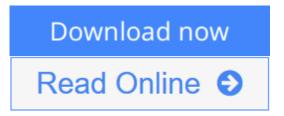# Mastering C# Concurrency

By Eugene Agafonov, Andrew Koryavchenko

Mastering C# Concurrency By Eugene Agafonov, Andrew Koryavchenko

Create robust and scalable applications along with responsive UI using concurrency and the multi-threading infrastructure in .NET and C#

About This Book

- Learn to combine your asynchronous operations with Task Parallel Library
- Master C#'s asynchronous infrastructure and use asynchronous APIs effectively to achieve optimal responsiveness of the application
- An easy-to-follow, example-based guide that helps you to build scalable applications using concurrency in C#

Who This Book Is For

If you are a C# developer who wants to develop modern applications in C# and wants to overcome problems by using asynchronous APIs and standard patterns, then this book is ideal for you. Reasonable development knowledge, an understanding of core elements and applications related to the .Net platform, and also the fundamentals of concurrency is assumed.

What You Will Learn

- Apply general multithreading concepts to your application's design
- Leverage lock-free concurrency and learn about its pros and cons to achieve efficient synchronization between user threads
- Combine your asynchronous operations with Task Parallel Library
- Make your code easier with C#'s asynchrony support
- Use common concurrent collections and programming patterns
- Write scalable and robust server-side asynchronous code
- Create fast and responsible client applications
- Avoid common problems and troubleshoot your multi-threaded and asynchronous applications

In Detail

Starting with the traditional approach to concurrency, you will learn how to write multithreaded concurrent programs and compose ways that won't require locking. You will explore the concepts of parallelism granularity, and fine-grained and coarse-grained parallel tasks by choosing a concurrent program structure and parallelizing the workload optimally. You will also learn how to use task parallel library, cancellations, timeouts, and how to handle errors. You will know how to choose the appropriate data structure for a specific parallel algorithm to achieve scalability and performance. Further, you'll learn about server scalability, asynchronous I/O, and thread pools, and write responsive traditional Windows and Windows Store applications.

By the end of the book, you will be able to diagnose and resolve typical problems that could happen in multithreaded applications.

Style and approach

An easy-to-follow, example-based guide that will walk you through the core principles of concurrency and multithreading using C#.

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Editorial Review

About the Author

Eugene Agafonov

Eugene Agafonov leads the Lingvo Live development department at ABBYY, and he lives and works in Moscow. He has over 15 years of professional experience in software development and has been working with C# ever since it was in beta version. He has been a Microsoft MVP in ASP.NET since 2006, and he often speaks at local software development conferences, such as DevCon Russia, about cutting-edge technologies in modern web and server-side application development. His main professional interests are cloud-based software architecture, scalability, and reliability. Eugene is a huge fan of football and plays the guitar with a local rock band. You can reach him at his personal blog at eugeneagafonov.com or his Twitter handle at @eugene_agafonov. He also wrote Multithreading in C# 5.0 Cookbook by Packt Publishing.

Andrew Koryavchenko

Andrew Koryavchenko is a software developer and an architect who lives in Moscow, Russia. He is one of the founders of rsdn.ru?the largest Russian software developers' community portal. His specialty is ERP systems and developer tools. He participated in ReSharper Visual Studio extension development, which is a well-known productivity tool for .NET developers. Currently, he is working on parsing and compilation tools for .NET development and also supports and develops the rsdn.ru portal. Andrew regularly speaks at online and offline events and conferences dedicated to Microsoft technologies, and he publishes articles on software development topics. He also used to teach Enterprise Software Development course in Kuban State University. Andrew has been a Microsoft MVP in C# since 2005.

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