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Subject: Job package: A lightweight worker thread for non-blocking operations.  
Posted by [Oblivion](#) on Sun, 10 Sep 2017 10:29:46 GMT

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Hello,

Below you will find a worker thread implementation which -hopefully- can simplify creating non-blocking or asynchronous applications, or allow you to easily port your applications to MT-era. I also supplied an example code demonstrating its basic usage pattern.

#### Job package for Ultimate++

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This template class implements a scope bound, single worker thread based on RAII principle. It provides a return semantics for result gathering, functionally similar to promise/future pattern (including void type specialization). Also it provides a convenient error management and exception propagation mechanisms for worker threads, and it is compatible with U++ single-threaded mode.

Note that while Job is a general purpose multithreading tool, for high performance loop parallelization scenarios CoWork would be a more suitable option. This class is mainly designed to allow applications and libraries to gain an easily manageable, optional non-blocking behavior where high latency is expected such as network operations and file I/O, and a safe, container-style access to the data processed by the worker threads is preferred.

#### Features and Highlights

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- A safe way to gather results from worker threads.
- Simple and easy-to-use thread halting, and error reporting mechanism.
- Exception propagation.
- External blocking is possible.
- Optional constant reference access to job results.
- Compatible with U++ single-threaded environment.
- All Job instances are scope bound and will forced to finish job when they get out of scope.

#### Known Issues

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- Currently none.

#### History

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- 2017-10-07: Compatibility with U++ single-threaded mode is added.

- 2017-10-01: Global variables moved into JobGlobal namespace in order to avoid multiple definitions error. Accordingly, global functions are defined in Job.cpp.
- 2017-09-22: Exception propagation mechanism for job is properly added. From now on worker threads will pass exceptions to their caller.  
Void template specialization is re-implemented (without using future/promise).  
Constant reference access operator is added. This is especially useful where the data is a container with iterators (such as Vector or Array).
- 2017-09-19: std::exception class exceptions are handled, and treated as errors.  
(For the time being.)  
void instantiation is now possible.  
Jobs will notify their workers on shutdown.  
Clean up & cosmetics...
- 2017-09-18: Clear() method is added. Worker id generator is using int64. Documentation updated.
- 2017-09-17: Future/promise mechanism, and std template library code completely removed.  
From now on Job has its own result gathering mechanism with zero copy/move overhead.
- 2017-09-16: Job is redesigned. It is now a proper worker thread.
- 2017-09-10: Initial public beta version is released.

Hope you'll find it useful.

Best Regards,  
Oblivion

## File Attachments

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1) [Job Package and Examples.zip](#), downloaded 513 times

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