std::thread

Defined in header <thread>

```
class thread;        (since C++11)
```

The class thread represents a single thread of execution . Threads allow multiple functions to execute concurrently.

Threads begin execution immediately upon construction of the associated thread object (pending any OS scheduling delays), starting at the top-level function provided as a constructor argument. The return value of the top-level function is ignored and if it terminates by throwing an exception, std::terminate is called. The top-level function may communicate its return value or an exception to the caller via std::promise or by modifying shared variables (which may require synchronization, see std::mutex and std::atomic)

std::thread objects may also be in the state that does not represent any thread (after default construction, move from, detach, or join), and a thread of execution may be not associated with any thread objects (after detach).

No two std::thread objects may represent the same thread of execution; std::thread is not *CopyConstructible* or *CopyAssignable*, although it is *MoveConstructible* and *MoveAssignable*.

Member types

Member type	Definition
native_handle_type(optional)	*implementation-defined*

Member classes

id	represents the *id* of a thread (public member class)

Member functions

(constructor)	constructs new thread object (public member function)
(destructor)	destructs the thread object, underlying thread must be joined or detached (public member function)
operator=	moves the thread object (public member function)

Observers

joinable	checks whether the thread is joinable, i.e. potentially running in parallel context (public member function)
get_id	returns the *id* of the thread (public member function)
native_handle	returns the underlying implementation-defined thread handle (public member function)
hardware_concurrency [static]	returns the number of concurrent threads supported by the implementation (public static member function)

Operations

join	waits for a thread to finish its execution (public member function)
detach	permits the thread to execute independently from the thread handle (public member function)
swap	swaps two thread objects (public member function)

Non-member functions

std::swap(std::thread) (C++11)	specializes the std::swap algorithm (function)