

OCCA OKL Transpiler

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Chapter 1

Hierarchical Index

1.1 Class Hierarchy

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Chapter 3

Class Documentation

3.1 oklt::ArgumentInfo Struct Reference

Represents an argument in a kernel function.

```
#include <kernel_metadata.h>
```

Collaboration diagram for oklt::ArgumentInfo:

Public Attributes

- bool [is_const](#)
Whether the argument is constant.
- [DataType](#) [dtype](#)
The data type of the argument.
- std::string [name](#)
The name of the argument.
- bool [is_ptr](#)
Whether the argument is a pointer.

3.1.1 Detailed Description

Represents an argument in a kernel function.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/kernel_metadata.h

3.2 oklt::AttrHandler Class Reference

Inheritance diagram for oklt::AttrHandler:

3.3 oklt::AttributedBarrier Struct Reference

Public Attributes

- BarrierType **type** = BarrierType::syncDefault

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

- /home/phile/projects/softserve/occa-transpiler/lib/attributes/frontend/params/barrier.h

3.4 oklt::AttributedDim Struct Reference

Public Attributes

- std::vector< std::string > **dim** = {}

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

- /home/phile/projects/softserve/occa-transpiler/lib/attributes/frontend/params/dim.h

3.5 oklt::AttributedDimOrder Struct Reference

Public Attributes

- std::vector< size_t > **idx** = {}

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

- /home/phile/projects/softserve/occa-transpiler/lib/attributes/frontend/params/dim.h

3.6 oklt::AttributedLoop Struct Reference

Public Attributes

- LoopType **type** = LoopType::Regular
- Axis **axis** = Axis::Auto

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

- /home/phile/projects/softserve/occa-transpiler/lib/attributes/frontend/params/loop.h

3.7 oklt::AttributedLoopInnerSize Struct Reference

Public Attributes

- `std::array< int, N_AXIS > size = {-1, -1, -1}`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/attributes/frontend/params/loop.h`

3.8 oklt::OkLoopInfo::AttributedTypeInfo Struct Reference

Public Attributes

- `bool declared = false`
- `bool used = false`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_info.h`

3.9 oklt::AttributedTypeMap Class Reference

```
#include <attributed_type_map.h>
```

Public Member Functions

- `bool add (const clang::QualType &qt, clang::Attr *attr)`
- `clang::AttrVec get (clang::ASTContext &ctx, const clang::QualType &qt)`
- `bool has (clang::ASTContext &ctx, const clang::QualType &qt, const llvm::SmallVector< clang::StringRef > &ids)`

3.9.1 Detailed Description

Holds a map of nodes and their custom attributes.

This class does not call attribute destructors, please take care of their proper destruction by calling `ASTContext::addDestruction(Attr)` after their creation.

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/attributed_type_map.h`
- `/home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/attributed_type_map.cpp`

3.10 oklt::DataType Struct Reference

Represents a data type in the metadata.

```
#include <kernel_metadata.h>
```

Public Attributes

- std::string [name](#)
The name of the data type.
- DatatypeCategory [typeCategory](#)
The category of the data type.
- int [bytes](#) = 0
The size of the data type in bytes. Used only for custom data types.
- std::list< [StructFieldInfo](#) > [fields](#)
The fields of the struct. Used only for struct data types.
- std::shared_ptr< [TupleElementDataType](#) > [tupleElementDType](#)
The data type of the tuple element. Used only for tuple data types.
- std::vector< std::string > [enumNames](#)
The names of the enum values. Used only for enum data types.

3.10.1 Detailed Description

Represents a data type in the metadata.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/kernel_metadata.h

3.11 DeltaTrees Class Reference

Public Member Functions

- **DeltaTrees** (clang::CompilerInstance &compiler)
- **DeltaTrees** (const clang::SourceManager &SM, const clang::LangOptions &LO)
- bool **Remove** (clang::SourceLocation loc, size_t size)
- bool **Remove** (clang::SourceRange range)
- bool **Insert** (clang::SourceLocation loc, size_t size, bool InsertAfter)
- bool **Replace** (clang::SourceLocation loc, size_t oldSize, size_t newSize)
- unsigned **getNewOffset** (clang::SourceLocation loc, bool afterInserts=false)
- unsigned **getNewOffset** (clang::SourceLocation loc, bool afterInserts=false) const
- unsigned **getNewOffset** (clang::FileID fid, uint32_t offset, bool afterInserts=false)
- unsigned **getNewOffset** (clang::FileID fid, uint32_t offset, bool afterInserts=false) const
- int **getRangeSize** (clang::SourceRange range) const

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/rewriter/delta/delta_trees.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/rewriter/delta/delta_trees.cpp

3.12 oklt::DependenciesInfo Struct Reference

Represents the dependencies of a program.

```
#include <kernel_metadata.h>
```

3.12.1 Detailed Description

Represents the dependencies of a program.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/kernel_metadata.h

3.13 oklt::DiagConsumer Class Reference

Inheritance diagram for oklt::DiagConsumer:

Collaboration diagram for oklt::DiagConsumer:

Public Member Functions

- **DiagConsumer** ([SessionStage](#) &session)
- [SessionStage](#) & **getSession** ()
- void **HandleDiagnostic** (clang::DiagnosticsEngine::Level Level, const clang::Diagnostic &Info) override
- bool **IncludeInDiagnosticCounts** () const override

Protected Attributes

- [SessionStage](#) & **_session**
- std::atomic_flag **_includeDiag** = true

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/diag/diag_consumer.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/diag/diag_consumer.cpp

3.14 oklt::DiagHandler Class Reference

Public Member Functions

- **DiagHandler** (unsigned id)
- virtual bool **HandleDiagnostic** ([SessionStage](#) &session, DiagLevel level, const clang::Diagnostic &info)=0

Protected Attributes

- unsigned **_id** = 0

Friends

- class **DiagConsumer**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/diag/diag_handler.h

3.15 oklt::DtreeRewriterProxy Class Reference

Inheritance diagram for oklt::DtreeRewriterProxy:

Collaboration diagram for oklt::DtreeRewriterProxy:

Public Member Functions

- **DtreeRewriterProxy** (clang::SourceManager &SM, const clang::LangOptions &LO)
- const [DeltaTrees](#) & **getDeltaTrees** () const
- bool **InsertText** (clang::SourceLocation Loc, clang::StringRef Str, bool InsertAfter=true, bool indentNew↵ Lines=false) override
- bool **InsertTextAfterToken** (clang::SourceLocation Loc, clang::StringRef Str) override
- bool [RemoveText](#) (clang::SourceLocation Start, unsigned Length, clang::Rewriter::RewriteOptions opts=clang::Rewriter::RewriteOptions()) override
RemoveText - Remove the specified text region.
- bool **ReplaceText** (clang::SourceLocation Start, unsigned OrigLength, clang::StringRef NewStr) override
- bool **ReplaceText** (clang::SourceRange range, clang::SourceRange replacementRange) override

Additional Inherited Members

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/rewriter/impl/dtree_rewriter_proxy.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/rewriter/impl/dtree_rewriter_proxy.cpp

3.16 oklt::EmptyParams Struct Reference

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

- /home/phile/projects/softserve/occa-transpiler/lib/attributes/frontend/params/empty_params.h

3.17 oklt::EmptyRewriterProxy Class Reference

Inheritance diagram for oklt::EmptyRewriterProxy:

Collaboration diagram for oklt::EmptyRewriterProxy:

Additional Inherited Members

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/rewriter/impl/empty_rewriter_proxy.h

3.18 oklt::Error Struct Reference

Represents an error with an error code, error description, and generic context.

```
#include <error.h>
```

Public Attributes

- std::error_code **ec**
The error code.
- std::string **desc**
The description of the error.
- std::any **ctx**
Any additional information about the error.`.

3.18.1 Detailed Description

Represents an error with an error code, error description, and generic context.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/error.h

3.19 oklt::func_num_arguments< FuncType > Struct Template Reference

Static Public Attributes

- static constexpr size_t **value**

3.19.1 Member Data Documentation

3.19.1.1 value

```
template<typename FuncType >
constexpr size_t oklt::func_num_arguments< FuncType >::value [static], [constexpr]
```

Initial value:

```
=
    std::tuple_size_v<typename function_traits<FuncType>::arguments>
```

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

- /home/phile/projects/softserve/occa-transpiler/lib/util/type_traits.h

3.20 oklt::func_param_type< FuncType, I > Struct Template Reference

Public Types

- using **type** = typename std::tuple_element_t< I, typename [function_traits](#)< FuncType >::arguments >

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

- /home/phile/projects/softserve/occa-transpiler/lib/util/type_traits.h

3.21 oklt::function_traits< x_Function > Struct Template Reference

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

- /home/phile/projects/softserve/occa-transpiler/lib/util/type_traits.h

3.22 oklt::function_traits< x_Result(x_Args...) > Struct Template Reference

Public Types

- using **arguments** = ::std::tuple< x_Args... >

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

- /home/phile/projects/softserve/occa-transpiler/lib/util/type_traits.h

3.23 oklt::HandleKeyBase Struct Reference

Inheritance diagram for oklt::HandleKeyBase:

Public Member Functions

- auto **key** () const
- bool **operator**< (const [HandleKeyBase](#) &rhs) const
- **HandleKeyBase** (HandleType k)

Public Attributes

- const HandleType **t**
- std::optional< TargetBackend > **backend**
- std::string **attr** = {}
- clang::ASTNodeKind **kind** = {}

Friends

- class **HandlerMap**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/handler_map.h

3.24 oklt::HandlerKey< H, E > Struct Template Reference

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/handler_map.h

3.25 oklt::HandlerKey< H, std::enable_if_t< H==HandleType::COMMON > > Struct Template Reference

Inheritance diagram for oklt::HandlerKey< H, std::enable_if_t< H==HandleType::COMMON > >:

Collaboration diagram for oklt::HandlerKey< H, std::enable_if_t< H==HandleType::COMMON > >:

Public Types

- typedef [AttrHandler](#) **HandlerType**

Public Member Functions

- `template<typename... Ts>`
HandlerKey (Ts &&... params)

Additional Inherited Members

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/attr_handler.h`

3.26 `oklt::HandlerKey< H, std::enable_if_t< H==HandleType::SEMA > >` Struct Template Reference

Inheritance diagram for `oklt::HandlerKey< H, std::enable_if_t< H==HandleType::SEMA > >`:

Collaboration diagram for `oklt::HandlerKey< H, std::enable_if_t< H==HandleType::SEMA > >`:

Public Types

- `typedef SemaHandler HandlerType`

Public Member Functions

- `template<typename... Ts>`
HandlerKey (Ts &&... params)

Additional Inherited Members

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/sema_handler.h`

3.27 `oklt::HandlerKey< T, std::enable_if_t< T==HandleType::BACKEND > >` Struct Template Reference

Inheritance diagram for `oklt::HandlerKey< T, std::enable_if_t< T==HandleType::BACKEND > >`:

Collaboration diagram for `oklt::HandlerKey< T, std::enable_if_t< T==HandleType::BACKEND > >`:

Public Types

- `typedef BackendHandler HandlerType`

Public Member Functions

- `template<typename... Ts>`
HandlerKey (Ts &&... params)

Additional Inherited Members

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/backend_handler.h`

3.28 oklt::HandlerKey< T, std::enable_if_t< T==HandleType::IMPLICIT > > Struct Template Reference

Inheritance diagram for oklt::HandlerKey< T, std::enable_if_t< T==HandleType::IMPLICIT > >:

Collaboration diagram for oklt::HandlerKey< T, std::enable_if_t< T==HandleType::IMPLICIT > >:

Public Types

- typedef [ImplicitHandler](#) **HandlerType**

Public Member Functions

- `template<typename... Ts>`
HandlerKey (Ts &&... params)

Additional Inherited Members

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/implicid_handler.h`

3.29 oklt::HandlerKey< T, std::enable_if_t< T==HandleType::PARSER > > Struct Template Reference

Inheritance diagram for oklt::HandlerKey< T, std::enable_if_t< T==HandleType::PARSER > >:

Collaboration diagram for oklt::HandlerKey< T, std::enable_if_t< T==HandleType::PARSER > >:

Public Types

- typedef [ParseHandler](#) **HandlerType**

Public Member Functions

- `template<typename... Ts>`
HandlerKey (Ts &&... params)

Additional Inherited Members

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/parse_handler.h`

3.30 oklt::HandlerManager Class Reference

Public Member Functions

- `bool` **hasImplicitHandler** (TargetBackend backend, clang::ASTNodeKind kind)
- `HandleResult` **parseAttr** ([SessionStage](#) &stage, const clang::Attr &attr)
- `HandleResult` **parseAttr** ([SessionStage](#) &stage, const clang::Attr &attr, [OKLParsedAttr](#) ¶ms)
- `HandleResult` **handleAttr** ([SessionStage](#) &stage, const clang::DynTypedNode &node, const clang::Attr &attr, const std::any *params)
- `HandleResult` **handleNode** ([SessionStage](#) &stage, const clang::DynTypedNode &node)
- `HandleResult` **handleSemaPre** ([SessionStage](#) &stage, const clang::DynTypedNode &node, const clang::Attr *attr)
- `tl::expected< std::set< const clang::Attr * >, Error >` **checkAttrs** ([SessionStage](#) &stage, const clang::DynTypedNode &node)

Static Public Member Functions

- `static HandleResult` **handleSemaPost** ([SessionStage](#) &stage, const clang::DynTypedNode &node, const clang::Attr *attr)

Friends

- `template<typename AttrFrontendType, typename F >`
`bool` **registerAttrFrontend** (std::string attr, F &func)
- `template<typename F >`
`bool` **registerCommonHandler** (std::string attr, F &func)
- `template<typename F >`
`bool` **registerBackendHandler** (TargetBackend, std::string attr, F &func)
- `template<typename F >`
`bool` **registerImplicitHandler** (TargetBackend, F &func)
- `template<typename F >`
`bool` **registerSemaHandler** (std::string attr, F &pre, F &post)

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/handler_manager.h`
- `/home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/handler_manager.cpp`

3.31 oklt::HandlerMap Class Reference

Public Member Functions

- template<enum HandleType H, typename T >
bool **insert** ([HandlerKey](#)< H > &&key, T &func)
- template<enum HandleType H, typename T >
bool **insert** ([HandlerKey](#)< H > &&key, T &pre, T &post)
- bool **hasHandler** (TargetBackend, clang::ASTNodeKind) const
- HandleResult **operator()** ([SessionStage](#) &, const clang::DynTypedNode &)
- bool **hasHandler** (const std::string &, clang::ASTNodeKind) const
- bool **hasHandler** (TargetBackend, const std::string &, clang::ASTNodeKind) const
- HandleResult **operator()** ([SessionStage](#) &, const clang::DynTypedNode &, const clang::Attr &, const std::any *params)
- bool **hasHandler** (const std::string &) const
- HandleResult **operator()** ([SessionStage](#) &stage, const clang::Attr &attr, [OKLParsedAttr](#) *params)
- bool **hasSemeHandler** (const std::string &, clang::ASTNodeKind) const
- HandleResult **pre** ([SessionStage](#) &, const clang::DynTypedNode &, const clang::Attr *)
- HandleResult **post** ([SessionStage](#) &, const clang::DynTypedNode &, const clang::Attr *)

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/handler_map.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/handler_map.cpp

3.32 oklt::HeaderDep Struct Reference

Public Attributes

- clang::SourceLocation **hashLoc**
- clang::Token **includeTok**
- std::string **fileName**
- bool **isAngled**
- clang::CharSourceRange **filenameRange**
- clang::OptionalFileEntryRef **file**
- std::string **searchPath**
- std::string **relativePath**
- const clang::Module * **imported**
- clang::SrcMgr::CharacteristicKind **fileType**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/header_info.h

3.33 oklt::HeaderDepsInfo Struct Reference

Public Attributes

- std::vector< [HeaderDep](#) > **topLevelDeps**
- std::vector< std::string > **backendHeaders**
- std::vector< std::string > **backendNss**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/header_info.h

3.34 oklt::ImplicitHandler Class Reference

Inheritance diagram for oklt::ImplicitHandler:

Collaboration diagram for oklt::ImplicitHandler:

Public Member Functions

- template<class F >
ImplicitHandler (F &func)
- HandleResult **handle** ([SessionStage](#) &stage, const clang::DynTypedNode &node) override

Friends

- class **HandlerMap**

Additional Inherited Members

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/implicid_handler.h

3.35 oklt::InclusionDirectiveCallback Class Reference

Inheritance diagram for oklt::InclusionDirectiveCallback:

Collaboration diagram for oklt::InclusionDirectiveCallback:

Public Member Functions

- **InclusionDirectiveCallback** ([HeaderDepsInfo](#) &depsInfo, const clang::SourceManager &sm)
- void **InclusionDirective** (clang::SourceLocation HashLoc, const clang::Token &IncludeTok, clang::StringRef fileName, bool IsAngled, clang::CharSourceRange FilenameRange, clang::OptionalFileEntryRef File, clang::StringRef SearchPath, clang::StringRef RelativePath, const clang::Module *Imported, clang::SrcMgr::CharacteristicKind FileType) override

Public Attributes

- [HeaderDepsInfo](#) & **deps**
- const clang::SourceManager & **sm**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/header_info.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/header_info.cpp

3.36 std::is_error_code_enum< OkltPipelineErrorCode > Struct Reference

Inheritance diagram for std::is_error_code_enum< OkltPipelineErrorCode >:

Collaboration diagram for std::is_error_code_enum< OkltPipelineErrorCode >:

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

- /home/phile/projects/softserve/occa-transpiler/lib/pipeline/core/error_codes.h

3.37 oklt::is_one_of<... > Struct Template Reference

Static Public Attributes

- static constexpr bool **value** = false

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

- /home/phile/projects/softserve/occa-transpiler/lib/util/type_traits.h

3.38 oklt::is_one_of< F, S, T... > Struct Template Reference

Static Public Attributes

- static constexpr bool **value** = std::is_same<F, S>::value || [is_one_of](#)<F, T...>::value

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

- /home/phile/projects/softserve/occa-transpiler/lib/util/type_traits.h

3.39 oklt::is_string< T > Struct Template Reference

Static Public Attributes

- static constexpr bool **value**

3.39.1 Member Data Documentation

3.39.1.1 value

```
template<typename T >
constexpr bool oklt::is_string< T >::value [static], [constexpr]
```

Initial value:

```
=
    is_one_of_v<T, std::string, std::wstring, std::u16string, std::u32string>
```

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

- /home/phile/projects/softserve/occa-transpiler/lib/util/type_traits.h

3.40 oklt::KernelInfo Struct Reference

Represents a kernel function.

```
#include <kernel_metadata.h>
```

Public Attributes

- std::string **name**
The name of the kernel function.
- std::vector< **ArgumentInfo** > **args**
The arguments of the kernel function.

3.40.1 Detailed Description

Represents a kernel function.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/kernel_metadata.h

3.41 oklt::NodeHandler Class Reference

Inheritance diagram for oklt::NodeHandler:

Public Member Functions

- virtual HandleResult **handle** ([SessionStage](#) &, const clang::DynTypedNode &)
- virtual HandleResult **handle** ([SessionStage](#) &, const clang::DynTypedNode &, const clang::Attr &, const std::any *)
- virtual HandleResult **handle** ([SessionStage](#) &, const clang::Attr &, [OKLParsedAttr](#) &)
- virtual HandleResult **pre** ([SessionStage](#) &, const clang::DynTypedNode &, const clang::Attr *)
- virtual HandleResult **post** ([SessionStage](#) &, const clang::DynTypedNode &, const clang::Attr *)

Protected Attributes

- clang::ASTNodeKind **kind** = {}

Friends

- class **HandlerMap**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/handler_map.h

3.42 oklt::OkIAttribute Struct Reference

Public Attributes

- std::string **raw**
- std::string **name**
- std::string **params**
- std::vector< size_t > **tok_indecies**

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

- /home/phile/projects/softserve/occa-transpiler/lib/pipeline/utis/okl_attribute.h

3.43 oklt::OKLAttrParam Class Reference

Public Member Functions

- **OKLAttrParam** (std::string_view raw, std::any v)
- std::string_view **getRaw** () const
return raw string representation
- bool **empty** ()
Checks if attribute is empty or not.
- bool **is_integral** ()
check if value is integer
- bool **is_unsigned** ()
check if value is unsigned integer
- bool **is_float** ()
check if value is a floating point
- bool **is_string** ()
check if value is a string
- bool **is_attr** ()
check if value is an OKL attribute
- bool **is_expr** ()
check if value is an expression
- template<typename T, typename std::enable_if_t< std::is_integral_v< T >, bool > = true>
bool **isa** () const
- template<typename T, typename std::enable_if_t< std::is_floating_point_v< T >, bool > = true>
bool **isa** () const
- template<typename T, typename std::enable_if_t< is_string_v< T >, bool > = true>
bool **isa** () const
- template<typename T, typename std::enable_if_t< std::is_same_v< T, OKLParsedAttr >, bool > = true>
bool **isa** () const
- template<typename F, typename S, typename... T>
bool **isa** () const
check if value if of given types
- template<typename T, typename std::enable_if_t< std::is_integral_v< T >, bool > = true>
std::optional< T > **get** () const
- template<typename T, typename std::enable_if_t< std::is_floating_point_v< T >, bool > = true>
std::optional< T > **get** () const
- template<typename T, typename std::enable_if_t< is_string_v< T >, bool > = true>
std::optional< T > **get** () const
- template<typename T, typename std::enable_if_t< std::is_same_v< std::remove_cv_t< T >, OKLParsedAttr >, bool > = true>
std::optional< T > **get** () const
- template<typename T >
bool **getTo** (T &v) const
get value to referenced buffer, return true on success.
- template<typename T >
void **getTo** (T &v, T &&u) const

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

- /home/phile/projects/softserve/occa-transpiler/lib/attributes/utils/parser.h
- /home/phile/projects/softserve/occa-transpiler/lib/attributes/utils/parser_impl.hpp

3.44 oklt::OkIKernelInfo Struct Reference

Inheritance diagram for oklt::OkIKernelInfo:

Public Member Functions

- **OkIKernelInfo** (const clang::FunctionDecl &decl)

Public Attributes

- const std::reference_wrapper< const clang::FunctionDecl > **decl**
- std::list< [OkILoopInfo](#) * > **topLevelOuterLoops** = {}
- std::list< [OkILoopInfo](#) > **topLevelLoops** = {}

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_info.h

3.45 oklt::OkILoopInfo Struct Reference

Collaboration diagram for oklt::OkILoopInfo:

Classes

- struct [AttributedTypeInfo](#)
- struct [OptSizes](#)

Public Types

- using **OptSize** = std::optional< size_t >

Public Member Functions

- bool **shouldSync** ()
- void **markSharedUsed** ()
- void **markExclusiveUsed** ()
- bool **isInc** () const
- bool **isUnary** () const
- [OkILoopInfo](#) * **getAttributedParent** ()
- [OkILoopInfo](#) * **getAttributedParent** (std::function< bool([OkILoopInfo](#) &)> f)
- [OkILoopInfo](#) * **getFirstAttributedChild** ()
- [OkILoopInfo](#) * **getFirstAttributedChild** (std::function< bool([OkILoopInfo](#) &)> f)
- size_t **getHeight** ()
- size_t **getHeightSameType** (const LoopType &)
- [OptSizes](#) **getInnerSizes** ()
- bool **is** (const LoopType &) const
- bool **is** (const LoopType &, const LoopType &) const
- bool **has** (const LoopType &) const
- bool **isTiled** () const
- bool **isRegular** () const
- bool **is** (const Axis &) const
- bool **is** (const Axis &, const Axis &) const
- bool **has** (const Axis &) const
- bool **updateAutoWithSpecificAxis** ()
- bool **isLastOuter** ()

Public Attributes

- const clang::Attr * **attr**
- const clang::ForStmt & **stmt**
- LoopTypes **type** = {LoopType::Regular}
- Axes **axis** = {Axis::Auto}
- [OklLoopInfo](#) * **parent** = nullptr
- std::list< [OklLoopInfo](#) > **children** = {}
- std::string **tileSize** = ""
- [AttributedTypeInfo](#) **sharedInfo**
- [AttributedTypeInfo](#) **exclusiveInfo**
- std::optional< [OptSizes](#) > **overriddenInnerSizes**
-
- struct {
 std::string **typeName**
 std::string **name**
 const clang::VarDecl * **varDecl**
 } **var**
-
- struct {
 const clang::Expr * **start**
 const clang::Expr * **end**
 size_t **size** = 0
 } **range**
-
- struct {
 const clang::BinaryOperator * **cmp**
 BinOp **op** = BinOp::Eq
 } **condition**
-
- struct {
 const clang::Expr * **val**
 union {
 UnOp **uo**
 BinOp **bo**
 } **op**
 } **inc**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_info.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_info.cpp

3.46 oklt::OKLParsedAttr Struct Reference

Public Member Functions

- **OKLParsedAttr** (std::string name)

- `template<typename T = OKLAttrParam>`
`std::optional< T > get (size_t n)`
- `template<typename T = OKLAttrParam>`
`T get (size_t n, T &&u)`
- `template<typename... T>`
`bool isa (size_t n)`
- `template<typename T = OKLAttrParam>`
`std::optional< T > get (const std::string &k)`
- `template<typename T = OKLAttrParam>`
`T get (const std::string &k, T &&u)`
- `template<typename... T>`
`bool isa (const std::string &k)`

Public Attributes

- `std::string name`
- `std::vector< OKLAttrParam > args`
- `std::map< std::string, OKLAttrParam > kwargs`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/attributes/utils/parser.h`
- `/home/phile/projects/softserve/occa-transpiler/lib/attributes/utils/parser_impl.hpp`

3.47 oklt::OkISemaCtx Struct Reference

Classes

- struct [ParsedKernelInfo](#)

Public Member Functions

- `void clear ()`
- `bool startParsingOkIKernel (const clang::FunctionDecl &)`
- `void stopParsingKernelInfo ()`
- `ParsedKernelInfo * getParsingKernelInfo ()`
- `void setParsedKernelInfo (ParsedKernelInfo *)`
- `bool isParsingOkIKernel () const`
- `bool isCurrentParsingOkIKernel (const clang::FunctionDecl &fd) const`
- `bool isDeclInLexicalTraversal (const clang::Decl &) const`
- `tl::expected< void, Error > startParsingAttributedForLoop (SessionStage &stage, const clang::ForStmt &stmt, const clang::Attr *attr, const std::any *params)`
- `tl::expected< void, Error > stopParsingAttributedForLoop (const clang::ForStmt &stmt, const clang::Attr *attr, const std::any *params)`
- `OkILoopInfo * getLoopInfo (const clang::ForStmt &forStmt) const`
- `OkILoopInfo * getLoopInfo ()`
- `void setLoopInfo (OkILoopInfo *loopInfo)`
- `ProgramMetaData & getProgramMetaData ()`
- `const ProgramMetaData & getProgramMetaData () const`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_ctx.h`
- `/home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_ctx.cpp`

3.48 oklt::OkLoopInfo::OptSizes Struct Reference

Inheritance diagram for oklt::OkLoopInfo::OptSizes:

Collaboration diagram for oklt::OkLoopInfo::OptSizes:

Public Member Functions

- `size_t product ()`
- `bool hasNullOpts ()`
- `bool allNullOpts ()`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_info.h`
- `/home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_info.cpp`

3.49 oklt::OriginalSourceMapper Class Reference

Public Member Functions

- `bool addOriginalLine (FiDUIntPair fidLineNumber, const std::string &line)`
- `bool addAttributeColumn (clang::SourceLocation loc, uint32_t col, oklt::Rewriter &rewriter, uint32_t addOffset=0)`
- `bool updateAttributeOffset (FiDUIntPair prevFidOffset, clang::SourceLocation newLoc, oklt::Rewriter &rewriter, uint32_t addOffset=0)`
- `const OriginalLines &getOriginalLines ()`
- `const AttributeColumns &getAttrOffsetToOriginalCol ()`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/original_source_mapper.h`
- `/home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/original_source_mapper.cpp`

3.50 oklt::OkISemaCtx::ParsedKernellInfo Struct Reference

Inheritance diagram for oklt::OkISemaCtx::ParsedKernellInfo:

Collaboration diagram for oklt::OkISemaCtx::ParsedKernellInfo:

Public Member Functions

- `ParsedKernellInfo (const clang::FunctionDecl &d)`

Public Attributes

- [OkLoopInfo](#) * **currentLoop** = nullptr
- std::map< const clang::ForStmt *, [OkLoopInfo](#) * > **loopMap** = {}

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/sema/okl_sema_ctx.h

3.51 oklt::ParseHandler Class Reference

Inheritance diagram for oklt::ParseHandler:

Collaboration diagram for oklt::ParseHandler:

Public Types

- using **HandlerType** = std::function< HandleResult([SessionStage](#) &, const clang::Attr &, [OKLParsedAttr](#) &)>

Public Member Functions

- **ParseHandler** (HandlerType func)
- HandleResult **handle** ([SessionStage](#) &stage, const clang::Attr &attr, [OKLParsedAttr](#) ¶ms) override

Additional Inherited Members

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/parse_handler.h

3.52 oklt::ProgramMetaData Struct Reference

Represents the metadata of a program.

```
#include <kernel_metadata.h>
```

Public Attributes

- std::optional< [DependenciesInfo](#) > **dependencies** = std::nullopt
- std::string **hash**
- std::list< [KernelInfo](#) > **kernels**
- std::optional< [PropertyInfo](#) > **props** = std::nullopt

3.52.1 Detailed Description

Represents the metadata of a program.

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

- `/home/phile/projects/softserve/occa-transpiler/include/oklt/core/kernel_metadata.h`

3.53 oklt::PropertyInfo Struct Reference

Represents some of the properties of a metadata.

```
#include <kernel_metadata.h>
```

Public Member Functions

- **NLOHMANN_DEFINE_TYPE_INTRUSIVE** ([PropertyInfo](#), compiler, compiler_flags, hash, mode, verbose)

Public Attributes

- `std::string` **compiler**
- `std::string` **compiler_flags**
- `std::string` **hash**
- `std::string` **mode**
- `bool` **verbose**

3.53.1 Detailed Description

Represents some of the properties of a metadata.

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

- `/home/phile/projects/softserve/occa-transpiler/include/oklt/core/kernel_metadata.h`

3.54 oklt::RewriterProxy Class Reference

Inheritance diagram for `oklt::RewriterProxy`:

Public Member Functions

- **RewriterProxy** (clang::SourceManager &SM, const clang::LangOptions &LO)
- virtual void **setSourceMgr** (clang::SourceManager &SM, const clang::LangOptions &LO)
- virtual clang::SourceManager & **getSourceMgr** () const
- virtual const clang::LangOptions & **getLangOpts** () const
- virtual int **getRangeSize** (clang::SourceRange Range, clang::Rewriter::RewriteOptions opts=clang::Rewriter::RewriteOptions()) const
- virtual int **getRangeSize** (const clang::CharSourceRange &Range, clang::Rewriter::RewriteOptions opts=clang::Rewriter::RewriteOptions()) const
- virtual std::string **getRewrittenText** (clang::CharSourceRange Range) const
- std::string **getRewrittenText** (clang::SourceRange Range) const
- virtual bool **InsertText** (clang::SourceLocation Loc, clang::StringRef Str, bool InsertAfter=true, bool indent↵ NewLines=false)
- bool **InsertTextAfter** (clang::SourceLocation Loc, clang::StringRef Str)
- virtual bool **InsertTextAfterToken** (clang::SourceLocation Loc, clang::StringRef Str)
- bool **InsertTextBefore** (clang::SourceLocation Loc, clang::StringRef Str)
- virtual bool **RemoveText** (clang::SourceLocation Start, unsigned Length, clang::Rewriter::RewriteOptions opts=clang::Rewriter::RewriteOptions())
RemoveText - Remove the specified text region.
- bool **RemoveText** (clang::CharSourceRange range, clang::Rewriter::RewriteOptions opts=clang::Rewriter::RewriteOptions())
Remove the specified text region.
- bool **RemoveText** (clang::SourceRange range, clang::Rewriter::RewriteOptions opts=clang::Rewriter::RewriteOptions())
- virtual bool **ReplaceText** (clang::SourceLocation Start, unsigned OrigLength, clang::StringRef NewStr)
- bool **ReplaceText** (clang::CharSourceRange range, clang::StringRef NewStr)
- bool **ReplaceText** (clang::SourceRange range, clang::StringRef NewStr)
- virtual bool **ReplaceText** (clang::SourceRange range, clang::SourceRange replacementRange)
- virtual bool **IncreaseIndentation** (clang::CharSourceRange range, clang::SourceLocation parentIndent)
- bool **IncreaseIndentation** (clang::SourceRange range, clang::SourceLocation parentIndent)
- virtual clang::RewriteBuffer & **getEditBuffer** (clang::FileID FID)
- virtual const clang::RewriteBuffer * **getRewriteBufferFor** (clang::FileID FID) const
- virtual clang::Rewriter::buffer_iterator **buffer_begin** ()
- virtual clang::Rewriter::buffer_iterator **buffer_end** ()
- virtual clang::Rewriter::const_buffer_iterator **buffer_begin** () const
- virtual clang::Rewriter::const_buffer_iterator **buffer_end** () const
- virtual bool **overwriteChangedFiles** ()

Static Public Member Functions

- static bool **isRewritable** (clang::SourceLocation Loc)

Protected Attributes

- clang::Rewriter **_rewriter**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/rewriter/rewriter_proxy.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/rewriter/rewriter_proxy.cpp

3.55 oklt::SemaHandler Class Reference

Inheritance diagram for oklt::SemaHandler:

Collaboration diagram for oklt::SemaHandler:

Public Member Functions

- template<class F >
SemaHandler (F &pre, F &post)
- HandleResult **pre** ([SessionStage](#) &stage, const clang::DynTypedNode &node, const clang::Attr *attr) override
- HandleResult **post** ([SessionStage](#) &stage, const clang::DynTypedNode &node, const clang::Attr *attr) override

Additional Inherited Members

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/handler_manager/sema_handler.h

3.56 oklt::SessionStage Class Reference

Collaboration diagram for oklt::SessionStage:

Public Member Functions

- **SessionStage** ([TranspilerSession](#) &session, clang::CompilerInstance &compiler, RewriterProxyType rw↔Type=RewriterProxyType::Original)
- const [TranspilerSession](#) & **getSession** () const
- [TranspilerSession](#) & **getSession** ()
- clang::CompilerInstance & **getCompiler** ()
- [oklt::Rewriter](#) & **getRewriter** ()
- std::string **getRewriterResultForMainFile** ()
- [TransformedFiles](#) **getRewriterResultForHeaders** ()
- TargetBackend **getBackend** () const
- [HandlerManager](#) & **getAttrManager** ()
- void **setLauncherMode** ()
- void **pushDiagnosticMessage** (clang::StoredDiagnostic &message)
- void **pushError** (std::error_code ec, std::string desc)
- void **pushError** (const [Error](#) &err)
- void **pushWarning** (std::string desc)
- bool **hasUserCtx** (const std::string &key)
- bool **setUserCtx** (const std::string &key, const std::any &ctx)
- std::any * **getUserCtx** (const std::string &key)
- template<typename T , typename... Args>
T & **tryEplaceUserCtx** (const std::string &key=typeid(T).name(), Args &&... args)

Protected Attributes

- [TranspilerSession](#) & **_session**
- TargetBackend **_backend**
- clang::CompilerInstance & **_compiler**
- std::unique_ptr< [oklt::Rewriter](#) > **_rewriter**
- std::map< std::string, std::any > **_userCtxMap**

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/session_stage.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/session_stage.cpp

3.57 oklt::StageAction Class Reference

Base stage action file tp run a transpiler pipeline.

```
#include <stage_action.h>
```

Inheritance diagram for oklt::StageAction:

Collaboration diagram for oklt::StageAction:

Public Member Functions

- **StageAction** (const [StageAction](#) &)=delete
- [StageAction](#) & **operator=** (const [StageAction](#) &)=delete
- bool **setSession** (SharedTranspilerSession session)
- bool [PrepareToExecuteAction](#) (clang::CompilerInstance &compiler) override
Base class for run a stage of transpiler pipeline.
- void **EndSourceFileAction** () override

Protected Member Functions

- virtual RewriterProxyType **getRewriterType** () const
- std::unique_ptr< clang::ASTConsumer > **CreateASTConsumer** (clang::CompilerInstance &CI, llvm::StringRef InFile) override

Protected Attributes

- std::unique_ptr< [SessionStage](#) > **_stage**
- SharedTranspilerSession **_session**
- std::string **_name**

3.57.1 Detailed Description

Base stage action file to run a transpiler pipeline.

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

- `/home/phile/projects/softserve/occa-transpiler/lib/pipeline/core/stage_action.h`
- `/home/phile/projects/softserve/occa-transpiler/lib/pipeline/core/stage_action.cpp`

3.58 oklt::StructFieldInfo Struct Reference

Represents a field in a struct or class.

```
#include <kernel_metadata.h>
```

Collaboration diagram for `oklt::StructFieldInfo`:

Public Attributes

- `DataType dtype`
The data type of the field.
- `std::string name`
The name of the field.

3.58.1 Detailed Description

Represents a field in a struct or class.

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

- `/home/phile/projects/softserve/occa-transpiler/include/oklt/core/kernel_metadata.h`

3.59 oklt::TileParams Struct Reference

Collaboration diagram for `oklt::TileParams`:

Public Attributes

- `std::string tileSize`
- `AttributedLoop firstLoop = AttributedLoop{}`
- `AttributedLoop secondLoop = AttributedLoop{}`
- `bool check = true`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/attributes/frontend/params/tile.h`

3.60 oklt::TransformedFiles Struct Reference

Public Attributes

- `std::map< std::string, std::string > fileMap`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/header_info.h`

3.61 oklt::TranspilationNode Struct Reference

Collaboration diagram for oklt::TranspilationNode:

Public Attributes

- `OkISemaCtx::ParsedKernelInfo * ki`
- `OkILoopInfo * li`
- `const clang::Attr * attr`
- `clang::DynTypedNode node`

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

- `/home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/transpilation_node.h`

3.62 oklt::TranspilerSession Struct Reference

Public Member Functions

- **TranspilerSession** (TargetBackend backend, std::string sourceCode)
- **TranspilerSession** (UserInput input)
- void **pushDiagnosticMessage** (clang::StoredDiagnostic &message, SessionStage &stage)
- void **pushError** (std::error_code ec, std::string desc)
- void **pushWarning** (std::string desc)
- const std::vector< Error > & **getErrors** () const
- std::vector< Error > & **getErrors** ()
- const std::vector< Warning > & **getWarnings** () const
- std::vector< Warning > & **getWarnings** ()
- OriginalSourceMapper & **getOriginalSourceMapper** ()
- const UserInput & **getInput** () const
- UserInput & **getInput** ()
- const UserOutput & **getOutput** () const
- UserOutput & **getOutput** ()
- void **moveOutputToInput** ()

Static Public Member Functions

- static SharedTranspilerSession **make** ([UserInput](#))
- static SharedTranspilerSession **make** (TargetBackend backend, std::string sourceCode)

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

- /home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/transpiler_session.h
- /home/phile/projects/softserve/occa-transpiler/lib/core/transpiler_session/transpiler_session.cpp

3.63 oklt::TupleElementDataType Struct Reference

Represents the data type of an element in a tuple.

```
#include <kernel_metadata.h>
```

Collaboration diagram for oklt::TupleElementDataType:

Public Attributes

- int64_t [tupleSize](#) = -1
The size of the tuple.
- [DataType](#) [elementDType](#)
The data type of the element.

3.63.1 Detailed Description

Represents the data type of an element in a tuple.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/kernel_metadata.h

3.64 oklt::UserInput Struct Reference

Represents the user input for transpilation, normalization or both.

```
#include <user_input.h>
```


Public Attributes

- TargetBackend [backend](#)
The target backend.
- std::string [source](#)
The source code of OKL program.
- std::map< std::string, std::string > [headers](#)
The headers.
- std::filesystem::path [sourcePath](#)
The path to the source file.
- std::vector< std::filesystem::path > [includeDirectories](#)
The include directories.
- std::vector< std::string > [defines](#)
The defined macroses.

3.64.1 Detailed Description

Represents the user input for transpilation, normalization or both.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/transpiler_session/user_input.h

3.65 oklt::UserOutput Struct Reference

Represents the output of transpilation or nortmalization.

```
#include <user_output.h>
```

Public Attributes

- ```
struct {
 std::string source
 The normalized source code.
 std::map< std::string, std::string > headers
} normalized
```
- ```
struct {
    std::string source
        The kernel source code.
    std::string metadata
        The kernel metadata (dumped as JSON)
} kernel
```
- ```
struct {
 std::string source
 The launcher source code.
 std::string metadata
 The launcher metadata (dumped as JSON)
} launcher
```

### 3.65.1 Detailed Description

Represents the output of transpilation or normalization.

### 3.65.2 Member Data Documentation

#### 3.65.2.1 headers

```
std::map<std::string, std::string> oklt::UserOutput::headers
```

The normalized headers (relative path of header -> normalized source code)

#### 3.65.2.2 metadata

```
std::string oklt::UserOutput::metadata
```

The kernel metadata (dumped as JSON)

The launcher metadata (dumped as JSON)

#### 3.65.2.3 source

```
std::string oklt::UserOutput::source
```

The normalized source code.

The launcher source code.

The kernel source code.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/transpiler\_session/user\_output.h

## 3.66 oklt::Warning Struct Reference

Represents a warning with a description.

```
#include <error.h>
```

### Public Attributes

- std::string [desc](#)  
*The description of the warning.*

### 3.66.1 Detailed Description

Represents a warning with a description.

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

- /home/phile/projects/softserve/occa-transpiler/include/oklt/core/error.h

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