1. Hello, world of concurrency in C++!

This chapter covers

- What is meant by concurrency and multithreading
- Why you might want to use concurrency and multithreading in your applications
- Some of the history of the support for concurrency in C++
- What a simple multithreaded C++ program looks like

These are exciting times for C++ users. Thirteen years after the original C++ Standard was published in 1998, the C++ Standards Committee is giving the language and its supporting library a major overhaul. The new C++ Standard (referred to as C++11 or C++0x) was published in 2011 and brings with it a whole swathe of changes that will make working with C++ easier and more productive.

One of the most significant new features in the C++11 Standard is the support of multithreaded programs. For the first time, the C++ Standard will acknowledge the existence of multithreaded applications in the language and provide components in the library for writing multithreaded applications. This will make it possible to write multithreaded C++ programs without relying on platform-specific extensions and thus allow writing portable multithreaded code with guaranteed behavior. It also comes at a time when programmers are increasingly looking to concurrency in general, and multithreaded programming in particular, to improve application performance.

This book is about writing programs in C++ using multiple threads for concurrency and the C++ language features and library facilities that make that possible. I'll start by explaining what I mean by concurrency and multithreading and why you would want to use concurrency in your applications. After a quick detour into why you might *not* want to use it in your applications, I'll give an overview of the concurrency support in C++, and I'll round off this chapter with a simple example of C++ concurrency in action. Readers experienced with developing multithreaded applications may wish to skip the early sections. In subsequent chapters I'll cover more extensive examples and look at the library facilities in more depth. The book will finish with an in-depth reference to all the C++ Standard Library facilities for multithreading and concurrency.

So, what do I mean by *concurrency* and *multithreading*?