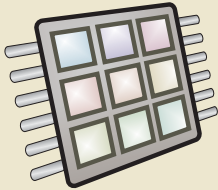




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Multicore Software Engineering Young Investigator Group

HowTo-Guide

Getting started with POSIX Threads

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1 Getting started with POSIX threads

The POSIX standard library for creating and managing threads is called `pthread`. This section describes how to set up your environment to be able to compile programs like the Pthreads-“Hello world” example shown in figure 1.

```
#include <pthread.h>
#include <stdio.h>

void* hello(void* id) {
    printf("%d: Hello world!\n", *((int*) id));
    return 0;
}

int main(int argc, char* argv[])
{
    const int COUNT = 5;
    int i;
    pthread_t thread[COUNT];
    int ids[COUNT];

    for (i = 0; i < COUNT; i++) {
        ids[i] = i;
        int retval = pthread_create(&thread[i], NULL, hello, &ids[i]);
        if (retval) {
            perror("pthread_create failed");
            return 1;
        }
    }

    for (i = 0; i < COUNT; i++) pthread_join(thread[i], NULL);
    return 0;
}
```

Figure 1: A hello-world program using POSIX threads.

1.1 Linux

`libpthread` is included in the `glibc` standard library, so no extra steps should be necessary (except for possibly installing the header files, which e. g. in Debian reside in package `libc6-dev`). You should be able to compile programs using POSIX threads e. g. with

```
$ gcc -o hello hello-pthread.c -lpthread
```

1.2 Windows

1.2.1 gcc

Install GCC for Windows from the MinGW project <http://www.mingw.org/>, you need the “MinGW Runtime” package.

1.2.2 pthreads

Download the pthreads-win32 library from <http://sourceware.org/pthreads-win32/>. The easiest way is to get `pthread-w32-v-v-v-release.exe` (with current version number `v`) which is a self-extracting archive.

Unpack the archive and copy the files from the directory `Pre-built.2` into the MinGW-installation as follows: (`$MINGW` refers to the root directory of the installation, e. g. `C:\mingw`)

```
include/*      → $MINGW/include
lib/*.dll      → $MINGW/bin
lib/* (the rest) → $MINGW/lib
```

Include `$MINGW/bin` into your `PATH` environment variable. You should now be able to compile programs using POSIX threads, e. g. with

```
C:\>gcc.exe -o hello hello-pthread.c -lpthread
```