break lambda function yet as we need to set all levels regardless
00576   });
00577 }
00578
00579 // LogBuilder
00580
00581 void LogBuilder::convertToColoredOutput(base::type::string_t* logLine, Level level) {
00582   if (!m_termSupportsColor) return;
00583   const base::type::char_t* resetColor = ELPP_LITERAL("\x1b[0m");
00584   if (level == Level::Error || level == Level::Fatal)
00585     *logLine = ELPP_LITERAL("\x1b[31m") + *logLine + resetColor;
00586   else if (level == Level::Warning)
00587     *logLine = ELPP_LITERAL("\x1b[33m") + *logLine + resetColor;
00588   else if (level == Level::Debug)
00589     *logLine = ELPP_LITERAL("\x1b[32m") + *logLine + resetColor;
00590   else if (level == Level::Info)
00591     *logLine = ELPP_LITERAL("\x1b[36m") + *logLine + resetColor;
00592   else if (level == Level::Trace)
00593     *logLine = ELPP_LITERAL("\x1b[35m") + *logLine + resetColor;
00594 }
00595
00596 // Logger
00597
00598 Logger::Logger(const std::string& id, base::LogStreamsReferenceMapPtr logStreamsReference) :
00599   m_id(id),
```

```
00600   m_typedConfigurations(nullptr),
00601   m_parentApplicationName(std::string()),
00602   m_isConfigured(false),
00603   m_logStreamsReference(logStreamsReference) {
00604   initUnflushedCount();
00605 }
00606
00607 Logger::Logger(const std::string& id, const Configurations& configurations,
00608                base::LogStreamsReferenceMapPtr logStreamsReference) :
00609   m_id(id),
00610   m_typedConfigurations(nullptr),
00611   m_parentApplicationName(std::string()),
00612   m_isConfigured(false),
00613   m_logStreamsReference(logStreamsReference) {
00614   initUnflushedCount();
00615   configure(configurations);
00616 }
00617
00618 Logger::Logger(const Logger& logger) {
00619   base::utils::safeDelete(m_typedConfigurations);
00620   m_id = logger.m_id;
00621   m_typedConfigurations = logger.m_typedConfigurations;
00622   m_parentApplicationName = logger.m_parentApplicationName;
00623   m_isConfigured = logger.m_isConfigured;
00624   m_configurations = logger.m_configurations;
00625   m_unflushedCount = logger.m_unflushedCount;
00626   m_logStreamsReference = logger.m_logStreamsReference;
00627 }
00628
00629 Logger& Logger::operator=(const Logger& logger) {
00630   if (&logger != this) {
00631     base::utils::safeDelete(m_typedConfigurations);
00632     m_id = logger.m_id;
00633     m_typedConfigurations = logger.m_typedConfigurations;
00634     m_parentApplicationName = logger.m_parentApplicationName;
00635     m_isConfigured = logger.m_isConfigured;
00636     m_configurations = logger.m_configurations;
00637     m_unflushedCount = logger.m_unflushedCount;
00638     m_logStreamsReference = logger.m_logStreamsReference;
00639   }
00640   return *this;
00641 }
00642
00643 void Logger::configure(const Configurations& configurations) {
00644   m_isConfigured = false;  // we set it to false in case if we fail
00645   initUnflushedCount();
00646   if (m_typedConfigurations != nullptr) {
00647     Configurations* c = const_cast<Configurations*>(m_typedConfigurations->configurations());
00648     if (c->hasConfiguration(Level::Global, ConfigurationType::Filename)) {
00649       flush();
00650     }
00651   }
00652   base::threading::ScopedLock scopedLock(lock());
00653   if (m_configurations != configurations) {
00654     m_configurations.setFromBase(const_cast<Configurations*>(&configurations));
00655   }
00656   base::utils::safeDelete(m_typedConfigurations);
00657   m_typedConfigurations = new base::TypedConfigurations(&m_configurations, m_logStreamsReference);
00658   resolveLoggerFormatSpec();
00659   m_isConfigured = true;
00660 }
00661
00662 void Logger::reconfigure(void) {
00663   ELPP_INTERNAL_INFO(1, "Reconfiguring logger [" << m_id << "]");
00664   configure(m_configurations);
00665 }
00666
00667 bool Logger::isValidId(const std::string& id) {
00668   for (std::string::const_iterator it = id.begin(); it != id.end(); ++it) {
00669     if (!base::utils::Str::contains(base::consts::kValidLoggerIdSymbols, *it)) {
00670       return false;
00671     }
00672   }
00673   return true;
00674 }
00675
00676 void Logger::flush(void) {
00677   ELPP_INTERNAL_INFO(3, "Flushing logger [" << m_id << "] all levels");
00678   base::threading::ScopedLock scopedLock(lock());
00679   base::type::EnumType lIndex = LevelHelper::kMinValid;
00680   LevelHelper::forEachLevel(&lIndex, [&](void) -> bool {
00681     flush(LevelHelper::castFromInt(lIndex), nullptr);
00682     return false;
00683   });
00684 }
00685
00686 void Logger::flush(Level level, base::type::fstream_t* fs) {
```

```
00687   if (fs == nullptr && m_typedConfigurations->toFile(level)) {
00688     fs = m_typedConfigurations->fileStream(level);
00689   }
00690   if (fs != nullptr) {
00691     fs->flush();
00692     std::unordered_map<Level, unsigned int>::iterator iter = m_unflushedCount.find(level);
00693     if (iter != m_unflushedCount.end()) {
00694       iter->second = 0;
00695     }
00696     Helpers::validateFileRolling(this, level);
00697   }
00698 }
00699
00700 void Logger::initUnflushedCount(void) {
00701   m_unflushedCount.clear();
00702   base::type::EnumType lIndex = LevelHelper::kMinValid;
00703   LevelHelper::forEachLevel(&lIndex, [&](void) -> bool {
00704     m_unflushedCount.insert(std::make_pair(LevelHelper::castFromInt(lIndex), 0));
00705     return false;
00706   });
00707 }
00708
00709 void Logger::resolveLoggerFormatSpec(void) const {
00710   base::type::EnumType lIndex = LevelHelper::kMinValid;
00711   LevelHelper::forEachLevel(&lIndex, [&](void) -> bool {
00712     base::LogFormat* logFormat =
00713     const_cast<base::LogFormat*>(&m_typedConfigurations->logFormat(LevelHelper::castFromInt(lIndex)));
00714     base::utils::Str::replaceFirstWithEscape(logFormat->m_format,
      base::consts::kLoggerIdFormatSpecifier, m_id);
00715     return false;
00716   });
00717 }
00718
00719 // el::base
00720 namespace base {
00721
00722 // el::base::utils
00723 namespace utils {
00724
00725 // File
00726
00727 base::type::fstream_t* File::newFileStream(const std::string& filename) {
00728   base::type::fstream_t *fs = new base::type::fstream_t(filename.c_str(),
00729       base::type::fstream_t::out
00730 #if !defined(ELPP_FRESH_LOG_FILE)
00731       | base::type::fstream_t::app
00732 #endif
00733                                                         );
00734 #if defined(ELPP_UNICODE)
00735   std::locale elppUnicodeLocale("");
00736 #  if ELPP_OS_WINDOWS
00737   std::locale elppUnicodeLocaleWindows(elppUnicodeLocale, new std::codecvt_utf8_utf16<wchar_t>);
00738   elppUnicodeLocale = elppUnicodeLocaleWindows;
00739 #  endif // ELPP_OS_WINDOWS
00740   fs->imbue(elppUnicodeLocale);
00741 #endif  // defined(ELPP_UNICODE)
00742   if (fs->is_open()) {
00743     fs->flush();
00744   } else {
00745     base::utils::safeDelete(fs);
00746     ELPP_INTERNAL_ERROR("Bad file [" << filename << "]", true);
00747   }
00748   return fs;
00749 }
00750
00751 std::size_t File::getSizeOfFile(base::type::fstream_t* fs) {
00752   if (fs == nullptr) {
00753     return 0;
00754   }
00755   // Since the file stream is appended to or truncated, the current
00756   // offset is the file size.
00757   std::size_t size = static_cast<std::size_t>(fs->tellg());
00758   return size;
00759 }
00760
00761 bool File::pathExists(const char* path, bool considerFile) {
00762   if (path == nullptr) {
00763     return false;
00764   }
00765 #if ELPP_OS_UNIX
00766   ELPP_UNUSED(considerFile);
00767   struct stat st;
00768   return (stat(path, &st) == 0);
00769 #elif ELPP_OS_WINDOWS
00770   DWORD fileType = GetFileAttributesA(path);
00771   if (fileType == INVALID_FILE_ATTRIBUTES) {
00772     return false;
```

```
00773   }
00774   return considerFile ? true : ((fileType & FILE_ATTRIBUTE_DIRECTORY) == 0 ? false : true);
00775 #endif  // ELPP_OS_UNIX
00776 }
00777
00778 bool File::createPath(const std::string& path) {
00779   if (path.empty()) {
00780     return false;
00781   }
00782   if (base::utils::File::pathExists(path.c_str())) {
00783     return true;
00784   }
00785   int status = -1;
00786
00787   char* currPath = const_cast<char*>(path.c_str());
00788   std::string builtPath = std::string();
00789 #if ELPP_OS_UNIX
00790   if (path[0] == '/') {
00791     builtPath = "/";
00792   }
00793   currPath = STRTOK(currPath, base::consts::kFilePathSeparator, 0);
00794 #elif ELPP_OS_WINDOWS
00795   // Use secure functions API
00796   char* nextTok_ = nullptr;
00797   currPath = STRTOK(currPath, base::consts::kFilePathSeparator, &nextTok_);
00798   ELPP_UNUSED(nextTok_);
00799 #endif  // ELPP_OS_UNIX
00800   while (currPath != nullptr) {
00801     builtPath.append(currPath);
00802     builtPath.append(base::consts::kFilePathSeparator);
00803 #if ELPP_OS_UNIX
00804     status = mkdir(builtPath.c_str(), ELPP_LOG_PERMS);
00805     currPath = STRTOK(nullptr, base::consts::kFilePathSeparator, 0);
00806 #elif ELPP_OS_WINDOWS
00807     status = _mkdir(builtPath.c_str());
00808     currPath = STRTOK(nullptr, base::consts::kFilePathSeparator, &nextTok_);
00809 #endif  // ELPP_OS_UNIX
00810   }
00811   if (status == -1) {
00812     ELPP_INTERNAL_ERROR("Error while creating path [" << path << "]", true);
00813     return false;
00814   }
00815   return true;
00816 }
00817
00818 std::string File::extractPathFromFilename(const std::string& fullPath, const char* separator) {
00819   if ((fullPath == "") || (fullPath.find(separator) == std::string::npos)) {
00820     return fullPath;
00821   }
00822   std::size_t lastSlashAt = fullPath.find_last_of(separator);
00823   if (lastSlashAt == 0) {
00824     return std::string(separator);
00825   }
00826   return fullPath.substr(0, lastSlashAt + 1);
00827 }
00828
00829 void File::buildStrippedFilename(const char* filename, char buff[], std::size_t limit) {
00830   std::size_t sizeOfFilename = strlen(filename);
00831   if (sizeOfFilename >= limit) {
00832     filename += (sizeOfFilename - limit);
00833     if (filename[0] != '.' && filename[1] != '.') {  // prepend if not already
00834       filename += 3;  // 3 = '..'
00835       STRCAT(buff, "..", limit);
00836     }
00837   }
00838   STRCAT(buff, filename, limit);
00839 }
00840
00841 void File::buildBaseFilename(const std::string& fullPath, char buff[], std::size_t limit, const char*
      separator) {
00842   const char *filename = fullPath.c_str();
00843   std::size_t lastSlashAt = fullPath.find_last_of(separator);
00844   filename += lastSlashAt ? lastSlashAt+1 : 0;
00845   std::size_t sizeOfFilename = strlen(filename);
00846   if (sizeOfFilename >= limit) {
00847     filename += (sizeOfFilename - limit);
00848     if (filename[0] != '.' && filename[1] != '.') {  // prepend if not already
00849       filename += 3;  // 3 = '..'
00850       STRCAT(buff, "..", limit);
00851     }
00852   }
00853   STRCAT(buff, filename, limit);
00854 }
00855
00856 // Str
00857
00858 bool Str::wildCardMatch(const char* str, const char* pattern) {
```

```
00859   while (*pattern) {
00860     switch (*pattern) {
00861     case '?':
00862       if (!*str)
00863         return false;
00864       ++str;
00865       ++pattern;
00866       break;
00867     case '*':
00868       if (wildCardMatch(str, pattern + 1))
00869         return true;
00870       if (*str && wildCardMatch(str + 1, pattern))
00871         return true;
00872       return false;
00873     default:
00874       if (*str++ != *pattern++)
00875         return false;
00876       break;
00877     }
00878   }
00879   return !*str && !*pattern;
00880 }
00881
00882 std::string& Str::ltrim(std::string& str) {
00883   str.erase(str.begin(), std::find_if(str.begin(), str.end(), [](char c) {
00884     return !std::isspace(c);
00885   } ));
00886   return str;
00887 }
00888
00889 std::string& Str::rtrim(std::string& str) {
00890   str.erase(std::find_if(str.rbegin(), str.rend(), [](char c) {
00891     return !std::isspace(c);
00892   }).base(), str.end());
00893   return str;
00894 }
00895
00896 std::string& Str::trim(std::string& str) {
00897   return ltrim(rtrim(str));
00898 }
00899
00900 bool Str::startsWith(const std::string& str, const std::string& start) {
00901   return (str.length() >= start.length()) && (str.compare(0, start.length(), start) == 0);
00902 }
00903
00904 bool Str::endsWith(const std::string& str, const std::string& end) {
00905   return (str.length() >= end.length()) && (str.compare(str.length() - end.length(), end.length(),
      end) == 0);
00906 }
00907
00908 std::string& Str::replaceAll(std::string& str, char replaceWhat, char replaceWith) {
00909   std::replace(str.begin(), str.end(), replaceWhat, replaceWith);
00910   return str;
00911 }
00912
00913 std::string& Str::replaceAll(std::string& str, const std::string& replaceWhat,
00914                              const std::string& replaceWith) {
00915   if (replaceWhat == replaceWith)
00916     return str;
00917   std::size_t foundAt = std::string::npos;
00918   while ((foundAt = str.find(replaceWhat, foundAt + 1)) != std::string::npos) {
00919     str.replace(foundAt, replaceWhat.length(), replaceWith);
00920   }
00921   return str;
00922 }
00923
00924 void Str::replaceFirstWithEscape(base::type::string_t& str, const base::type::string_t& replaceWhat,
00925                                  const base::type::string_t& replaceWith) {
00926   std::size_t foundAt = base::type::string_t::npos;
00927   while ((foundAt = str.find(replaceWhat, foundAt + 1)) != base::type::string_t::npos) {
00928     if (foundAt > 0 && str[foundAt - 1] == base::consts::kFormatSpecifierChar) {
00929       str.erase(foundAt - 1, 1);
00930       ++foundAt;
00931     } else {
00932       str.replace(foundAt, replaceWhat.length(), replaceWith);
00933       return;
00934     }
00935   }
00936 }
00937 #if defined(ELPP_UNICODE)
00938 void Str::replaceFirstWithEscape(base::type::string_t& str, const base::type::string_t& replaceWhat,
00939                                  const std::string& replaceWith) {
00940   replaceFirstWithEscape(str, replaceWhat, base::type::string_t(replaceWith.begin(),
      replaceWith.end()));
00941 }
00942 #endif  // defined(ELPP_UNICODE)
00943
```

```
00944 std::string& Str::toUpper(std::string& str) {
00945   std::transform(str.begin(), str.end(), str.begin(),
00946   [](char c) {
00947     return static_cast<char>(::toupper(c));
00948   });
00949   return str;
00950 }
00951
00952 bool Str::cStringEq(const char* s1, const char* s2) {
00953   if (s1 == nullptr && s2 == nullptr) return true;
00954   if (s1 == nullptr || s2 == nullptr) return false;
00955   return strcmp(s1, s2) == 0;
00956 }
00957
00958 bool Str::cStringCaseEq(const char* s1, const char* s2) {
00959   if (s1 == nullptr && s2 == nullptr) return true;
00960   if (s1 == nullptr || s2 == nullptr) return false;
00961
00962   // With thanks to cygwin for this code
00963   int d = 0;
00964
00965   while (true) {
00966     const int c1 = toupper(*s1++);
00967     const int c2 = toupper(*s2++);
00968
00969     if (((d = c1 - c2) != 0) || (c2 == '\0')) {
00970       break;
00971     }
00972   }
00973
00974   return d == 0;
00975 }
00976
00977 bool Str::contains(const char* str, char c) {
00978   for (; *str; ++str) {
00979     if (*str == c)
00980       return true;
00981   }
00982   return false;
00983 }
00984
00985 char* Str::convertAndAddToBuff(std::size_t n, int len, char* buf, const char* bufLim, bool zeroPadded)
    {
00986   char localBuff[10] = "";
00987   char* p = localBuff + sizeof(localBuff) - 2;
00988   if (n > 0) {
00989     for (; n > 0 && p > localBuff && len > 0; n /= 10, --len)
00990       *--p = static_cast<char>(n % 10 + '0');
00991   } else {
00992     *--p = '0';
00993     --len;
00994   }
00995   if (zeroPadded)
00996     while (p > localBuff && len-- > 0) *--p = static_cast<char>('0');
00997   return addToBuff(p, buf, bufLim);
00998 }
00999
01000 char* Str::addToBuff(const char* str, char* buf, const char* bufLim) {
01001   while ((buf < bufLim) && ((*buf = *str++) != '\0'))
01002     ++buf;
01003   return buf;
01004 }
01005
01006 char* Str::clearBuff(char buff[], std::size_t lim) {
01007   STRCPY(buff, "", lim);
01008   ELPP_UNUSED(lim);  // For *nix we dont have anything using lim in above STRCPY macro
01009   return buff;
01010 }
01011
01014 char* Str::wcharPtrToCharPtr(const wchar_t* line) {
01015   std::size_t len_ = wcslen(line) + 1;
01016   char* buff_ = static_cast<char*>(malloc(len_ + 1));
01017 #      if ELPP_OS_UNIX || (ELPP_OS_WINDOWS && !ELPP_CRT_DBG_WARNINGS)
01018   std::wcstombs(buff_, line, len_);
01019 #      elif ELPP_OS_WINDOWS
01020   std::size_t convCount_ = 0;
01021   mbstate_t mbState_;
01022   ::memset(static_cast<void*>(&mbState_), 0, sizeof(mbState_));
01023   wcsrtombs_s(&convCount_, buff_, len_, &line, len_, &mbState_);
01024 #      endif  // ELPP_OS_UNIX || (ELPP_OS_WINDOWS && !ELPP_CRT_DBG_WARNINGS)
01025   return buff_;
01026 }
01027
01028 // OS
01029
01030 #if ELPP_OS_WINDOWS
01035 const char* OS::getWindowsEnvironmentVariable(const char* varname) {
```

```
01036   const DWORD bufferLen = 50;
01037   static char buffer[bufferLen];
01038   if (GetEnvironmentVariableA(varname, buffer, bufferLen)) {
01039     return buffer;
01040   }
01041   return nullptr;
01042 }
01043 #endif  // ELPP_OS_WINDOWS
01044 #if ELPP_OS_ANDROID
01045 std::string OS::getProperty(const char* prop) {
01046   char propVal[PROP_VALUE_MAX + 1];
01047   int ret = __system_property_get(prop, propVal);
01048   return ret == 0 ? std::string() : std::string(propVal);
01049 }
01050
01051 std::string OS::getDeviceName(void) {
01052   std::stringstream ss;
01053   std::string manufacturer = getProperty("ro.product.manufacturer");
01054   std::string model = getProperty("ro.product.model");
01055   if (manufacturer.empty() || model.empty()) {
01056     return std::string();
01057   }
01058   ss « manufacturer « "-" « model;
01059   return ss.str();
01060 }
01061 #endif  // ELPP_OS_ANDROID
01062
01063 const std::string OS::getBashOutput(const char* command) {
01064 #if (ELPP_OS_UNIX && !ELPP_OS_ANDROID && !ELPP_CYGWIN)
01065   if (command == nullptr) {
01066     return std::string();
01067   }
01068   FILE* proc = nullptr;
01069   if ((proc = popen(command, "r")) == nullptr) {
01070     ELPP_INTERNAL_ERROR("\nUnable to run command [" « command « "]", true);
01071     return std::string();
01072   }
01073   char hBuff[4096];
01074   if (fgets(hBuff, sizeof(hBuff), proc) != nullptr) {
01075     pclose(proc);
01076     const std::size_t buffLen = strlen(hBuff);
01077     if (buffLen > 0 && hBuff[buffLen - 1] == '\n') {
01078       hBuff[buffLen - 1] = '\0';
01079     }
01080     return std::string(hBuff);
01081   } else {
01082     pclose(proc);
01083   }
01084   return std::string();
01085 #else
01086   ELPP_UNUSED(command);
01087   return std::string();
01088 #endif  // (ELPP_OS_UNIX && !ELPP_OS_ANDROID && !ELPP_CYGWIN)
01089 }
01090
01091 std::string OS::getEnvironmentVariable(const char* variableName, const char* defaultVal,
01092                                        const char* alternativeBashCommand) {
01093 #if ELPP_OS_UNIX
01094   const char* val = getenv(variableName);
01095 #elif ELPP_OS_WINDOWS
01096   const char* val = getWindowsEnvironmentVariable(variableName);
01097 #endif  // ELPP_OS_UNIX
01098   if ((val == nullptr) || ((strcmp(val, "") == 0))) {
01099 #if ELPP_OS_UNIX && defined(ELPP_FORCE_ENV_VAR_FROM_BASH)
01100     // Try harder on unix-based systems
01101     std::string valBash = base::utils::OS::getBashOutput(alternativeBashCommand);
01102     if (valBash.empty()) {
01103       return std::string(defaultVal);
01104     } else {
01105       return valBash;
01106     }
01107 #elif ELPP_OS_WINDOWS || ELPP_OS_UNIX
01108     ELPP_UNUSED(alternativeBashCommand);
01109     return std::string(defaultVal);
01110 #endif  // ELPP_OS_UNIX && defined(ELPP_FORCE_ENV_VAR_FROM_BASH)
01111   }
01112   return std::string(val);
01113 }
01114
01115 std::string OS::currentUser(void) {
01116 #if ELPP_OS_UNIX && !ELPP_OS_ANDROID
01117   return getEnvironmentVariable("USER", base::consts::kUnknownUser, "whoami");
01118 #elif ELPP_OS_WINDOWS
01119   return getEnvironmentVariable("USERNAME", base::consts::kUnknownUser);
01120 #elif ELPP_OS_ANDROID
01121   ELPP_UNUSED(base::consts::kUnknownUser);
01122   return std::string("android");
```

```
01123 #else
01124   return std::string();
01125 #endif  // ELPP_OS_UNIX && !ELPP_OS_ANDROID
01126 }
01127
01128 std::string OS::currentHost(void) {
01129 #if ELPP_OS_UNIX && !ELPP_OS_ANDROID
01130   return getEnvironmentVariable("HOSTNAME", base::consts::kUnknownHost, "hostname");
01131 #elif ELPP_OS_WINDOWS
01132   return getEnvironmentVariable("COMPUTERNAME", base::consts::kUnknownHost);
01133 #elif ELPP_OS_ANDROID
01134   ELPP_UNUSED(base::consts::kUnknownHost);
01135   return getDeviceName();
01136 #else
01137   return std::string();
01138 #endif  // ELPP_OS_UNIX && !ELPP_OS_ANDROID
01139 }
01140
01141 bool OS::termSupportsColor(void) {
01142   std::string term = getEnvironmentVariable("TERM", "");
01143   return term == "xterm" || term == "xterm-color" || term == "xterm-256color"
01144          || term == "screen" || term == "linux" || term == "cygwin"
01145          || term == "screen-256color";
01146 }
01147
01148 // DateTime
01149
01150 void DateTime::gettimeofday(struct timeval* tv) {
01151 #if ELPP_OS_WINDOWS
01152   if (tv != nullptr) {
01153 #  if ELPP_COMPILER_MSVC || defined(_MSC_EXTENSIONS)
01154     const unsigned __int64 delta_ = 11644473600000000Ui64;
01155 #  else
01156     const unsigned __int64 delta_ = 11644473600000000ULL;
01157 #  endif  // ELPP_COMPILER_MSVC || defined(_MSC_EXTENSIONS)
01158     const double secOffSet = 0.000001;
01159     const unsigned long usecOffSet = 1000000;
01160     FILETIME fileTime;
01161     GetSystemTimeAsFileTime(&fileTime);
01162     unsigned __int64 present = 0;
01163     present |= fileTime.dwHighDateTime;
01164     present = present « 32;
01165     present |= fileTime.dwLowDateTime;
01166     present /= 10;  // mic-sec
01167     // Subtract the difference
01168     present -= delta_;
01169     tv->tv_sec = static_cast<long>(present * secOffSet);
01170     tv->tv_usec = static_cast<long>(present % usecOffSet);
01171   }
01172 #else
01173   ::gettimeofday(tv, nullptr);
01174 #endif  // ELPP_OS_WINDOWS
01175 }
01176
01177 std::string DateTime::getDateTime(const char* format, const base::SubsecondPrecision* ssPrec) {
01178   struct timeval currTime;
01179   gettimeofday(&currTime);
01180   return timevalToString(currTime, format, ssPrec);
01181 }
01182
01183 std::string DateTime::timevalToString(struct timeval tval, const char* format,
01184                                       const el::base::SubsecondPrecision* ssPrec) {
01185   struct ::tm timeInfo;
01186   buildTimeInfo(&tval, &timeInfo);
01187   const int kBuffSize = 30;
01188   char buff_[kBuffSize] = "";
01189   parseFormat(buff_, kBuffSize, format, &timeInfo, static_cast<std::size_t>(tval.tv_usec /
      ssPrec->m_offset),
01190               ssPrec);
01191   return std::string(buff_);
01192 }
01193
01194 base::type::string_t DateTime::formatTime(unsigned long long time, base::TimestampUnit timestampUnit)
    {
01195   base::type::EnumType start = static_cast<base::type::EnumType>(timestampUnit);
01196   const base::type::char_t* unit = base::consts::kTimeFormats[start].unit;
01197   for (base::type::EnumType i = start; i < base::consts::kTimeFormatsCount - 1; ++i) {
01198     if (time <= base::consts::kTimeFormats[i].value) {
01199       break;
01200     }
01201     if (base::consts::kTimeFormats[i].value == 1000.0f && time / 1000.0f < 1.9f) {
01202       break;
01203     }
01204     time /= static_cast<decltype(time)>(base::consts::kTimeFormats[i].value);
01205     unit = base::consts::kTimeFormats[i + 1].unit;
01206   }
01207   base::type::stringstream_t ss;
```

```
01208   ss « time « " " « unit;
01209   return ss.str();
01210 }
01211
01212 unsigned long long DateTime::getTimeDifference(const struct timeval& endTime, const struct timeval&
      startTime,
01213     base::TimestampUnit timestampUnit) {
01214   if (timestampUnit == base::TimestampUnit::Microsecond) {
01215     return static_cast<unsigned long long>(static_cast<unsigned long long>(1000000 * endTime.tv_sec +
      endTime.tv_usec) -
01216                                            static_cast<unsigned long long>(1000000 * startTime.tv_sec
      + startTime.tv_usec));
01217   }
01218   // milliseconds
01219   auto conv = [](const struct timeval& tim) {
01220     return static_cast<unsigned long long>((tim.tv_sec * 1000) + (tim.tv_usec / 1000));
01221   };
01222   return static_cast<unsigned long long>(conv(endTime) - conv(startTime));
01223 }
01224
01225 struct ::tm* DateTime::buildTimeInfo(struct timeval* currTime, struct ::tm* timeInfo) {
01226 #if ELPP_OS_UNIX
01227   time_t rawTime = currTime->tv_sec;
01228   ::elpptime_r(&rawTime, timeInfo);
01229   return timeInfo;
01230 #else
01231 #  if ELPP_COMPILER_MSVC
01232   ELPP_UNUSED(currTime);
01233   time_t t;
01234 #    if defined(_USE_32BIT_TIME_T)
01235   _time32(&t);
01236 #    else
01237   _time64(&t);
01238 #    endif
01239   elpptime_s(timeInfo, &t);
01240   return timeInfo;
01241 #  else
01242   // For any other compilers that don't have CRT warnings issue e.g, MinGW or TDM GCC- we use
      different method
01243   time_t rawTime = currTime->tv_sec;
01244   struct tm* tmInf = elpptime(&rawTime);
01245   *timeInfo = *tmInf;
01246   return timeInfo;
01247 #  endif  // ELPP_COMPILER_MSVC
01248 #endif  // ELPP_OS_UNIX
01249 }
01250
01251 char* DateTime::parseFormat(char* buf, std::size_t bufSz, const char* format, const struct tm* tInfo,
01252                             std::size_t msec, const base::SubsecondPrecision* ssPrec) {
01253   const char* bufLim = buf + bufSz;
01254   for (; *format; ++format) {
01255     if (*format == base::consts::kFormatSpecifierChar) {
01256       switch (*++format) {
01257       case base::consts::kFormatSpecifierChar:  // Escape
01258         break;
01259       case '\0':  // End
01260         --format;
01261         break;
01262       case 'd':  // Day
01263         buf = base::utils::Str::convertAndAddToBuff(tInfo->tm_mday, 2, buf, bufLim);
01264         continue;
01265       case 'a':  // Day of week (short)
01266         buf = base::utils::Str::addToBuff(base::consts::kDaysAbbrev[tInfo->tm_wday], buf, bufLim);
01267         continue;
01268       case 'A':  // Day of week (long)
01269         buf = base::utils::Str::addToBuff(base::consts::kDays[tInfo->tm_wday], buf, bufLim);
01270         continue;
01271       case 'M':  // month
01272         buf = base::utils::Str::convertAndAddToBuff(tInfo->tm_mon + 1, 2, buf, bufLim);
01273         continue;
01274       case 'b':  // month (short)
01275         buf = base::utils::Str::addToBuff(base::consts::kMonthsAbbrev[tInfo->tm_mon], buf, bufLim);
01276         continue;
01277       case 'B':  // month (long)
01278         buf = base::utils::Str::addToBuff(base::consts::kMonths[tInfo->tm_mon], buf, bufLim);
01279         continue;
01280       case 'y':  // year (two digits)
01281         buf = base::utils::Str::convertAndAddToBuff(tInfo->tm_year + base::consts::kYearBase, 2, buf,
      bufLim);
01282         continue;
01283       case 'Y':  // year (four digits)
01284         buf = base::utils::Str::convertAndAddToBuff(tInfo->tm_year + base::consts::kYearBase, 4, buf,
      bufLim);
01285         continue;
01286       case 'h':  // hour (12-hour)
01287         buf = base::utils::Str::convertAndAddToBuff(tInfo->tm_hour % 12, 2, buf, bufLim);
01288         continue;
```

```
01289       case 'H':  // hour (24-hour)
01290         buf = base::utils::Str::convertAndAddToBuff(tInfo->tm_hour, 2, buf, bufLim);
01291         continue;
01292       case 'm':  // minute
01293         buf = base::utils::Str::convertAndAddToBuff(tInfo->tm_min, 2, buf, bufLim);
01294         continue;
01295       case 's':  // second
01296         buf = base::utils::Str::convertAndAddToBuff(tInfo->tm_sec, 2, buf, bufLim);
01297         continue;
01298       case 'z':  // subsecond part
01299       case 'g':
01300         buf = base::utils::Str::convertAndAddToBuff(msec, ssPrec->m_width, buf, bufLim);
01301         continue;
01302       case 'F':  // AM/PM
01303         buf = base::utils::Str::addToBuff((tInfo->tm_hour >= 12) ? base::consts::kPm :
      base::consts::kAm, buf, bufLim);
01304         continue;
01305       default:
01306         continue;
01307       }
01308     }
01309     if (buf == bufLim) break;
01310     *buf++ = *format;
01311   }
01312   return buf;
01313 }
01314
01315 // CommandLineArgs
01316
01317 void CommandLineArgs::setArgs(int argc, char** argv) {
01318   m_params.clear();
01319   m_paramsWithValue.clear();
01320   if (argc == 0 || argv == nullptr) {
01321     return;
01322   }
01323   m_argc = argc;
01324   m_argv = argv;
01325   for (int i = 1; i < m_argc; ++i) {
01326     const char* v = (strstr(m_argv[i], "="));
01327     if (v != nullptr && strlen(v) > 0) {
01328       std::string key = std::string(m_argv[i]);
01329       key = key.substr(0, key.find_first_of('='));
01330       if (hasParamWithValue(key.c_str())) {
01331         ELPP_INTERNAL_INFO(1, "Skipping [" << key << "] arg since it already has value ["
01332                               << getParamValue(key.c_str()) << "]");
01333       } else {
01334         m_paramsWithValue.insert(std::make_pair(key, std::string(v + 1)));
01335       }
01336     }
01337     if (v == nullptr) {
01338       if (hasParam(m_argv[i])) {
01339         ELPP_INTERNAL_INFO(1, "Skipping [" << m_argv[i] << "] arg since it already exists");
01340       } else {
01341         m_params.push_back(std::string(m_argv[i]));
01342       }
01343     }
01344   }
01345 }
01346
01347 bool CommandLineArgs::hasParamWithValue(const char* paramKey) const {
01348   return m_paramsWithValue.find(std::string(paramKey)) != m_paramsWithValue.end();
01349 }
01350
01351 const char* CommandLineArgs::getParamValue(const char* paramKey) const {
01352   std::unordered_map<std::string, std::string>::const_iterator iter =
      m_paramsWithValue.find(std::string(paramKey));
01353   return iter != m_paramsWithValue.end() ? iter->second.c_str() : "";
01354 }
01355
01356 bool CommandLineArgs::hasParam(const char* paramKey) const {
01357   return std::find(m_params.begin(), m_params.end(), std::string(paramKey)) != m_params.end();
01358 }
01359
01360 bool CommandLineArgs::empty(void) const {
01361   return m_params.empty() && m_paramsWithValue.empty();
01362 }
01363
01364 std::size_t CommandLineArgs::size(void) const {
01365   return m_params.size() + m_paramsWithValue.size();
01366 }
01367
01368 base::type::ostream_t& operator<<(base::type::ostream_t& os, const CommandLineArgs& c) {
01369   for (int i = 1; i < c.m_argc; ++i) {
01370     os << ELPP_LITERAL("[") << c.m_argv[i] << ELPP_LITERAL("]");
01371     if (i < c.m_argc - 1) {
01372       os << ELPP_LITERAL(" ");
01373     }
```

```
01374   }
01375   return os;
01376 }
01377
01378 } // namespace utils
01379
01380 // el::base::threading
01381 namespace threading {
01382
01383 #if ELPP_THREADING_ENABLED
01384 #  if ELPP_USE_STD_THREADING
01385 #      if ELPP_ASYNC_LOGGING
01386 static void msleep(int ms) {
01387   // Only when async logging enabled - this is because async is strict on compiler
01388 #         if defined(ELPP_NO_SLEEP_FOR)
01389   usleep(ms * 1000);
01390 #         else
01391   std::this_thread::sleep_for(std::chrono::milliseconds(ms));
01392 #         endif  // defined(ELPP_NO_SLEEP_FOR)
01393 }
01394 #      endif  // ELPP_ASYNC_LOGGING
01395 #  endif  // !ELPP_USE_STD_THREADING
01396 #endif  // ELPP_THREADING_ENABLED
01397
01398 } // namespace threading
01399
01400 // el::base
01401
01402 // SubsecondPrecision
01403
01404 void SubsecondPrecision::init(int width) {
01405   if (width < 1 || width > 6) {
01406     width = base::consts::kDefaultSubsecondPrecision;
01407   }
01408   m_width = width;
01409   switch (m_width) {
01410   case 3:
01411     m_offset = 1000;
01412     break;
01413   case 4:
01414     m_offset = 100;
01415     break;
01416   case 5:
01417     m_offset = 10;
01418     break;
01419   case 6:
01420     m_offset = 1;
01421     break;
01422   default:
01423     m_offset = 1000;
01424     break;
01425   }
01426 }
01427
01428 // LogFormat
01429
01430 LogFormat::LogFormat(void) :
01431   m_level(Level::Unknown),
01432   m_userFormat(base::type::string_t()),
01433   m_format(base::type::string_t()),
01434   m_dateTimeFormat(std::string()),
01435   m_flags(0x0),
01436   m_currentUser(base::utils::OS::currentUser()),
01437   m_currentHost(base::utils::OS::currentHost()) {
01438 }
01439
01440 LogFormat::LogFormat(Level level, const base::type::string_t& format)
01441   : m_level(level), m_userFormat(format), m_currentUser(base::utils::OS::currentUser()),
01442     m_currentHost(base::utils::OS::currentHost()) {
01443   parseFromFormat(m_userFormat);
01444 }
01445
01446 LogFormat::LogFormat(const LogFormat& logFormat):
01447   m_level(logFormat.m_level),
01448   m_userFormat(logFormat.m_userFormat),
01449   m_format(logFormat.m_format),
01450   m_dateTimeFormat(logFormat.m_dateTimeFormat),
01451   m_flags(logFormat.m_flags),
01452   m_currentUser(logFormat.m_currentUser),
01453   m_currentHost(logFormat.m_currentHost) {
01454 }
01455
01456 LogFormat::LogFormat(LogFormat&& logFormat) {
01457   m_level = std::move(logFormat.m_level);
01458   m_userFormat = std::move(logFormat.m_userFormat);
01459   m_format = std::move(logFormat.m_format);
01460   m_dateTimeFormat = std::move(logFormat.m_dateTimeFormat);
```

```
01461   m_flags = std::move(logFormat.m_flags);
01462   m_currentUser = std::move(logFormat.m_currentUser);
01463   m_currentHost = std::move(logFormat.m_currentHost);
01464 }
01465
01466 LogFormat& LogFormat::operator=(const LogFormat& logFormat) {
01467   if (&logFormat != this) {
01468     m_level = logFormat.m_level;
01469     m_userFormat = logFormat.m_userFormat;
01470     m_dateTimeFormat = logFormat.m_dateTimeFormat;
01471     m_flags = logFormat.m_flags;
01472     m_currentUser = logFormat.m_currentUser;
01473     m_currentHost = logFormat.m_currentHost;
01474   }
01475   return *this;
01476 }
01477
01478 bool LogFormat::operator==(const LogFormat& other) {
01479   return m_level == other.m_level && m_userFormat == other.m_userFormat && m_format == other.m_format
      &&
01480          m_dateTimeFormat == other.m_dateTimeFormat && m_flags == other.m_flags;
01481 }
01482
01485 void LogFormat::parseFromFormat(const base::type::string_t& userFormat) {
01486   // We make copy because we will be changing the format
01487   // i.e, removing user provided date format from original format
01488   // and then storing it.
01489   base::type::string_t formatCopy = userFormat;
01490   m_flags = 0x0;
01491   auto conditionalAddFlag = [&](const base::type::char_t* specifier, base::FormatFlags flag) {
01492     std::size_t foundAt = base::type::string_t::npos;
01493     while ((foundAt = formatCopy.find(specifier, foundAt + 1)) != base::type::string_t::npos) {
01494       if (foundAt > 0 && formatCopy[foundAt - 1] == base::consts::kFormatSpecifierChar) {
01495         if (hasFlag(flag)) {
01496           // If we already have flag we remove the escape chars so that '%%' is turned to '%'
01497           // even after specifier resolution - this is because we only replaceFirst specifier
01498           formatCopy.erase(foundAt - 1, 1);
01499           ++foundAt;
01500         }
01501       } else {
01502         if (!hasFlag(flag)) addFlag(flag);
01503       }
01504     }
01505   };
01506   conditionalAddFlag(base::consts::kAppNameFormatSpecifier, base::FormatFlags::AppName);
01507   conditionalAddFlag(base::consts::kSeverityLevelFormatSpecifier, base::FormatFlags::Level);
01508   conditionalAddFlag(base::consts::kSeverityLevelShortFormatSpecifier, base::FormatFlags::LevelShort);
01509   conditionalAddFlag(base::consts::kLoggerIdFormatSpecifier, base::FormatFlags::LoggerId);
01510   conditionalAddFlag(base::consts::kThreadIdFormatSpecifier, base::FormatFlags::ThreadId);
01511   conditionalAddFlag(base::consts::kLogFileFormatSpecifier, base::FormatFlags::File);
01512   conditionalAddFlag(base::consts::kLogFileBaseFormatSpecifier, base::FormatFlags::FileBase);
01513   conditionalAddFlag(base::consts::kLogLineFormatSpecifier, base::FormatFlags::Line);
01514   conditionalAddFlag(base::consts::kLogLocationFormatSpecifier, base::FormatFlags::Location);
01515   conditionalAddFlag(base::consts::kLogFunctionFormatSpecifier, base::FormatFlags::Function);
01516   conditionalAddFlag(base::consts::kCurrentUserFormatSpecifier, base::FormatFlags::User);
01517   conditionalAddFlag(base::consts::kCurrentHostFormatSpecifier, base::FormatFlags::Host);
01518   conditionalAddFlag(base::consts::kMessageFormatSpecifier, base::FormatFlags::LogMessage);
01519   conditionalAddFlag(base::consts::kVerboseLevelFormatSpecifier, base::FormatFlags::VerboseLevel);
01520   // For date/time we need to extract user's date format first
01521   std::size_t dateIndex = std::string::npos;
01522   if ((dateIndex = formatCopy.find(base::consts::kDateTimeFormatSpecifier)) != std::string::npos) {
01523     while (dateIndex != std::string::npos && dateIndex > 0 && formatCopy[dateIndex - 1] ==
      base::consts::kFormatSpecifierChar) {
01524       dateIndex = formatCopy.find(base::consts::kDateTimeFormatSpecifier, dateIndex + 1);
01525     }
01526     if (dateIndex != std::string::npos) {
01527       addFlag(base::FormatFlags::DateTime);
01528       updateDateFormat(dateIndex, formatCopy);
01529     }
01530   }
01531   m_format = formatCopy;
01532   updateFormatSpec();
01533 }
01534
01535 void LogFormat::updateDateFormat(std::size_t index, base::type::string_t& currFormat) {
01536   if (hasFlag(base::FormatFlags::DateTime)) {
01537     index += ELPP_STRLEN(base::consts::kDateTimeFormatSpecifier);
01538   }
01539   const base::type::char_t* ptr = currFormat.c_str() + index;
01540   if ((currFormat.size() > index) && (ptr[0] == '{')) {
01541     // User has provided format for date/time
01542     ++ptr;
01543     int count = 1;  // Start by 1 in order to remove starting brace
01544     std::stringstream ss;
01545     for (; *ptr; ++ptr, ++count) {
01546       if (*ptr == '}') {
01547         ++count;  // In order to remove ending brace
```

```
01548         break;
01549       }
01550       ss << static_cast<char>(*ptr);
01551     }
01552     currFormat.erase(index, count);
01553     m_dateTimeFormat = ss.str();
01554   } else {
01555     // No format provided, use default
01556     if (hasFlag(base::FormatFlags::DateTime)) {
01557       m_dateTimeFormat = std::string(base::consts::kDefaultDateTimeFormat);
01558     }
01559   }
01560 }
01561
01562 void LogFormat::updateFormatSpec(void) {
01563   // Do not use switch over strongly typed enums because Intel C++ compilers dont support them yet.
01564   if (m_level == Level::Debug) {
01565     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kSeverityLevelFormatSpecifier,
01566         base::consts::kDebugLevelLogValue);
01567     base::utils::Str::replaceFirstWithEscape(m_format,
      base::consts::kSeverityLevelShortFormatSpecifier,
01568         base::consts::kDebugLevelShortLogValue);
01569   } else if (m_level == Level::Info) {
01570     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kSeverityLevelFormatSpecifier,
01571         base::consts::kInfoLevelLogValue);
01572     base::utils::Str::replaceFirstWithEscape(m_format,
      base::consts::kSeverityLevelShortFormatSpecifier,
01573         base::consts::kInfoLevelShortLogValue);
01574   } else if (m_level == Level::Warning) {
01575     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kSeverityLevelFormatSpecifier,
01576         base::consts::kWarningLevelLogValue);
01577     base::utils::Str::replaceFirstWithEscape(m_format,
      base::consts::kSeverityLevelShortFormatSpecifier,
01578         base::consts::kWarningLevelShortLogValue);
01579   } else if (m_level == Level::Error) {
01580     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kSeverityLevelFormatSpecifier,
01581         base::consts::kErrorLevelLogValue);
01582     base::utils::Str::replaceFirstWithEscape(m_format,
      base::consts::kSeverityLevelShortFormatSpecifier,
01583         base::consts::kErrorLevelShortLogValue);
01584   } else if (m_level == Level::Fatal) {
01585     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kSeverityLevelFormatSpecifier,
01586         base::consts::kFatalLevelLogValue);
01587     base::utils::Str::replaceFirstWithEscape(m_format,
      base::consts::kSeverityLevelShortFormatSpecifier,
01588         base::consts::kFatalLevelShortLogValue);
01589   } else if (m_level == Level::Verbose) {
01590     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kSeverityLevelFormatSpecifier,
01591         base::consts::kVerboseLevelLogValue);
01592     base::utils::Str::replaceFirstWithEscape(m_format,
      base::consts::kSeverityLevelShortFormatSpecifier,
01593         base::consts::kVerboseLevelShortLogValue);
01594   } else if (m_level == Level::Trace) {
01595     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kSeverityLevelFormatSpecifier,
01596         base::consts::kTraceLevelLogValue);
01597     base::utils::Str::replaceFirstWithEscape(m_format,
      base::consts::kSeverityLevelShortFormatSpecifier,
01598         base::consts::kTraceLevelShortLogValue);
01599   }
01600   if (hasFlag(base::FormatFlags::User)) {
01601     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kCurrentUserFormatSpecifier,
01602         m_currentUser);
01603   }
01604   if (hasFlag(base::FormatFlags::Host)) {
01605     base::utils::Str::replaceFirstWithEscape(m_format, base::consts::kCurrentHostFormatSpecifier,
01606         m_currentHost);
01607   }
01608   // Ignore Level::Global and Level::Unknown
01609 }
01610
01611 // TypedConfigurations
01612
01613 TypedConfigurations::TypedConfigurations(Configurations* configurations,
01614     LogStreamsReferenceMapPtr logStreamsReference) {
01615   m_configurations = configurations;
01616   m_logStreamsReference = logStreamsReference;
01617   build(m_configurations);
01618 }
01619
01620 TypedConfigurations::TypedConfigurations(const TypedConfigurations& other) {
01621   this->m_configurations = other.m_configurations;
01622   this->m_logStreamsReference = other.m_logStreamsReference;
01623   build(m_configurations);
01624 }
01625
01626 bool TypedConfigurations::enabled(Level level) {
01627   return getConfigByVal<bool>(level, &m_enabledMap, "enabled");
```

```
01628 }
01629
01630 bool TypedConfigurations::toFile(Level level) {
01631   return getConfigByVal<bool>(level, &m_toFileMap, "toFile");
01632 }
01633
01634 const std::string& TypedConfigurations::filename(Level level) {
01635   return getConfigByRef<std::string>(level, &m_filenameMap, "filename");
01636 }
01637
01638 bool TypedConfigurations::toStandardOutput(Level level) {
01639   return getConfigByVal<bool>(level, &m_toStandardOutputMap, "toStandardOutput");
01640 }
01641
01642 const base::LogFormat& TypedConfigurations::logFormat(Level level) {
01643   return getConfigByRef<base::LogFormat>(level, &m_logFormatMap, "logFormat");
01644 }
01645
01646 const base::SubsecondPrecision& TypedConfigurations::subsecondPrecision(Level level) {
01647   return getConfigByRef<base::SubsecondPrecision>(level, &m_subsecondPrecisionMap,
      "subsecondPrecision");
01648 }
01649
01650 const base::MillisecondsWidth& TypedConfigurations::millisecondsWidth(Level level) {
01651   return getConfigByRef<base::MillisecondsWidth>(level, &m_subsecondPrecisionMap,
      "millisecondsWidth");
01652 }
01653
01654 bool TypedConfigurations::performanceTracking(Level level) {
01655   return getConfigByVal<bool>(level, &m_performanceTrackingMap, "performanceTracking");
01656 }
01657
01658 base::type::fstream_t* TypedConfigurations::fileStream(Level level) {
01659   return getConfigByRef<base::FileStreamPtr>(level, &m_fileStreamMap, "fileStream").get();
01660 }
01661
01662 std::size_t TypedConfigurations::maxLogFileSize(Level level) {
01663   return getConfigByVal<std::size_t>(level, &m_maxLogFileSizeMap, "maxLogFileSize");
01664 }
01665
01666 std::size_t TypedConfigurations::logFlushThreshold(Level level) {
01667   return getConfigByVal<std::size_t>(level, &m_logFlushThresholdMap, "logFlushThreshold");
01668 }
01669
01670 void TypedConfigurations::build(Configurations* configurations) {
01671   base::threading::ScopedLock scopedLock(lock());
01672   auto getBool = [] (std::string boolStr) -> bool {  // Pass by value for trimming
01673     base::utils::Str::trim(boolStr);
01674     return (boolStr == "TRUE" || boolStr == "true" || boolStr == "1");
01675   };
01676   std::vector<Configuration*> withFileSizeLimit;
01677   for (Configurations::const_iterator it = configurations->begin(); it != configurations->end(); ++it)
      {
01678     Configuration* conf = *it;
01679     // We cannot use switch on strong enums because Intel C++ dont support them yet
01680     if (conf->configurationType() == ConfigurationType::Enabled) {
01681       setValue(conf->level(), getBool(conf->value()), &m_enabledMap);
01682     } else if (conf->configurationType() == ConfigurationType::ToFile) {
01683       setValue(conf->level(), getBool(conf->value()), &m_toFileMap);
01684     } else if (conf->configurationType() == ConfigurationType::ToStandardOutput) {
01685       setValue(conf->level(), getBool(conf->value()), &m_toStandardOutputMap);
01686     } else if (conf->configurationType() == ConfigurationType::Filename) {
01687       // We do not yet configure filename but we will configure in another
01688       // loop. This is because if file cannot be created, we will force ToFile
01689       // to be false. Because configuring logger is not necessarily performance
01690       // sensitive operation, we can live with another loop; (by the way this loop
01691       // is not very heavy either)
01692     } else if (conf->configurationType() == ConfigurationType::Format) {
01693       setValue(conf->level(), base::LogFormat(conf->level(),
01694                                               base::type::string_t(conf->value().begin(),
      conf->value().end())), &m_logFormatMap);
01695     } else if (conf->configurationType() == ConfigurationType::SubsecondPrecision) {
01696       setValue(Level::Global,
01697                base::SubsecondPrecision(static_cast<int>(getULong(conf->value()))),
      &m_subsecondPrecisionMap);
01698     } else if (conf->configurationType() == ConfigurationType::PerformanceTracking) {
01699       setValue(Level::Global, getBool(conf->value()), &m_performanceTrackingMap);
01700     } else if (conf->configurationType() == ConfigurationType::MaxLogFileSize) {
01701       auto v = getULong(conf->value());
01702       setValue(conf->level(), static_cast<std::size_t>(v), &m_maxLogFileSizeMap);
01703       if (v != 0) {
01704         withFileSizeLimit.push_back(conf);
01705       }
01706     } else if (conf->configurationType() == ConfigurationType::LogFlushThreshold) {
01707       setValue(conf->level(), static_cast<std::size_t>(getULong(conf->value())),
      &m_logFlushThresholdMap);
01708     }
```

```
01709   }
01710   // As mentioned earlier, we will now set filename configuration in separate loop to deal with
    non-existent files
01711   for (Configurations::const_iterator it = configurations->begin(); it != configurations->end(); ++it)
    {
01712     Configuration* conf = *it;
01713     if (conf->configurationType() == ConfigurationType::Filename) {
01714       insertFile(conf->level(), conf->value());
01715     }
01716   }
01717   for (std::vector<Configuration*>::iterator conf = withFileSizeLimit.begin();
01718        conf != withFileSizeLimit.end(); ++conf) {
01719     // This is not unsafe as mutex is locked in currect scope
01720     unsafeValidateFileRolling((*conf)->level(), base::defaultPreRollOutCallback);
01721   }
01722 }
01723
01724 unsigned long TypedConfigurations::getULong(std::string confVal) {
01725   bool valid = true;
01726   base::utils::Str::trim(confVal);
01727   valid = !confVal.empty() && std::find_if(confVal.begin(), confVal.end(),
01728   [](char c) {
01729     return !base::utils::Str::isDigit(c);
01730   }) == confVal.end();
01731   if (!valid) {
01732     valid = false;
01733     ELPP_ASSERT(valid, "Configuration value not a valid integer [" << confVal << "]");
01734     return 0;
01735   }
01736   return atol(confVal.c_str());
01737 }
01738
01739 std::string TypedConfigurations::resolveFilename(const std::string& filename) {
01740   std::string resultingFilename = filename;
01741   std::size_t dateIndex = std::string::npos;
01742   std::string dateTimeFormatSpecifierStr =
    std::string(base::consts::kDateTimeFormatSpecifierForFilename);
01743   if ((dateIndex = resultingFilename.find(dateTimeFormatSpecifierStr.c_str())) != std::string::npos) {
01744     while (dateIndex > 0 && resultingFilename[dateIndex - 1] == base::consts::kFormatSpecifierChar) {
01745       dateIndex = resultingFilename.find(dateTimeFormatSpecifierStr.c_str(), dateIndex + 1);
01746     }
01747     if (dateIndex != std::string::npos) {
01748       const char* ptr = resultingFilename.c_str() + dateIndex;
01749       // Goto end of specifier
01750       ptr += dateTimeFormatSpecifierStr.size();
01751       std::string fmt;
01752       if ((resultingFilename.size() > dateIndex) && (ptr[0] == '{')) {
01753         // User has provided format for date/time
01754         ++ptr;
01755         int count = 1;  // Start by 1 in order to remove starting brace
01756         std::stringstream ss;
01757         for (; *ptr; ++ptr, ++count) {
01758           if (*ptr == '}') {
01759             ++count;  // In order to remove ending brace
01760             break;
01761           }
01762           ss << *ptr;
01763         }
01764         resultingFilename.erase(dateIndex + dateTimeFormatSpecifierStr.size(), count);
01765         fmt = ss.str();
01766       } else {
01767         fmt = std::string(base::consts::kDefaultDateTimeFormatInFilename);
01768       }
01769       base::SubsecondPrecision ssPrec(3);
01770       std::string now = base::utils::DateTime::getDateTime(fmt.c_str(), &ssPrec);
01771       base::utils::Str::replaceAll(now, '/', '-'); // Replace path element since we are dealing with
    filename
01772       base::utils::Str::replaceAll(resultingFilename, dateTimeFormatSpecifierStr, now);
01773     }
01774   }
01775   return resultingFilename;
01776 }
01777
01778 void TypedConfigurations::insertFile(Level level, const std::string& fullFilename) {
01779   std::string resolvedFilename = resolveFilename(fullFilename);
01780   if (resolvedFilename.empty()) {
01781     std::cerr << "Could not load empty file for logging, please re-check your configurations for level
    ["
01782               << LevelHelper::convertToString(level) << "]";
01783   }
01784   std::string filePath = base::utils::File::extractPathFromFilename(resolvedFilename,
    base::consts::kFilePathSeparator);
01785   if (filePath.size() < resolvedFilename.size()) {
01786     base::utils::File::createPath(filePath);
01787   }
01788   auto create = [&](Level level) {
01789     base::LogStreamsReferenceMap::iterator filestreamIter =
```

```
      m_logStreamsReference->find(resolvedFilename);
01790     base::type::fstream_t* fs = nullptr;
01791     if (filestreamIter == m_logStreamsReference->end()) {
01792       // We need a completely new stream, nothing to share with
01793       fs = base::utils::File::newFileStream(resolvedFilename);
01794       m_filenameMap.insert(std::make_pair(level, resolvedFilename));
01795       m_fileStreamMap.insert(std::make_pair(level, base::FileStreamPtr(fs)));
01796       m_logStreamsReference->insert(std::make_pair(resolvedFilename,
      base::FileStreamPtr(m_fileStreamMap.at(level))));
01797     } else {
01798       // Woops! we have an existing one, share it!
01799       m_filenameMap.insert(std::make_pair(level, filestreamIter->first));
01800       m_fileStreamMap.insert(std::make_pair(level, base::FileStreamPtr(filestreamIter->second)));
01801       fs = filestreamIter->second.get();
01802     }
01803     if (fs == nullptr) {
01804       // We display bad file error from newFileStream()
01805       ELPP_INTERNAL_ERROR("Setting [TO_FILE] of ["
01806                           << LevelHelper::convertToString(level) << "] to FALSE", false);
01807       setValue(level, false, &m_toFileMap);
01808     }
01809   };
01810   // If we dont have file conf for any level, create it for Level::Global first
01811   // otherwise create for specified level
01812   create(m_filenameMap.empty() && m_fileStreamMap.empty() ? Level::Global : level);
01813 }
01814
01815 bool TypedConfigurations::unsafeValidateFileRolling(Level level, const PreRollOutCallback&
      preRollOutCallback) {
01816   base::type::fstream_t* fs = unsafeGetConfigByRef(level, &m_fileStreamMap, "fileStream").get();
01817   if (fs == nullptr) {
01818     return true;
01819   }
01820   std::size_t maxLogFileSize = unsafeGetConfigByVal(level, &m_maxLogFileSizeMap, "maxLogFileSize");
01821   std::size_t currFileSize = base::utils::File::getSizeOfFile(fs);
01822   if (maxLogFileSize != 0 && currFileSize >= maxLogFileSize) {
01823     std::string fname = unsafeGetConfigByRef(level, &m_filenameMap, "filename");
01824     ELPP_INTERNAL_INFO(1, "Truncating log file [" << fname << "] as a result of configurations for level
      ["
01825                        << LevelHelper::convertToString(level) << "]");
01826     fs->close();
01827     preRollOutCallback(fname.c_str(), currFileSize);
01828     fs->open(fname, std::fstream::out | std::fstream::trunc);
01829     return true;
01830   }
01831   return false;
01832 }
01833
01834 // RegisteredHitCounters
01835
01836 bool RegisteredHitCounters::validateEveryN(const char* filename, base::type::LineNumber lineNumber,
      std::size_t n) {
01837   base::threading::ScopedLock scopedLock(lock());
01838   base::HitCounter* counter = get(filename, lineNumber);
01839   if (counter == nullptr) {
01840     registerNew(counter = new base::HitCounter(filename, lineNumber));
01841   }
01842   counter->validateHitCounts(n);
01843   bool result = (n >= 1 && counter->hitCounts() != 0 && counter->hitCounts() % n == 0);
01844   return result;
01845 }
01846
01849 bool RegisteredHitCounters::validateAfterN(const char* filename, base::type::LineNumber lineNumber,
      std::size_t n) {
01850   base::threading::ScopedLock scopedLock(lock());
01851   base::HitCounter* counter = get(filename, lineNumber);
01852   if (counter == nullptr) {
01853     registerNew(counter = new base::HitCounter(filename, lineNumber));
01854   }
01855   // Do not use validateHitCounts here since we do not want to reset counter here
01856   // Note the >= instead of > because we are incrementing
01857   // after this check
01858   if (counter->hitCounts() >= n)
01859     return true;
01860   counter->increment();
01861   return false;
01862 }
01863
01866 bool RegisteredHitCounters::validateNTimes(const char* filename, base::type::LineNumber lineNumber,
      std::size_t n) {
01867   base::threading::ScopedLock scopedLock(lock());
01868   base::HitCounter* counter = get(filename, lineNumber);
01869   if (counter == nullptr) {
01870     registerNew(counter = new base::HitCounter(filename, lineNumber));
01871   }
01872   counter->increment();
01873   // Do not use validateHitCounts here since we do not want to reset counter here
```

```
01874   if (counter->hitCounts() <= n)
01875     return true;
01876   return false;
01877 }
01878
01879 // RegisteredLoggers
01880
01881 RegisteredLoggers::RegisteredLoggers(const LogBuilderPtr& defaultLogBuilder) :
01882   m_defaultLogBuilder(defaultLogBuilder) {
01883   m_defaultConfigurations.setToDefault();
01884   m_logStreamsReference = std::make_shared<base::LogStreamsReferenceMap>();
01885 }
01886
01887 Logger* RegisteredLoggers::get(const std::string& id, bool forceCreation) {
01888   base::threading::ScopedLock scopedLock(lock());
01889   Logger* logger_ = base::utils::Registry<Logger, std::string>::get(id);
01890   if (logger_ == nullptr && forceCreation) {
01891     bool validId = Logger::isValidId(id);
01892     if (!validId) {
01893       ELPP_ASSERT(validId, "Invalid logger ID [" << id << "]. Not registering this logger.");
01894       return nullptr;
01895     }
01896     logger_ = new Logger(id, m_defaultConfigurations, m_logStreamsReference);
01897     logger_->m_logBuilder = m_defaultLogBuilder;
01898     registerNew(id, logger_);
01899     LoggerRegistrationCallback* callback = nullptr;
01900     for (const std::pair<std::string, base::type::LoggerRegistrationCallbackPtr>& h
01901          : m_loggerRegistrationCallbacks) {
01902       callback = h.second.get();
01903       if (callback != nullptr && callback->enabled()) {
01904         callback->handle(logger_);
01905       }
01906     }
01907   }
01908   return logger_;
01909 }
01910
01911 bool RegisteredLoggers::remove(const std::string& id) {
01912   if (id == base::consts::kDefaultLoggerId) {
01913     return false;
01914   }
01915   // get has internal lock
01916   Logger* logger = base::utils::Registry<Logger, std::string>::get(id);
01917   if (logger != nullptr) {
01918     // unregister has internal lock
01919     unregister(logger);
01920   }
01921   return true;
01922 }
01923
01924 void RegisteredLoggers::unsafeFlushAll(void) {
01925   ELPP_INTERNAL_INFO(1, "Flushing all log files");
01926   for (base::LogStreamsReferenceMap::iterator it = m_logStreamsReference->begin();
01927        it != m_logStreamsReference->end(); ++it) {
01928     if (it->second.get() == nullptr) continue;
01929     it->second->flush();
01930   }
01931 }
01932
01933 // VRegistry
01934
01935 VRegistry::VRegistry(base::type::VerboseLevel level, base::type::EnumType* pFlags) : m_level(level),
      m_pFlags(pFlags) {
01936 }
01937
01939 void VRegistry::setLevel(base::type::VerboseLevel level) {
01940   base::threading::ScopedLock scopedLock(lock());
01941   if (level > 9)
01942     m_level = base::consts::kMaxVerboseLevel;
01943   else
01944     m_level = level;
01945 }
01946
01947 void VRegistry::setModules(const char* modules) {
01948   base::threading::ScopedLock scopedLock(lock());
01949   auto addSuffix = [](std::stringstream& ss, const char* sfx, const char* prev) {
01950     if (prev != nullptr && base::utils::Str::endsWith(ss.str(), std::string(prev))) {
01951       std::string chr(ss.str().substr(0, ss.str().size() - strlen(prev)));
01952       ss.str(std::string(""));
01953       ss << chr;
01954     }
01955     if (base::utils::Str::endsWith(ss.str(), std::string(sfx))) {
01956       std::string chr(ss.str().substr(0, ss.str().size() - strlen(sfx)));
01957       ss.str(std::string(""));
01958       ss << chr;
01959     }
01960     ss << sfx;
```

```
01961   };
01962   auto insert = [&](std::stringstream& ss, base::type::VerboseLevel level) {
01963     if (!base::utils::hasFlag(LoggingFlag::DisableVModulesExtensions, *m_pFlags)) {
01964       addSuffix(ss, ".h", nullptr);
01965       m_modules.insert(std::make_pair(ss.str(), level));
01966       addSuffix(ss, ".c", ".h");
01967       m_modules.insert(std::make_pair(ss.str(), level));
01968       addSuffix(ss, ".cpp", ".c");
01969       m_modules.insert(std::make_pair(ss.str(), level));
01970       addSuffix(ss, ".cc", ".cpp");
01971       m_modules.insert(std::make_pair(ss.str(), level));
01972       addSuffix(ss, ".cxx", ".cc");
01973       m_modules.insert(std::make_pair(ss.str(), level));
01974       addSuffix(ss, ".-inl.h", ".cxx");
01975       m_modules.insert(std::make_pair(ss.str(), level));
01976       addSuffix(ss, ".hxx", ".-inl.h");
01977       m_modules.insert(std::make_pair(ss.str(), level));
01978       addSuffix(ss, ".hpp", ".hxx");
01979       m_modules.insert(std::make_pair(ss.str(), level));
01980       addSuffix(ss, ".hh", ".hpp");
01981     }
01982     m_modules.insert(std::make_pair(ss.str(), level));
01983   };
01984   bool isMod = true;
01985   bool isLevel = false;
01986   std::stringstream ss;
01987   int level = -1;
01988   for (; *modules; ++modules) {
01989     switch (*modules) {
01990     case '=':
01991       isLevel = true;
01992       isMod = false;
01993       break;
01994     case ',':
01995       isLevel = false;
01996       isMod = true;
01997       if (!ss.str().empty() && level != -1) {
01998         insert(ss, static_cast<base::type::VerboseLevel>(level));
01999         ss.str(std::string(""));
02000         level = -1;
02001       }
02002       break;
02003     default:
02004       if (isMod) {
02005         ss << *modules;
02006       } else if (isLevel) {
02007         if (isdigit(*modules)) {
02008           level = static_cast<base::type::VerboseLevel>(*modules) - 48;
02009         }
02010       }
02011       break;
02012     }
02013   }
02014   if (!ss.str().empty() && level != -1) {
02015     insert(ss, static_cast<base::type::VerboseLevel>(level));
02016   }
02017 }
02018
02019 bool VRegistry::allowed(base::type::VerboseLevel vlevel, const char* file) {
02020   base::threading::ScopedLock scopedLock(lock());
02021   if (m_modules.empty() || file == nullptr) {
02022     return vlevel <= m_level;
02023   } else {
02024     char baseFilename[base::consts::kSourceFilenameMaxLength] = "";
02025     base::utils::File::buildBaseFilename(file, baseFilename);
02026     std::unordered_map<std::string, base::type::VerboseLevel>::iterator it = m_modules.begin();
02027     for (; it != m_modules.end(); ++it) {
02028       if (base::utils::Str::wildCardMatch(baseFilename, it->first.c_str())) {
02029         return vlevel <= it->second;
02030       }
02031     }
02032     if (base::utils::hasFlag(LoggingFlag::AllowVerboseIfModuleNotSpecified, *m_pFlags)) {
02033       return true;
02034     }
02035     return false;
02036   }
02037 }
02038
02039 void VRegistry::setFromArgs(const base::utils::CommandLineArgs* commandLineArgs) {
02040   if (commandLineArgs->hasParam("-v") || commandLineArgs->hasParam("--verbose") ||
02041       commandLineArgs->hasParam("-V") || commandLineArgs->hasParam("--VERBOSE")) {
02042     setLevel(base::consts::kMaxVerboseLevel);
02043   } else if (commandLineArgs->hasParamWithValue("--v")) {
02044     setLevel(static_cast<base::type::VerboseLevel>(atoi(commandLineArgs->getParamValue("--v"))));
02045   } else if (commandLineArgs->hasParamWithValue("--V")) {
02046     setLevel(static_cast<base::type::VerboseLevel>(atoi(commandLineArgs->getParamValue("--V"))));
02047   } else if ((commandLineArgs->hasParamWithValue("-vmodule")) && vModulesEnabled()) {
```

```
02048     setModules(commandLineArgs->getParamValue("-vmodule"));
02049   } else if (commandLineArgs->hasParamWithValue("-VMODULE") && vModulesEnabled()) {
02050     setModules(commandLineArgs->getParamValue("-VMODULE"));
02051   }
02052 }
02053
02054 #if !defined(ELPP_DEFAULT_LOGGING_FLAGS)
02055 #   define ELPP_DEFAULT_LOGGING_FLAGS 0x0
02056 #endif // !defined(ELPP_DEFAULT_LOGGING_FLAGS)
02057 // Storage
02058 #if ELPP_ASYNC_LOGGING
02059 Storage::Storage(const LogBuilderPtr& defaultLogBuilder, base::IWorker* asyncDispatchWorker) :
02060 #else
02061 Storage::Storage(const LogBuilderPtr& defaultLogBuilder) :
02062 #endif  // ELPP_ASYNC_LOGGING
02063   m_registeredHitCounters(new base::RegisteredHitCounters()),
02064   m_registeredLoggers(new base::RegisteredLoggers(defaultLogBuilder)),
02065   m_flags(ELPP_DEFAULT_LOGGING_FLAGS),
02066   m_vRegistry(new base::VRegistry(0, &m_flags)),
02067
02068 #if ELPP_ASYNC_LOGGING
02069   m_asyncLogQueue(new base::AsyncLogQueue()),
02070   m_asyncDispatchWorker(asyncDispatchWorker),
02071 #endif  // ELPP_ASYNC_LOGGING
02072
02073   m_preRollOutCallback(base::defaultPreRollOutCallback) {
02074   // Register default logger
02075   m_registeredLoggers->get(std::string(base::consts::kDefaultLoggerId));
02076   // We register default logger anyway (worse case it's not going to register) just in case
02077   m_registeredLoggers->get("default");
02078
02079 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
02080   // Register performance logger and reconfigure format
02081   Logger* performanceLogger =
      m_registeredLoggers->get(std::string(base::consts::kPerformanceLoggerId));
02082   m_registeredLoggers->get("performance");
02083   performanceLogger->configurations()->setGlobally(ConfigurationType::Format, std::string("%datetime
      %level %msg"));
02084   performanceLogger->reconfigure();
02085 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
02086
02087 #if defined(ELPP_SYSLOG)
02088   // Register syslog logger and reconfigure format
02089   Logger* sysLogLogger = m_registeredLoggers->get(std::string(base::consts::kSysLogLoggerId));
02090   sysLogLogger->configurations()->setGlobally(ConfigurationType::Format, std::string("%level: %msg"));
02091   sysLogLogger->reconfigure();
02092 #endif //  defined(ELPP_SYSLOG)
02093   addFlag(LoggingFlag::AllowVerboseIfModuleNotSpecified);
02094 #if ELPP_ASYNC_LOGGING
02095   installLogDispatchCallback<base::AsyncLogDispatchCallback>(std::string("AsyncLogDispatchCallback"));
02096 #else
02097
      installLogDispatchCallback<base::DefaultLogDispatchCallback>(std::string("DefaultLogDispatchCallback"));
02098 #endif  // ELPP_ASYNC_LOGGING
02099 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
02100   installPerformanceTrackingCallback<base::DefaultPerformanceTrackingCallback>
02101   (std::string("DefaultPerformanceTrackingCallback"));
02102 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
02103   ELPP_INTERNAL_INFO(1, "Easylogging++ has been initialized");
02104 #if ELPP_ASYNC_LOGGING
02105   m_asyncDispatchWorker->start();
02106 #endif  // ELPP_ASYNC_LOGGING
02107 }
02108
02109 Storage::~Storage(void) {
02110   ELPP_INTERNAL_INFO(4, "Destroying storage");
02111 #if ELPP_ASYNC_LOGGING
02112   ELPP_INTERNAL_INFO(5, "Replacing log dispatch callback to synchronous");
02113
      uninstallLogDispatchCallback<base::AsyncLogDispatchCallback>(std::string("AsyncLogDispatchCallback"));
02114
      installLogDispatchCallback<base::DefaultLogDispatchCallback>(std::string("DefaultLogDispatchCallback"));
02115   ELPP_INTERNAL_INFO(5, "Destroying asyncDispatchWorker");
02116   base::utils::safeDelete(m_asyncDispatchWorker);
02117   ELPP_INTERNAL_INFO(5, "Destroying asyncLogQueue");
02118   base::utils::safeDelete(m_asyncLogQueue);
02119 #endif  // ELPP_ASYNC_LOGGING
02120   ELPP_INTERNAL_INFO(5, "Destroying registeredHitCounters");
02121   base::utils::safeDelete(m_registeredHitCounters);
02122   ELPP_INTERNAL_INFO(5, "Destroying registeredLoggers");
02123   base::utils::safeDelete(m_registeredLoggers);
02124   ELPP_INTERNAL_INFO(5, "Destroying vRegistry");
02125   base::utils::safeDelete(m_vRegistry);
02126 }
02127
02128 bool Storage::hasCustomFormatSpecifier(const char* formatSpecifier) {
02129   base::threading::ScopedLock scopedLock(customFormatSpecifiersLock());
```

```
02130   return std::find(m_customFormatSpecifiers.begin(), m_customFormatSpecifiers.end(),
02131                    formatSpecifier) != m_customFormatSpecifiers.end();
02132 }
02133
02134 void Storage::installCustomFormatSpecifier(const CustomFormatSpecifier& customFormatSpecifier) {
02135   if (hasCustomFormatSpecifier(customFormatSpecifier.formatSpecifier())) {
02136     return;
02137   }
02138   base::threading::ScopedLock scopedLock(customFormatSpecifiersLock());
02139   m_customFormatSpecifiers.push_back(customFormatSpecifier);
02140 }
02141
02142 bool Storage::uninstallCustomFormatSpecifier(const char* formatSpecifier) {
02143   base::threading::ScopedLock scopedLock(customFormatSpecifiersLock());
02144   std::vector<CustomFormatSpecifier>::iterator it = std::find(m_customFormatSpecifiers.begin(),
02145       m_customFormatSpecifiers.end(), formatSpecifier);
02146   if (it != m_customFormatSpecifiers.end() && strcmp(formatSpecifier, it->formatSpecifier()) == 0) {
02147     m_customFormatSpecifiers.erase(it);
02148     return true;
02149   }
02150   return false;
02151 }
02152
02153 void Storage::setApplicationArguments(int argc, char** argv) {
02154   m_commandLineArgs.setArgs(argc, argv);
02155   m_vRegistry->setFromArgs(commandLineArgs());
02156   // default log file
02157 #if !defined(ELPP_DISABLE_LOG_FILE_FROM_ARG)
02158   if (m_commandLineArgs.hasParamWithValue(base::consts::kDefaultLogFileParam)) {
02159     Configurations c;
02160     c.setGlobally(ConfigurationType::Filename,
02161                   std::string(m_commandLineArgs.getParamValue(base::consts::kDefaultLogFileParam)));
02162     registeredLoggers()->setDefaultConfigurations(c);
02163     for (base::RegisteredLoggers::iterator it = registeredLoggers()->begin();
02164          it != registeredLoggers()->end(); ++it) {
02165       it->second->configure(c);
02166     }
02167   }
02168 #endif  // !defined(ELPP_DISABLE_LOG_FILE_FROM_ARG)
02169 #if defined(ELPP_LOGGING_FLAGS_FROM_ARG)
02170   if (m_commandLineArgs.hasParamWithValue(base::consts::kLoggingFlagsParam)) {
02171     int userInput = atoi(m_commandLineArgs.getParamValue(base::consts::kLoggingFlagsParam));
02172     if (ELPP_DEFAULT_LOGGING_FLAGS == 0x0) {
02173       m_flags = userInput;
02174     } else {
02175       base::utils::addFlag<base::type::EnumType>(userInput, &m_flags);
02176     }
02177   }
02178 #endif  // defined(ELPP_LOGGING_FLAGS_FROM_ARG)
02179 }
02180
02181 } // namespace base
02182
02183 // LogDispatchCallback
02184 #if defined(ELPP_THREAD_SAFE)
02185 void LogDispatchCallback::handle(const LogDispatchData* data) {
02186   base::threading::ScopedLock scopedLock(m_fileLocksMapLock);
02187   std::string filename =
      data->logMessage()->logger()->typedConfigurations()->filename(data->logMessage()->level());
02188   auto lock = m_fileLocks.find(filename);
02189   if (lock == m_fileLocks.end()) {
02190     m_fileLocks.emplace(std::make_pair(filename, std::unique_ptr<base::threading::Mutex>(new
      base::threading::Mutex)));
02191   }
02192 }
02193 #else
02194 void LogDispatchCallback::handle(const LogDispatchData* /*data*/) {}
02195 #endif
02196
02197 base::threading::Mutex& LogDispatchCallback::fileHandle(const LogDispatchData* data) {
02198   auto it =
      m_fileLocks.find(data->logMessage()->logger()->typedConfigurations()->filename(data->logMessage()->level()));
02199   return *(it->second.get());
02200 }
02201
02202 namespace base {
02203 // DefaultLogDispatchCallback
02204
02205 void DefaultLogDispatchCallback::handle(const LogDispatchData* data) {
02206 #if defined(ELPP_THREAD_SAFE)
02207   LogDispatchCallback::handle(data);
02208   base::threading::ScopedLock scopedLock(fileHandle(data));
02209 #endif
02210   m_data = data;
02211   dispatch(m_data->logMessage()->logger()->logBuilder()->build(m_data->logMessage(),
02212            m_data->dispatchAction() == base::DispatchAction::NormalLog));
02213 }
```

```
02214
02215 void DefaultLogDispatchCallback::dispatch(base::type::string_t&& logLine) {
02216   if (m_data->dispatchAction() == base::DispatchAction::NormalLog) {
02217     if (m_data->logMessage()->logger()->m_typedConfigurations->toFile(m_data->logMessage()->level()))
      {
02218       base::type::fstream_t* fs = m_data->logMessage()->logger()->m_typedConfigurations->fileStream(
02219                                     m_data->logMessage()->level());
02220       if (fs != nullptr) {
02221         fs->write(logLine.c_str(), logLine.size());
02222         if (fs->fail()) {
02223           ELPP_INTERNAL_ERROR("Unable to write log to file ["
02224                               «
      m_data->logMessage()->logger()->m_typedConfigurations->filename(m_data->logMessage()->level()) «
      "].\n"
02225                               « "Few possible reasons (could be something else):\n" « "      *
      Permission denied\n"
02226                               « "      * Disk full\n" « "      * Disk is not writable", true);
02227         } else {
02228           if (ELPP->hasFlag(LoggingFlag::ImmediateFlush)
02229               || (m_data->logMessage()->logger()->isFlushNeeded(m_data->logMessage()->level()))) {
02230             m_data->logMessage()->logger()->flush(m_data->logMessage()->level(), fs);
02231           }
02232         }
02233       } else {
02234         ELPP_INTERNAL_ERROR("Log file for [" «
      LevelHelper::convertToString(m_data->logMessage()->level()) « "] "
02235                             « "has not been configured but [TO_FILE] is configured to TRUE. [Logger
      ID: "
02236                             « m_data->logMessage()->logger()->id() « "]", false);
02237       }
02238     }
02239     if
      (m_data->logMessage()->logger()->m_typedConfigurations->toStandardOutput(m_data->logMessage()->level()))
      {
02240       if (ELPP->hasFlag(LoggingFlag::ColoredTerminalOutput))
02241         m_data->logMessage()->logger()->logBuilder()->convertToColoredOutput(&logLine,
      m_data->logMessage()->level());
02242       ELPP_COUT « ELPP_COUT_LINE(logLine);
02243     }
02244   }
02245 #if defined(ELPP_SYSLOG)
02246   else if (m_data->dispatchAction() == base::DispatchAction::SysLog) {
02247     // Determine syslog priority
02248     int sysLogPriority = 0;
02249     if (m_data->logMessage()->level() == Level::Fatal)
02250       sysLogPriority = LOG_EMERG;
02251     else if (m_data->logMessage()->level() == Level::Error)
02252       sysLogPriority = LOG_ERR;
02253     else if (m_data->logMessage()->level() == Level::Warning)
02254       sysLogPriority = LOG_WARNING;
02255     else if (m_data->logMessage()->level() == Level::Info)
02256       sysLogPriority = LOG_INFO;
02257     else if (m_data->logMessage()->level() == Level::Debug)
02258       sysLogPriority = LOG_DEBUG;
02259     else
02260       sysLogPriority = LOG_NOTICE;
02261 #  if defined(ELPP_UNICODE)
02262     char* line = base::utils::Str::wcharPtrToCharPtr(logLine.c_str());
02263     syslog(sysLogPriority, "%s", line);
02264     free(line);
02265 #  else
02266     syslog(sysLogPriority, "%s", logLine.c_str());
02267 #  endif
02268   }
02269 #endif  // defined(ELPP_SYSLOG)
02270 }
02271
02272 #if ELPP_ASYNC_LOGGING
02273
02274 // AsyncLogDispatchCallback
02275
02276 void AsyncLogDispatchCallback::handle(const LogDispatchData* data) {
02277   base::type::string_t logLine = data->logMessage()->logger()->logBuilder()->build(data->logMessage(),
02278                                  data->dispatchAction() == base::DispatchAction::NormalLog);
02279   if (data->dispatchAction() == base::DispatchAction::NormalLog
02280       &&
      data->logMessage()->logger()->typedConfigurations()->toStandardOutput(data->logMessage()->level())) {
02281     if (ELPP->hasFlag(LoggingFlag::ColoredTerminalOutput))
02282       data->logMessage()->logger()->logBuilder()->convertToColoredOutput(&logLine,
      data->logMessage()->level());
02283     ELPP_COUT « ELPP_COUT_LINE(logLine);
02284   }
02285   // Save resources and only queue if we want to write to file otherwise just ignore handler
02286   if (data->logMessage()->logger()->typedConfigurations()->toFile(data->logMessage()->level())) {
02287     ELPP->asyncLogQueue()->push(AsyncLogItem(*(data->logMessage()), *data, logLine));
02288   }
02289 }
```

```
02290
02291 // AsyncDispatchWorker
02292 AsyncDispatchWorker::AsyncDispatchWorker() {
02293   setContinueRunning(false);
02294 }
02295
02296 AsyncDispatchWorker::~AsyncDispatchWorker() {
02297   setContinueRunning(false);
02298   ELPP_INTERNAL_INFO(6, "Stopping dispatch worker - Cleaning log queue");
02299   clean();
02300   ELPP_INTERNAL_INFO(6, "Log queue cleaned");
02301 }
02302
02303 bool AsyncDispatchWorker::clean(void) {
02304   std::mutex m;
02305   std::unique_lock<std::mutex> lk(m);
02306   cv.wait(lk, [] { return !ELPP->asyncLogQueue()->empty(); });
02307   emptyQueue();
02308   lk.unlock();
02309   cv.notify_one();
02310   return ELPP->asyncLogQueue()->empty();
02311 }
02312
02313 void AsyncDispatchWorker::emptyQueue(void) {
02314   while (!ELPP->asyncLogQueue()->empty()) {
02315     AsyncLogItem data = ELPP->asyncLogQueue()->next();
02316     handle(&data);
02317     base::threading::msleep(100);
02318   }
02319 }
02320
02321 void AsyncDispatchWorker::start(void) {
02322   base::threading::msleep(5000); // 5s (why?)
02323   setContinueRunning(true);
02324   std::thread t1(&AsyncDispatchWorker::run, this);
02325   t1.join();
02326 }
02327
02328 void AsyncDispatchWorker::handle(AsyncLogItem* logItem) {
02329   LogDispatchData* data = logItem->data();
02330   LogMessage* logMessage = logItem->logMessage();
02331   Logger* logger = logMessage->logger();
02332   base::TypedConfigurations* conf = logger->typedConfigurations();
02333   base::type::string_t logLine = logItem->logLine();
02334   if (data->dispatchAction() == base::DispatchAction::NormalLog) {
02335     if (conf->toFile(logMessage->level())) {
02336       base::type::fstream_t* fs = conf->fileStream(logMessage->level());
02337       if (fs != nullptr) {
02338         fs->write(logLine.c_str(), logLine.size());
02339         if (fs->fail()) {
02340           ELPP_INTERNAL_ERROR("Unable to write log to file ["
02341                               << conf->filename(logMessage->level()) << "].\n"
02342                               << "Few possible reasons (could be something else):\n" << "      *
      Permission denied\n"
02343                               << "      * Disk full\n" << "      * Disk is not writable", true);
02344         } else {
02345           if (ELPP->hasFlag(LoggingFlag::ImmediateFlush) ||
      (logger->isFlushNeeded(logMessage->level()))) {
02346             logger->flush(logMessage->level(), fs);
02347           }
02348         }
02349       } else {
02350         ELPP_INTERNAL_ERROR("Log file for [" << LevelHelper::convertToString(logMessage->level()) << "]
      "
02351                             << "has not been configured but [TO_FILE] is configured to TRUE. [Logger
      ID: " << logger->id() << "]", false);
02352       }
02353     }
02354   }
02355 #  if defined(ELPP_SYSLOG)
02356   else if (data->dispatchAction() == base::DispatchAction::SysLog) {
02357     // Determine syslog priority
02358     int sysLogPriority = 0;
02359     if (logMessage->level() == Level::Fatal)
02360       sysLogPriority = LOG_EMERG;
02361     else if (logMessage->level() == Level::Error)
02362       sysLogPriority = LOG_ERR;
02363     else if (logMessage->level() == Level::Warning)
02364       sysLogPriority = LOG_WARNING;
02365     else if (logMessage->level() == Level::Info)
02366       sysLogPriority = LOG_INFO;
02367     else if (logMessage->level() == Level::Debug)
02368       sysLogPriority = LOG_DEBUG;
02369     else
02370       sysLogPriority = LOG_NOTICE;
02371 #      if defined(ELPP_UNICODE)
02372     char* line = base::utils::Str::wcharPtrToCharPtr(logLine.c_str());
```

```
02373     syslog(sysLogPriority, "%s", line);
02374     free(line);
02375 #      else
02376     syslog(sysLogPriority, "%s", logLine.c_str());
02377 #      endif
02378   }
02379 #  endif  // defined(ELPP_SYSLOG)
02380 }
02381
02382 void AsyncDispatchWorker::run(void) {
02383   while (continueRunning()) {
02384     emptyQueue();
02385     base::threading::msleep(10); // 10ms
02386   }
02387 }
02388 #endif  // ELPP_ASYNC_LOGGING
02389
02390 // DefaultLogBuilder
02391
02392 base::type::string_t DefaultLogBuilder::build(const LogMessage* logMessage, bool appendNewLine) const
      {
02393   base::TypedConfigurations* tc = logMessage->logger()->typedConfigurations();
02394   const base::LogFormat* logFormat = &tc->logFormat(logMessage->level());
02395   base::type::string_t logLine = logFormat->format();
02396   char buff[base::consts::kSourceFilenameMaxLength + base::consts::kSourceLineMaxLength] = "";
02397   const char* bufLim = buff + sizeof(buff);
02398   if (logFormat->hasFlag(base::FormatFlags::AppName)) {
02399     // App name
02400     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kAppNameFormatSpecifier,
02401         logMessage->logger()->parentApplicationName());
02402   }
02403   if (logFormat->hasFlag(base::FormatFlags::ThreadId)) {
02404     // Thread ID
02405     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kThreadIdFormatSpecifier,
02406         ELPP->getThreadName(base::threading::getCurrentThreadId()));
02407   }
02408   if (logFormat->hasFlag(base::FormatFlags::DateTime)) {
02409     // DateTime
02410     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kDateTimeFormatSpecifier,
02411         base::utils::DateTime::getDateTime(logFormat->dateTimeFormat().c_str(),
02412                                            &tc->subsecondPrecision(logMessage->level())));
02413   }
02414   if (logFormat->hasFlag(base::FormatFlags::Function)) {
02415     // Function
02416     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kLogFunctionFormatSpecifier,
      logMessage->func());
02417   }
02418   if (logFormat->hasFlag(base::FormatFlags::File)) {
02419     // File
02420     base::utils::Str::clearBuff(buff, base::consts::kSourceFilenameMaxLength);
02421     base::utils::File::buildStrippedFilename(logMessage->file().c_str(), buff);
02422     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kLogFileFormatSpecifier,
      std::string(buff));
02423   }
02424   if (logFormat->hasFlag(base::FormatFlags::FileBase)) {
02425     // FileBase
02426     base::utils::Str::clearBuff(buff, base::consts::kSourceFilenameMaxLength);
02427     base::utils::File::buildBaseFilename(logMessage->file(), buff);
02428     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kLogFileBaseFormatSpecifier,
      std::string(buff));
02429   }
02430   if (logFormat->hasFlag(base::FormatFlags::Line)) {
02431     // Line
02432     char* buf = base::utils::Str::clearBuff(buff, base::consts::kSourceLineMaxLength);
02433     buf = base::utils::Str::convertAndAddToBuff(logMessage->line(),
      base::consts::kSourceLineMaxLength, buf, bufLim, false);
02434     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kLogLineFormatSpecifier,
      std::string(buff));
02435   }
02436   if (logFormat->hasFlag(base::FormatFlags::Location)) {
02437     // Location
02438     char* buf = base::utils::Str::clearBuff(buff,
02439                                             base::consts::kSourceFilenameMaxLength +
      base::consts::kSourceLineMaxLength);
02440     base::utils::File::buildStrippedFilename(logMessage->file().c_str(), buff);
02441     buf = base::utils::Str::addToBuff(buff, buf, bufLim);
02442     buf = base::utils::Str::addToBuff(":", buf, bufLim);
02443     buf = base::utils::Str::convertAndAddToBuff(logMessage->line(),
      base::consts::kSourceLineMaxLength, buf, bufLim,
02444           false);
02445     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kLogLocationFormatSpecifier,
      std::string(buff));
02446   }
02447   if (logMessage->level() == Level::Verbose && logFormat->hasFlag(base::FormatFlags::VerboseLevel)) {
02448     // Verbose level
02449     char* buf = base::utils::Str::clearBuff(buff, 1);
02450     buf = base::utils::Str::convertAndAddToBuff(logMessage->verboseLevel(), 1, buf, bufLim, false);
```

```
02451     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kVerboseLevelFormatSpecifier,
      std::string(buff));
02452   }
02453   if (logFormat->hasFlag(base::FormatFlags::LogMessage)) {
02454     // Log message
02455     base::utils::Str::replaceFirstWithEscape(logLine, base::consts::kMessageFormatSpecifier,
      logMessage->message());
02456   }
02457 #if !defined(ELPP_DISABLE_CUSTOM_FORMAT_SPECIFIERS)
02458   el::base::threading::ScopedLock lock_(ELPP->customFormatSpecifiersLock());
02459   ELPP_UNUSED(lock_);
02460   for (std::vector<CustomFormatSpecifier>::const_iterator it =
      ELPP->customFormatSpecifiers()->begin();
02461        it != ELPP->customFormatSpecifiers()->end(); ++it) {
02462     std::string fs(it->formatSpecifier());
02463     base::type::string_t wcsFormatSpecifier(fs.begin(), fs.end());
02464     base::utils::Str::replaceFirstWithEscape(logLine, wcsFormatSpecifier, it->resolver()(logMessage));
02465   }
02466 #endif  // !defined(ELPP_DISABLE_CUSTOM_FORMAT_SPECIFIERS)
02467   if (appendNewLine) logLine += ELPP_LITERAL("\n");
02468   return logLine;
02469 }
02470
02471 // LogDispatcher
02472
02473 void LogDispatcher::dispatch(void) {
02474   if (m_proceed && m_dispatchAction == base::DispatchAction::None) {
02475     m_proceed = false;
02476   }
02477   if (!m_proceed) {
02478     return;
02479   }
02480 #ifndef ELPP_NO_GLOBAL_LOCK
02481   // see https://github.com/muflihun/easyloggingpp/issues/580
02482   // global lock is turned on by default unless
02483   // ELPP_NO_GLOBAL_LOCK is defined
02484   base::threading::ScopedLock scopedLock(ELPP->lock());
02485 #endif
02486   base::TypedConfigurations* tc = m_logMessage->logger()->m_typedConfigurations;
02487   if (ELPP->hasFlag(LoggingFlag::StrictLogFileSizeCheck)) {
02488     tc->validateFileRolling(m_logMessage->level(), ELPP->preRollOutCallback());
02489   }
02490   LogDispatchCallback* callback = nullptr;
02491   LogDispatchData data;
02492   for (const std::pair<std::string, base::type::LogDispatchCallbackPtr>& h
02493        : ELPP->m_logDispatchCallbacks) {
02494     callback = h.second.get();
02495     if (callback != nullptr && callback->enabled()) {
02496       data.setLogMessage(m_logMessage);
02497       data.setDispatchAction(m_dispatchAction);
02498       callback->handle(&data);
02499     }
02500   }
02501 }
02502
02503 // MessageBuilder
02504
02505 void MessageBuilder::initialize(Logger* logger) {
02506   m_logger = logger;
02507   m_containerLogSeparator = ELPP->hasFlag(LoggingFlag::NewLineForContainer) ?
02508                             ELPP_LITERAL("\n    ") : ELPP_LITERAL(", ");
02509 }
02510
02511 MessageBuilder& MessageBuilder::operator<<(const wchar_t* msg) {
02512   if (msg == nullptr) {
02513     m_logger->stream() << base::consts::kNullPointer;
02514     return *this;
02515   }
02516 #  if defined(ELPP_UNICODE)
02517   m_logger->stream() << msg;
02518 #  else
02519   char* buff_ = base::utils::Str::wcharPtrToCharPtr(msg);
02520   m_logger->stream() << buff_;
02521   free(buff_);
02522 #  endif
02523   if (ELPP->hasFlag(LoggingFlag::AutoSpacing)) {
02524     m_logger->stream() << " ";
02525   }
02526   return *this;
02527 }
02528
02529 // Writer
02530
02531 Writer& Writer::construct(Logger* logger, bool needLock) {
02532   m_logger = logger;
02533   initializeLogger(logger->id(), false, needLock);
02534   m_messageBuilder.initialize(m_logger);
```

```
02535   return *this;
02536 }
02537
02538 Writer& Writer::construct(int count, const char* loggerIds, ...) {
02539   if (ELPP->hasFlag(LoggingFlag::MultiLoggerSupport)) {
02540     va_list loggersList;
02541     va_start(loggersList, loggerIds);
02542     const char* id = loggerIds;
02543     m_loggerIds.reserve(count);
02544     for (int i = 0; i < count; ++i) {
02545       m_loggerIds.push_back(std::string(id));
02546       id = va_arg(loggersList, const char*);
02547     }
02548     va_end(loggersList);
02549     initializeLogger(m_loggerIds.at(0));
02550   } else {
02551     initializeLogger(std::string(loggerIds));
02552   }
02553   m_messageBuilder.initialize(m_logger);
02554   return *this;
02555 }
02556
02557 void Writer::initializeLogger(const std::string& loggerId, bool lookup, bool needLock) {
02558   if (lookup) {
02559     m_logger = ELPP->registeredLoggers()->get(loggerId,
      ELPP->hasFlag(LoggingFlag::CreateLoggerAutomatically));
02560   }
02561   if (m_logger == nullptr) {
02562     {
02563       if (!ELPP->registeredLoggers()->has(std::string(base::consts::kDefaultLoggerId))) {
02564         // Somehow default logger has been unregistered. Not good! Register again
02565         ELPP->registeredLoggers()->get(std::string(base::consts::kDefaultLoggerId));
02566       }
02567     }
02568     Writer(Level::Debug, m_file, m_line, m_func).construct(1, base::consts::kDefaultLoggerId)
02569         << "Logger [" << loggerId << "] is not registered yet!";
02570     m_proceed = false;
02571   } else {
02572     if (needLock) {
02573       m_logger->acquireLock();  // This should not be unlocked by checking m_proceed because
02574       // m_proceed can be changed by lines below
02575     }
02576     if (ELPP->hasFlag(LoggingFlag::HierarchicalLogging)) {
02577       m_proceed = m_level == Level::Verbose ? m_logger->enabled(m_level) :
02578                   LevelHelper::castToInt(m_level) >= LevelHelper::castToInt(ELPP->m_loggingLevel);
02579     } else {
02580       m_proceed = m_logger->enabled(m_level);
02581     }
02582   }
02583 }
02584
02585 void Writer::processDispatch() {
02586 #if ELPP_LOGGING_ENABLED
02587   if (ELPP->hasFlag(LoggingFlag::MultiLoggerSupport)) {
02588     bool firstDispatched = false;
02589     base::type::string_t logMessage;
02590     std::size_t i = 0;
02591     do {
02592       if (m_proceed) {
02593         if (firstDispatched) {
02594           m_logger->stream() << logMessage;
02595         } else {
02596           firstDispatched = true;
02597           if (m_loggerIds.size() > 1) {
02598             logMessage = m_logger->stream().str();
02599           }
02600         }
02601         triggerDispatch();
02602       } else if (m_logger != nullptr) {
02603         m_logger->stream().str(ELPP_LITERAL(""));
02604         m_logger->releaseLock();
02605       }
02606       if (i + 1 < m_loggerIds.size()) {
02607         initializeLogger(m_loggerIds.at(i + 1));
02608       }
02609     } while (++i < m_loggerIds.size());
02610   } else {
02611     if (m_proceed) {
02612       triggerDispatch();
02613     } else if (m_logger != nullptr) {
02614       m_logger->stream().str(ELPP_LITERAL(""));
02615       m_logger->releaseLock();
02616     }
02617   }
02618 #else
02619   if (m_logger != nullptr) {
02620     m_logger->stream().str(ELPP_LITERAL(""));
```

```
02621     m_logger->releaseLock();
02622   }
02623 #endif // ELPP_LOGGING_ENABLED
02624 }
02625
02626 void Writer::triggerDispatch(void) {
02627   try {
02628       if (m_proceed) {
02629         if (m_msg == nullptr) {
02630           LogMessage msg(m_level, m_file, m_line, m_func, m_verboseLevel,
02631                          m_logger);
02632           base::LogDispatcher(m_proceed, &msg, m_dispatchAction).dispatch();
02633         } else {
02634           base::LogDispatcher(m_proceed, m_msg, m_dispatchAction).dispatch();
02635         }
02636       }
02637       if (m_logger != nullptr) {
02638         m_logger->stream().str(ELPP_LITERAL(""));
02639         m_logger->releaseLock();
02640       }
02641       if (m_proceed && m_level == Level::Fatal
02642           && !ELPP->hasFlag(LoggingFlag::DisableApplicationAbortOnFatalLog)) {
02643         base::Writer(Level::Warning, m_file, m_line, m_func).construct(1,
    base::consts::kDefaultLoggerId)
02644             << "Aborting application. Reason: Fatal log at [" << m_file << ":" << m_line << "]";
02645         std::stringstream reasonStream;
02646         reasonStream << "Fatal log at [" << m_file << ":" << m_line << "]"
02647                      << " If you wish to disable 'abort on fatal log' please use "
02648                      << "el::Loggers::addFlag(el::LoggingFlag::DisableApplicationAbortOnFatalLog)";
02649         base::utils::abort(1, reasonStream.str());
02650       }
02651       m_proceed = false;
02652       }
02653     catch(std::exception & ex){
02654         // Extremely low memory situation; don't let exception be unhandled.
02655     }
02656 }
02657
02658 // PErrorWriter
02659
02660 PErrorWriter::~PErrorWriter(void) {
02661   if (m_proceed) {
02662 #if ELPP_COMPILER_MSVC
02663     char buff[256];
02664     strerror_s(buff, 256, errno);
02665     m_logger->stream() << ": " << buff << " [" << errno << "]";
02666 #else
02667     m_logger->stream() << ": " << strerror(errno) << " [" << errno << "]";
02668 #endif
02669   }
02670 }
02671
02672 // PerformanceTracker
02673
02674 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
02675
02676 PerformanceTracker::PerformanceTracker(const std::string& blockName,
02677                                        base::TimestampUnit timestampUnit,
02678                                        const std::string& loggerId,
02679                                        bool scopedLog, Level level) :
02680   m_blockName(blockName), m_timestampUnit(timestampUnit), m_loggerId(loggerId),
    m_scopedLog(scopedLog),
02681   m_level(level), m_hasChecked(false), m_lastCheckpointId(std::string()), m_enabled(false) {
02682 #if !defined(ELPP_DISABLE_PERFORMANCE_TRACKING) && ELPP_LOGGING_ENABLED
02683   // We store it locally so that if user happen to change configuration by the end of scope
02684   // or before calling checkpoint, we still depend on state of configuration at time of construction
02685   el::Logger* loggerPtr = ELPP->registeredLoggers()->get(loggerId, false);
02686   m_enabled = loggerPtr != nullptr && loggerPtr->m_typedConfigurations->performanceTracking(m_level);
02687   if (m_enabled) {
02688     base::utils::DateTime::gettimeofday(&m_startTime);
02689   }
02690 #endif  // !defined(ELPP_DISABLE_PERFORMANCE_TRACKING) && ELPP_LOGGING_ENABLED
02691 }
02692
02693 PerformanceTracker::~PerformanceTracker(void) {
02694 #if !defined(ELPP_DISABLE_PERFORMANCE_TRACKING) && ELPP_LOGGING_ENABLED
02695   if (m_enabled) {
02696     base::threading::ScopedLock scopedLock(lock());
02697     if (m_scopedLog) {
02698       base::utils::DateTime::gettimeofday(&m_endTime);
02699       base::type::string_t formattedTime = getFormattedTimeTaken();
02700       PerformanceTrackingData data(PerformanceTrackingData::DataType::Complete);
02701       data.init(this);
02702       data.m_formattedTimeTaken = formattedTime;
02703       PerformanceTrackingCallback* callback = nullptr;
02704       for (const std::pair<std::string, base::type::PerformanceTrackingCallbackPtr>& h
02705            : ELPP->m_performanceTrackingCallbacks) {
```

```
02706         callback = h.second.get();
02707         if (callback != nullptr && callback->enabled()) {
02708           callback->handle(&data);
02709         }
02710       }
02711     }
02712   }
02713 #endif  // !defined(ELPP_DISABLE_PERFORMANCE_TRACKING)
02714 }
02715
02716 void PerformanceTracker::checkpoint(const std::string& id, const char* file, base::type::LineNumber
      line,
02717                                     const char* func) {
02718 #if !defined(ELPP_DISABLE_PERFORMANCE_TRACKING) && ELPP_LOGGING_ENABLED
02719   if (m_enabled) {
02720     base::threading::ScopedLock scopedLock(lock());
02721     base::utils::DateTime::gettimeofday(&m_endTime);
02722     base::type::string_t formattedTime = m_hasChecked ? getFormattedTimeTaken(m_lastCheckpointTime) :
      ELPP_LITERAL("");
02723     PerformanceTrackingData data(PerformanceTrackingData::DataType::Checkpoint);
02724     data.init(this);
02725     data.m_checkpointId = id;
02726     data.m_file = file;
02727     data.m_line = line;
02728     data.m_func = func;
02729     data.m_formattedTimeTaken = formattedTime;
02730     PerformanceTrackingCallback* callback = nullptr;
02731     for (const std::pair<std::string, base::type::PerformanceTrackingCallbackPtr>& h
02732          : ELPP->m_performanceTrackingCallbacks) {
02733       callback = h.second.get();
02734       if (callback != nullptr && callback->enabled()) {
02735         callback->handle(&data);
02736       }
02737     }
02738     base::utils::DateTime::gettimeofday(&m_lastCheckpointTime);
02739     m_hasChecked = true;
02740     m_lastCheckpointId = id;
02741   }
02742 #endif  // !defined(ELPP_DISABLE_PERFORMANCE_TRACKING) && ELPP_LOGGING_ENABLED
02743   ELPP_UNUSED(id);
02744   ELPP_UNUSED(file);
02745   ELPP_UNUSED(line);
02746   ELPP_UNUSED(func);
02747 }
02748
02749 const base::type::string_t PerformanceTracker::getFormattedTimeTaken(struct timeval startTime) const {
02750   if (ELPP->hasFlag(LoggingFlag::FixedTimeFormat)) {
02751     base::type::stringstream_t ss;
02752     ss << base::utils::DateTime::getTimeDifference(m_endTime,
02753         startTime, m_timestampUnit) << " " <<
      base::consts::kTimeFormats[static_cast<base::type::EnumType>
02754             (m_timestampUnit)].unit;
02755     return ss.str();
02756   }
02757   return base::utils::DateTime::formatTime(base::utils::DateTime::getTimeDifference(m_endTime,
02758          startTime, m_timestampUnit), m_timestampUnit);
02759 }
02760
02761 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_PERFORMANCE_TRACKING)
02762
02763 namespace debug {
02764 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_CRASH_LOG)
02765
02766 // StackTrace
02767
02768 StackTrace::StackTraceEntry::StackTraceEntry(std::size_t index, const std::string& loc, const
      std::string& demang,
02769     const std::string& hex,
02770     const std::string& addr) :
02771   m_index(index),
02772   m_location(loc),
02773   m_demangled(demang),
02774   m_hex(hex),
02775   m_addr(addr) {
02776 }
02777
02778 std::ostream& operator<<(std::ostream& ss, const StackTrace::StackTraceEntry& si) {
02779   ss << "[" << si.m_index << "] " << si.m_location << (si.m_hex.empty() ? "" : "+") << si.m_hex << " " <<
      si.m_addr <<
02780      (si.m_demangled.empty() ? "" : ":") << si.m_demangled;
02781   return ss;
02782 }
02783
02784 std::ostream& operator<<(std::ostream& os, const StackTrace& st) {
02785   std::vector<StackTrace::StackTraceEntry>::const_iterator it = st.m_stack.begin();
02786   while (it != st.m_stack.end()) {
02787     os << "    " << *it++ << "\n";
```

```
02788   }
02789   return os;
02790 }
02791
02792 void StackTrace::generateNew(void) {
02793 #ifdef HAVE_EXECINFO
02794   m_stack.clear();
02795   void* stack[kMaxStack];
02796   unsigned int size = backtrace(stack, kMaxStack);
02797   char** strings = backtrace_symbols(stack, size);
02798   if (size > kStackStart) {  // Skip StackTrace c'tor and generateNew
02799     for (std::size_t i = kStackStart; i < size; ++i) {
02800       std::string mangName;
02801       std::string location;
02802       std::string hex;
02803       std::string addr;
02804
02805       // entry: 2   crash.cpp.bin                       0x0000000101552be5
      _ZN2el4base5debug10StackTraceC1Ev + 21
02806       const std::string line(strings[i]);
02807       auto p = line.find("_");
02808       if (p != std::string::npos) {
02809         mangName = line.substr(p);
02810         mangName = mangName.substr(0, mangName.find(" +"));
02811       }
02812       p = line.find("0x");
02813       if (p != std::string::npos) {
02814         addr = line.substr(p);
02815         addr = addr.substr(0, addr.find("_"));
02816       }
02817       // Perform demangling if parsed properly
02818       if (!mangName.empty()) {
02819         int status = 0;
02820         char* demangName = abi::__cxa_demangle(mangName.data(), 0, 0, &status);
02821         // if demangling is successful, output the demangled function name
02822         if (status == 0) {
02823           // Success (see
      http://gcc.gnu.org/onlinedocs/libstdc++/libstdc++-html-USERS-4.3/a01696.html)
02824           StackTraceEntry entry(i - 1, location, demangName, hex, addr);
02825           m_stack.push_back(entry);
02826         } else {
02827           // Not successful - we will use mangled name
02828           StackTraceEntry entry(i - 1, location, mangName, hex, addr);
02829           m_stack.push_back(entry);
02830         }
02831         free(demangName);
02832       } else {
02833         StackTraceEntry entry(i - 1, line);
02834         m_stack.push_back(entry);
02835       }
02836     }
02837   }
02838   free(strings);
02839 #else
02840   ELPP_INTERNAL_INFO(1, "Stacktrace generation not supported for selected compiler");
02841 #endif  // ELPP_STACKTRACE
02842 }
02843
02844 // Static helper functions
02845
02846 static std::string crashReason(int sig) {
02847   std::stringstream ss;
02848   bool foundReason = false;
02849   for (int i = 0; i < base::consts::kCrashSignalsCount; ++i) {
02850     if (base::consts::kCrashSignals[i].numb == sig) {
02851       ss << "Application has crashed due to [" << base::consts::kCrashSignals[i].name << "] signal";
02852       if (ELPP->hasFlag(el::LoggingFlag::LogDetailedCrashReason)) {
02853         ss << std::endl <<
02854             "    " << base::consts::kCrashSignals[i].brief << std::endl <<
02855             "    " << base::consts::kCrashSignals[i].detail;
02856       }
02857       foundReason = true;
02858     }
02859   }
02860   if (!foundReason) {
02861     ss << "Application has crashed due to unknown signal [" << sig << "]";
02862   }
02863   return ss.str();
02864 }
02866 static void logCrashReason(int sig, bool stackTraceIfAvailable, Level level, const char* logger) {
02867   if (sig == SIGINT && ELPP->hasFlag(el::LoggingFlag::IgnoreSigInt)) {
02868     return;
02869   }
02870   std::stringstream ss;
02871   ss << "CRASH HANDLED; ";
02872   ss << crashReason(sig);
02873 #if ELPP_STACKTRACE
```

```
02874   if (stackTraceIfAvailable) {
02875     ss « std::endl « "    ======= Backtrace: =========" « std::endl « base::debug::StackTrace();
02876   }
02877 #else
02878   ELPP_UNUSED(stackTraceIfAvailable);
02879 #endif  // ELPP_STACKTRACE
02880   ELPP_WRITE_LOG(el::base::Writer, level, base::DispatchAction::NormalLog, logger) « ss.str();
02881 }
02882
02883 static inline void crashAbort(int sig) {
02884   base::utils::abort(sig, std::string());
02885 }
02886
02890 static inline void defaultCrashHandler(int sig) {
02891   base::debug::logCrashReason(sig, true, Level::Fatal, base::consts::kDefaultLoggerId);
02892   base::debug::crashAbort(sig);
02893 }
02894
02895 // CrashHandler
02896
02897 CrashHandler::CrashHandler(bool useDefault) {
02898   if (useDefault) {
02899     setHandler(defaultCrashHandler);
02900   }
02901 }
02902
02903 void CrashHandler::setHandler(const Handler& cHandler) {
02904   m_handler = cHandler;
02905 #if defined(ELPP_HANDLE_SIGABRT)
02906   int i = 0;  // SIGABRT is at base::consts::kCrashSignals[0]
02907 #else
02908   int i = 1;
02909 #endif  // defined(ELPP_HANDLE_SIGABRT)
02910   for (; i < base::consts::kCrashSignalsCount; ++i) {
02911     m_handler = signal(base::consts::kCrashSignals[i].numb, cHandler);
02912   }
02913 }
02914
02915 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_CRASH_LOG)
02916 }  // namespace debug
02917 } // namespace base
02918
02919 // el
02920
02921 // Helpers
02922
02923 #if defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_CRASH_LOG)
02924
02925 void Helpers::crashAbort(int sig, const char* sourceFile, unsigned int long line) {
02926   std::stringstream ss;
02927   ss « base::debug::crashReason(sig).c_str();
02928   ss « " - [Called el::Helpers::crashAbort(" « sig « ")]";
02929   if (sourceFile != nullptr && strlen(sourceFile) > 0) {
02930     ss « " - Source: " « sourceFile;
02931     if (line > 0)
02932       ss « ":" « line;
02933     else
02934       ss « " (line number not specified)";
02935   }
02936   base::utils::abort(sig, ss.str());
02937 }
02938
02939 void Helpers::logCrashReason(int sig, bool stackTraceIfAvailable, Level level, const char* logger) {
02940   el::base::debug::logCrashReason(sig, stackTraceIfAvailable, level, logger);
02941 }
02942
02943 #endif // defined(ELPP_FEATURE_ALL) || defined(ELPP_FEATURE_CRASH_LOG)
02944
02945 // Loggers
02946
02947 Logger* Loggers::getLogger(const std::string& identity, bool registerIfNotAvailable) {
02948   return ELPP->registeredLoggers()->get(identity, registerIfNotAvailable);
02949 }
02950
02951 void Loggers::setDefaultLogBuilder(el::LogBuilderPtr& logBuilderPtr) {
02952   ELPP->registeredLoggers()->setDefaultLogBuilder(logBuilderPtr);
02953 }
02954
02955 bool Loggers::unregisterLogger(const std::string& identity) {
02956   return ELPP->registeredLoggers()->remove(identity);
02957 }
02958
02959 bool Loggers::hasLogger(const std::string& identity) {
02960   return ELPP->registeredLoggers()->has(identity);
02961 }
02962
02963 Logger* Loggers::reconfigureLogger(Logger* logger, const Configurations& configurations) {
```

```
02964   if (!logger) return nullptr;
02965   logger->configure(configurations);
02966   return logger;
02967 }
02968
02969 Logger* Loggers::reconfigureLogger(const std::string& identity, const Configurations& configurations)
    {
02970   return Loggers::reconfigureLogger(Loggers::getLogger(identity), configurations);
02971 }
02972
02973 Logger* Loggers::reconfigureLogger(const std::string& identity, ConfigurationType configurationType,
02974                                    const std::string& value) {
02975   Logger* logger = Loggers::getLogger(identity);
02976   if (logger == nullptr) {
02977     return nullptr;
02978   }
02979   logger->configurations()->set(Level::Global, configurationType, value);
02980   logger->reconfigure();
02981   return logger;
02982 }
02983
02984 void Loggers::reconfigureAllLoggers(const Configurations& configurations) {
02985   for (base::RegisteredLoggers::iterator it = ELPP->registeredLoggers()->begin();
02986        it != ELPP->registeredLoggers()->end(); ++it) {
02987     Loggers::reconfigureLogger(it->second, configurations);
02988   }
02989 }
02990
02991 void Loggers::reconfigureAllLoggers(Level level, ConfigurationType configurationType,
02992                                     const std::string& value) {
02993   for (base::RegisteredLoggers::iterator it = ELPP->registeredLoggers()->begin();
02994        it != ELPP->registeredLoggers()->end(); ++it) {
02995     Logger* logger = it->second;
02996     logger->configurations()->set(level, configurationType, value);
02997     logger->reconfigure();
02998   }
02999 }
03000
03001 void Loggers::setDefaultConfigurations(const Configurations& configurations, bool
    reconfigureExistingLoggers) {
03002   ELPP->registeredLoggers()->setDefaultConfigurations(configurations);
03003   if (reconfigureExistingLoggers) {
03004     Loggers::reconfigureAllLoggers(configurations);
03005   }
03006 }
03007
03008 const Configurations* Loggers::defaultConfigurations(void) {
03009   return ELPP->registeredLoggers()->defaultConfigurations();
03010 }
03011
03012 const base::LogStreamsReferenceMapPtr Loggers::logStreamsReference(void) {
03013   return ELPP->registeredLoggers()->logStreamsReference();
03014 }
03015
03016 base::TypedConfigurations Loggers::defaultTypedConfigurations(void) {
03017   return base::TypedConfigurations(
03018           ELPP->registeredLoggers()->defaultConfigurations(),
03019           ELPP->registeredLoggers()->logStreamsReference());
03020 }
03021
03022 std::vector<std::string>* Loggers::populateAllLoggerIds(std::vector<std::string>* targetList) {
03023   targetList->clear();
03024   for (base::RegisteredLoggers::iterator it = ELPP->registeredLoggers()->list().begin();
03025        it != ELPP->registeredLoggers()->list().end(); ++it) {
03026     targetList->push_back(it->first);
03027   }
03028   return targetList;
03029 }
03030
03031 void Loggers::configureFromGlobal(const char* globalConfigurationFilePath) {
03032   std::ifstream gcfStream(globalConfigurationFilePath, std::ifstream::in);
03033   ELPP_ASSERT(gcfStream.is_open(), "Unable to open global configuration file [" <<
    globalConfigurationFilePath
03034               << "] for parsing.");
03035   std::string line = std::string();
03036   std::stringstream ss;
03037   Logger* logger = nullptr;
03038   auto configure = [&](void) {
03039     ELPP_INTERNAL_INFO(8, "Configuring logger: '" << logger->id() << "' with configurations \n" <<
    ss.str()
03040                        << "\n--------------");
03041     Configurations c;
03042     c.parseFromText(ss.str());
03043     logger->configure(c);
03044   };
03045   while (gcfStream.good()) {
03046     std::getline(gcfStream, line);
```

```
03047     ELPP_INTERNAL_INFO(1, "Parsing line: " « line);
03048     base::utils::Str::trim(line);
03049     if (Configurations::Parser::isComment(line)) continue;
03050     Configurations::Parser::ignoreComments(&line);
03051     base::utils::Str::trim(line);
03052     if (line.size() > 2 && base::utils::Str::startsWith(line,
      std::string(base::consts::kConfigurationLoggerId))) {
03053       if (!ss.str().empty() && logger != nullptr) {
03054         configure();
03055       }
03056       ss.str(std::string(""));
03057       line = line.substr(2);
03058       base::utils::Str::trim(line);
03059       if (line.size() > 1) {
03060         ELPP_INTERNAL_INFO(1, "Getting logger: '" « line « "'");
03061         logger = getLogger(line);
03062       }
03063     } else {
03064       ss « line « "\n";
03065     }
03066   }
03067   if (!ss.str().empty() && logger != nullptr) {
03068     configure();
03069   }
03070 }
03071
03072 bool Loggers::configureFromArg(const char* argKey) {
03073 #if defined(ELPP_DISABLE_CONFIGURATION_FROM_PROGRAM_ARGS)
03074   ELPP_UNUSED(argKey);
03075 #else
03076   if (!Helpers::commandLineArgs()->hasParamWithValue(argKey)) {
03077     return false;
03078   }
03079   configureFromGlobal(Helpers::commandLineArgs()->getParamValue(argKey));
03080 #endif  // defined(ELPP_DISABLE_CONFIGURATION_FROM_PROGRAM_ARGS)
03081   return true;
03082 }
03083
03084 void Loggers::flushAll(void) {
03085   ELPP->registeredLoggers()->flushAll();
03086 }
03087
03088 void Loggers::setVerboseLevel(base::type::VerboseLevel level) {
03089   ELPP->vRegistry()->setLevel(level);
03090 }
03091
03092 base::type::VerboseLevel Loggers::verboseLevel(void) {
03093   return ELPP->vRegistry()->level();
03094 }
03095
03096 void Loggers::setVModules(const char* modules) {
03097   if (ELPP->vRegistry()->vModulesEnabled()) {
03098     ELPP->vRegistry()->setModules(modules);
03099   }
03100 }
03101
03102 void Loggers::clearVModules(void) {
03103   ELPP->vRegistry()->clearModules();
03104 }
03105
03106 // VersionInfo
03107
03108 const std::string VersionInfo::version(void) {
03109   return std::string("9.97.1");
03110 }
03112 const std::string VersionInfo::releaseDate(void) {
03113   return std::string("Thu Jul 20 2023 13:45:52 GMT+1000");
03114 }
03115
03116 } // namespace el
```

10.25 README.md File Reference

10.26 src/main.cpp File Reference

```
#include <easylogging++.h>
#include <iostream>
```

Namespaces

- namespace WIP

  Namespace for work in progress.

Functions

- void WIP::exampleEasyLogging ()

  Example of how to use easylogging with a configuration file.
- int main (int argc, char ∗argv[ ])

  Main function.

10.26.1 Function Documentation

10.26.1.1 main()

```
int main (
            int argc,
            char * argv[] )
```

Main function.

Codeconvention:

- Formatter: astyle

Definition at line 26 of file main.cpp.

References WIP::exampleEasyLogging().

10.27 main.cpp

Go to the documentation of this file.

```
00001 #include <easylogging++.h>
00002 #include <iostream>
00003
00013 INITIALIZE_EASYLOGGINGPP
00014
00015 namespace WIP {
00016 void exampleEasyLogging();
00017 }
00018
00026 int main(int argc, char *argv[]) {
00027   WIP::exampleEasyLogging();
00028   std::cout « "Hello, World!" « std::endl;
00029   return 0;
00030 }
00031
00039 namespace WIP {
00053 void exampleEasyLogging() {
00054   el::Configurations conf("conf/easylogging.conf");
00055   el::Loggers::reconfigureLogger("default", conf);
00056   el::Loggers::reconfigureAllLoggers(conf);
00057
00058   LOG(INFO) « "My first info log using default logger";
00059 }
00060 } // namespace WIP
```

Index