FutureSynchronyzer

/doc

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- class AsyncFutureFactory

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Classes

- class AddNumberResultPolicy
- class NoPolicy

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- typedef NoPolicy NoResultPolicy

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5.2.1.1 typedef NoPolicy policy::NoResultPolicy

The class does nothing with the result passed to it's arguments

5.3 thread Namespace Reference

Classes

- class FutureSynchronyzer

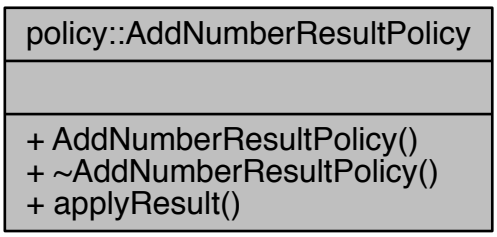
Chapter 6

Class Documentation

6.1 policy::AddNumberResultPolicy Class Reference

`#include <ResultPolicy.hxx>`

Collaboration diagram for policy::AddNumberResultPolicy:



Public Member Functions

- AddNumberResultPolicy ()
- virtual ~AddNumberResultPolicy ()
- template<typename OutputResult >
  void applyResult (OutputResult *out, OutputResult *otherValue)

6.1.1 Detailed Description

This class provides a policy to add a value to another one.

6.1.2 Constructor & Destructor Documentation

6.1.2.1 policy::AddNumberResultPolicy::AddNumberResultPolicy ( ) [inline]

6.1.2.2 virtual policy::AddNumberResultPolicy::~AddNumberResultPolicy ( ) [inline], [virtual]

6.1.3 Member Function Documentation

6.1.3.1 template<typename OutputResult > void policy::AddNumberResultPolicy::applyResult (OutputResult * *out*, OutputResult * *otherValue*) [inline]

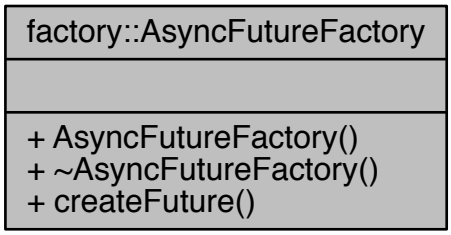
The documentation for this class was generated from the following file:

- ResultPolicy.hxx

6.2 factory::AsyncFutureFactory Class Reference

`#include <FutureFactory.hxx>`

Collaboration diagram for factory::AsyncFutureFactory:



Public Member Functions

- AsyncFutureFactory ()
- virtual ~AsyncFutureFactory ()
- template<typename OutputResult >
  std::future< OutputResult > createFuture (const std::function< OutputResult()> &f)

6.2.1 Detailed Description

This class provides a factory to build future with std::async methods.

6.2.2 Constructor & Destructor Documentation

6.2.2.1 factory::AsyncFutureFactory::AsyncFutureFactory ( ) [inline]

6.2.2.2 virtual factory::AsyncFutureFactory::~AsyncFutureFactory ( ) [inline], [virtual]

6.2.3 Member Function Documentation

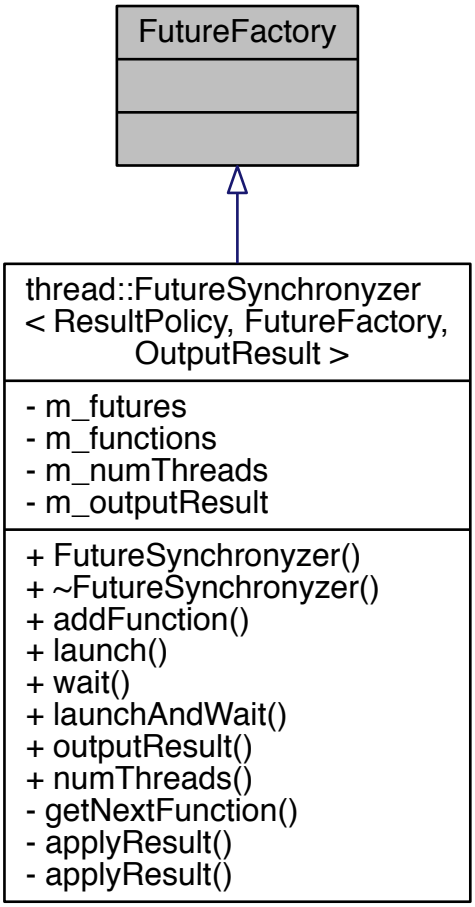
6.2.3.1 template<typename OutputResult > std::future<OutputResult> factory::AsyncFutureFactory::createFuture (const std::function< OutputResult()> & *f*) [inline]

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

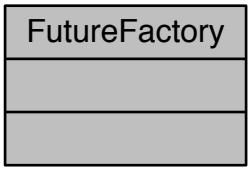
- FutureFactory.hxx

6.3 FutureFactory Class Reference

Inheritance diagram for FutureFactory:



Collaboration diagram for FutureFactory:



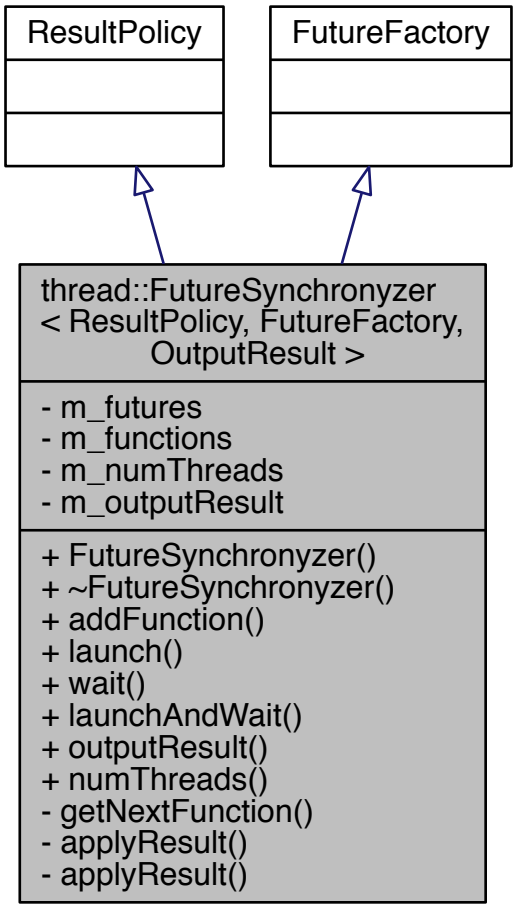
The documentation for this class was generated from the following file:

- FutureSynchronyzer.hxx

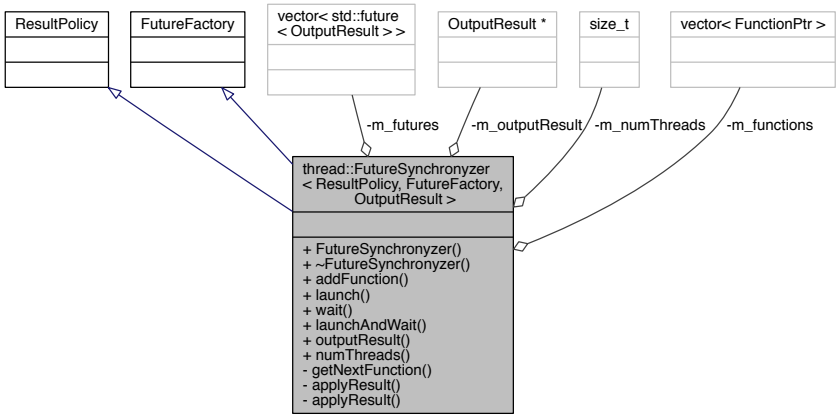
6.4 thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult > Class Template Reference

`#include <FutureSynchronyzer.hxx>`

Inheritance diagram for thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >:



Collaboration diagram for thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >:



Public Member Functions

- FutureSynchronyzer (OutputResult *outputResult=NULL, size_t numThreads=std::thread::hardware_concurrency() > 0?std::thread::hardware_concurrency():1)
- virtual ~FutureSynchronyzer ()
- template<typename Fn , typename... Args>
  void addFunction (Fn &&function, Args &&...args)
- void launch ()
- void wait ()
- void launchAndWait ()
- OutputResult * outputResult () const
- size_t numThreads () const

Private Types

- typedef std::function< OutputResult()> Function
- typedef std::shared_ptr< Function > FunctionPtr

Private Member Functions

- FunctionPtr getNextFunction ()
- template<typename Output = OutputResult, typename Policy = ResultPolicy>
  std::enable_if<!(std::is_same< Output, void >::value)&&!(std::is_same< Policy, policy::NoResultPolicy >::value), void >::type applyResult (std::future< Output > &f)
- template<typename Output = OutputResult, typename Policy = ResultPolicy>
  std::enable_if<(std::is_same< Output, void >::value)||(std::is_same< Policy, policy::NoResultPolicy >::value), void >::type applyResult (std::future< Output > &f)

Private Attributes

- std::vector< std::future< OutputResult > > m_futures
- std::vector< FunctionPtr > m_functions
- size_t m_numThreads
- OutputResult * m_outputResult

6.4.1 Detailed Description

template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void>class thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >

This class permits to add functions and it's arguments and launch them with a limit number of threads defined at the onbject's construction. All the function added must returned the same type of argument.

6.4.2 Member Typedef Documentation

6.4.2.1 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> typedef std::function<OutputResult()> thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::Function [private]

6.4.2.2 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> typedef std::shared_ptr<Function> thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::FunctionPtr [private]

6.4.3 Constructor & Destructor Documentation

6.4.3.1 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::FutureSynchronyzer (OutputResult * *outputResult* = NULL, size_t *numThreads* = std::thread::hardware_concurrency(), 0?std::thread::hardware_concurrency():1) [inline]

Construct the Future Synchronizer.

Parameters

outputResult	the return result (optional);
numThreads	the max number of threads. By default, the number of concurrent threads supported if detected or 1.

6.4.3.2 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> virtual thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::~FutureSynchronyzer ( ) [inline], [virtual]

6.4.4 Member Function Documentation

6.4.4.1 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> template<typename Fn , typename... Args> void thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::addFunction (Fn && *function,* Args &&... *args*) [inline]

Add the function and its arguments to the list of function

Parameters

function	
args	all arguments

6.4.4.2 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> template<typename Output = OutputResult, typename Policy = ResultPolicy> std::enable_if<!(std::is_same<Output, void>::value) && !(std::is_same<Policy, policy::NoResultPolicy>::value), void>::type thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::applyResult (std::future< Output > & *f*) [inline], [private]

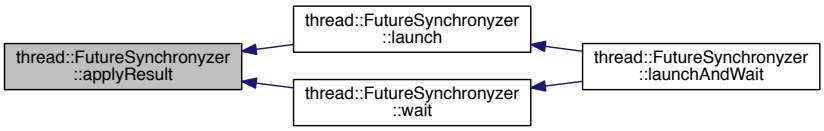
Launch the result operation. This method is used if OutputResult is not void and ResultPolicy is not ResultPolicy.

Parameters

f	the finished future with the result

Referenced by thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::launch(), and thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::wait().

Here is the caller graph for this function:



6.4.4.3 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> template<typename Output = OutputResult, typename Policy = ResultPolicy> std::enable_if<(std::is_same<Output, void>::value) || (std::is_same<Policy, policy::NoResultPolicy>::value), void>::type thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::applyResult (std::future< Output > & *f*) [inline], [private]

Launch the result operation. This method is used if OutputResult is void or ResultPolicy is ResultPolicy.

Parameters

f	the finished future with the result

References UNUSED.

6.4.4.4 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> FunctionPtr thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::getNextFunction ( ) [inline], [private]

Returns

the next function to be treated.

Referenced by thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::launch().

Here is the caller graph for this function:

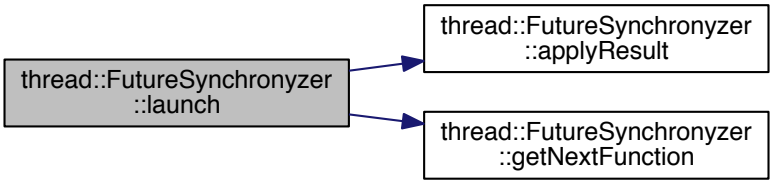
6.4.4.5 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> void thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::launch ( ) [inline]

Launch all functions

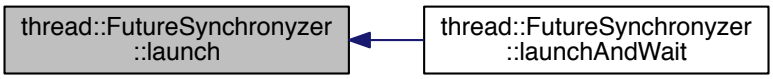
References thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::applyResult(), thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::getNextFunction(), and thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::m_numThreads.

Referenced by thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::launchAndWait().

Here is the call graph for this function:



Here is the caller graph for this function:

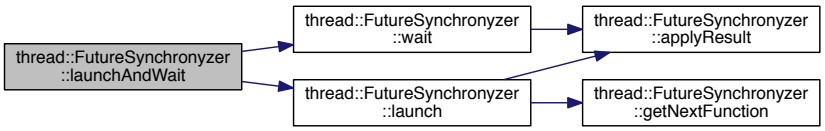


6.4.4.6 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> void thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::launchAndWait ( ) [inline]

Launch all the functions and wait them to be finished.

References thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::launch(), and thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::wait().

Here is the call graph for this function:



6.4.4.7 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> size_t thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::numThreads ( ) const [inline]

References thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::m_numThreads.

6.4.4.8 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> OutputResult* thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::outputResult ( ) const [inline]

References thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::m_outputResult.

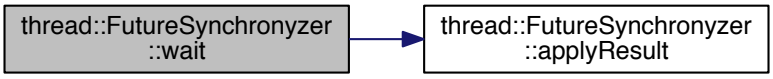
6.4.4.9 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> void thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::wait ( ) [inline]

Wait all functions to be finished.

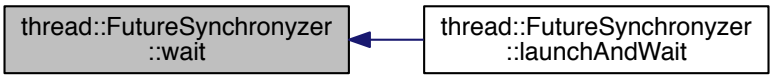
References thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::applyResult().

Referenced by thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::launchAndWait().

Here is the call graph for this function:



Here is the caller graph for this function:



6.4.5 Member Data Documentation

6.4.5.1 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> std::vector<FunctionPtr> thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::m_functions [private]

6.4.5.2 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> std::vector<std::future<OutputResult> > thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::m_futures [private]

6.4.5.3 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> size_t thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::m_numThreads [private]

Referenced by thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::launch(), and thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::numThreads().

6.4.5.4 template<class ResultPolicy = policy::NoResultPolicy, class FutureFactory = factory::AsyncFutureFactory, typename OutputResult = void> OutputResult* thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::m_outputResult [private]

Referenced by thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::outputResult().

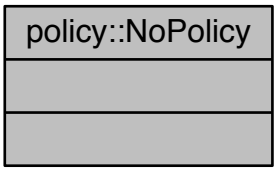
The documentation for this class was generated from the following file:

- FutureSynchronyzer.hxx

6.5 policy::NoPolicy Class Reference

```
#include <Policy.hxx>
```

Collaboration diagram for policy::NoPolicy:



6.5.1 Detailed Description

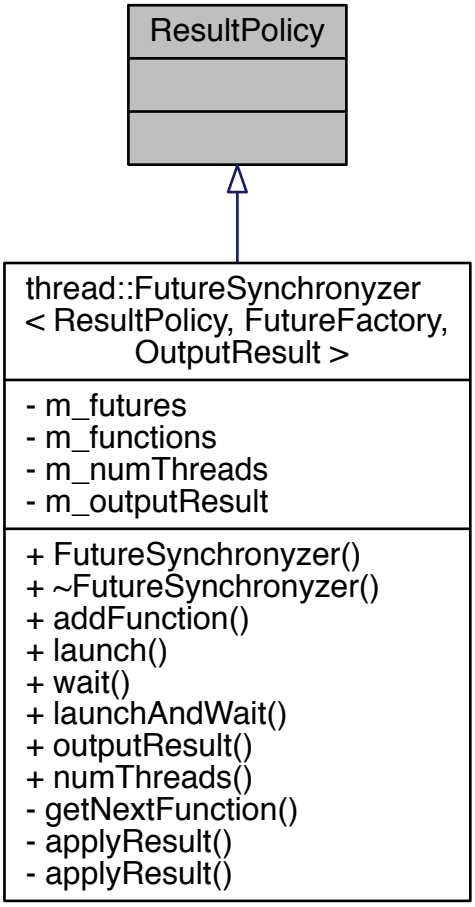
This class represents an empty policy

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

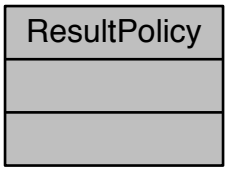
- Policy.hxx

6.6 ResultPolicy Class Reference

Inheritance diagram for ResultPolicy:



Collaboration diagram for ResultPolicy:



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

- FutureSynchronyzer.hxx

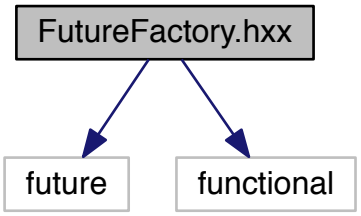
Chapter 7

File Documentation

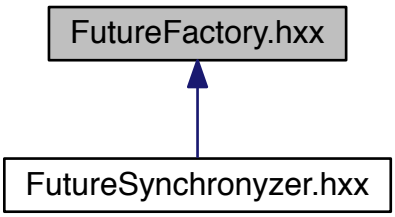
7.1 FutureFactory.hxx File Reference

```
#include <future>
#include <functional>
```

Include dependency graph for FutureFactory.hxx:



This graph shows which files directly or indirectly include this file:



Classes

- class factory::AsyncFutureFactory

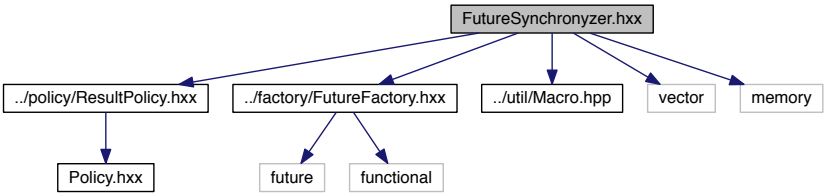
Namespaces

- factory

7.2 FutureSynchronyzer.hxx File Reference

```
#include "../policy/ResultPolicy.hxx"
#include "../factory/FutureFactory.hxx"
#include "../util/Macro.hpp"
#include <vector>
#include <memory>
```

Include dependency graph for FutureSynchronyzer.hxx:



Classes

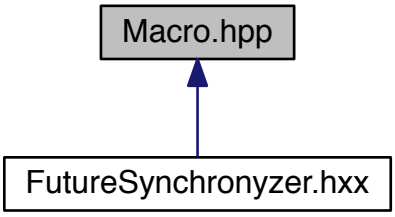
- class thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >

Namespaces

- thread

7.3 Macro.hpp File Reference

This graph shows which files directly or indirectly include this file:



Macros

- #define UNUSED(x) (void)(x)

7.3.1 Macro Definition Documentation

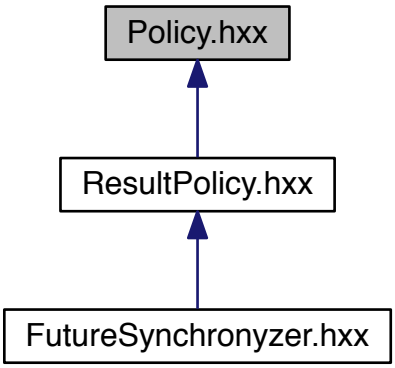
7.3.1.1 #define UNUSED(*x*) (void)(x)

This macro avoid warning of unused parameter

Referenced by thread::FutureSynchronyzer< ResultPolicy, FutureFactory, OutputResult >::applyResult().

7.4 Policy.hxx File Reference

This graph shows which files directly or indirectly include this file:



Classes

- class policy::NoPolicy

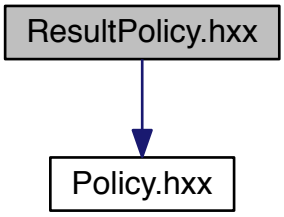
Namespaces

- policy

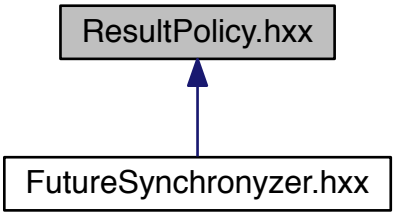
7.5 ResultPolicy.hxx File Reference

```
#include "Policy.hxx"
```

Include dependency graph for ResultPolicy.hxx:



This graph shows which files directly or indirectly include this file:



Classes

- class policy::AddNumberResultPolicy

Namespaces

- policy

Typedefs

- typedef NoPolicy policy::NoResultPolicy