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# Cloud Native Go

Building Reliable Services in  
Unreliable Environments



Matthew A. Titmus

# Cloud Native Go

What do Docker, Kubernetes, and Prometheus have in common? All of these cloud native technologies are written in the Go programming language. This practical book shows you how to use Go's strengths to develop cloud native services that are scalable and resilient, even in an unpredictable environment. You'll explore the composition and construction of these applications, from lower-level features of Go to mid-level design patterns to high-level architectural considerations.

Each chapter builds on the lessons of the last, walking intermediate to advanced developers through Go to construct a simple but fully featured distributed key-value store. You'll learn best practices for adopting Go as your development language for solving cloud native management and deployment issues.

- Learn how cloud native applications differ from other software architectures
- Understand how Go can solve the challenges of designing scalable, distributed services
- Leverage Go's lower-level features, such as channels and goroutines, to implement a reliable cloud native service
- Explore what "service reliability" is and what it has to do with "cloud native"
- Apply a variety of patterns, abstractions, and tooling to build and manage complex distributed systems

**Matthew A. Titmus** is a seasoned veteran of the software development industry with a degree in molecular biology. An early adopter and advocate of both cloud native technologies and the Go language, he's passionate about what it takes to make a production-quality system. Matthew has spent a lot of time implementing strategies for observing and orchestrating distributed systems.

"This book does a great job of bringing the high level concept of "cloud native" down to earth and implemented using the modern computing language Go. The marriage of the two concepts works well, and the result is great inspiration."

—Lee Atchison  
Owner, Atchison Technology LLC

"This is the first book I've come across that covers such a breadth and depth of modern cloud native practices in such a practical way. The patterns presented here have clear examples to solve real problems that are faced by engineers on a daily basis."

—Alvaro Atienza  
Site Reliability Engineer, Flatiron Health

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## Praise for *Cloud Native Go*

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—Alvaro Atienza  
Site Reliability Engineer, Flatiron Health

Matt’s expertise in the art and science of building reliable systems in a fundamentally unreliable world are clearly (and humorously) captured in the pages within. Join him as he introduces you to the fundamental building blocks and system designs that enable large scale, reliable systems to be constructed from the ephemeral and unreliable components that comprise the underlying cloud infrastructure of today’s modern computing environment.

—David Nicponski  
Principal Engineer, Robinhood

Over the past few years, two infrastructure trends have been happening: Go has been increasingly used for infrastructure, in addition to backend; and the infrastructure is moving to the cloud. This book summarizes the state of the art of the combination of the two.

—Natalie Pistunovich  
*Lead Developer Advocate, Aerospike*

I came in knowing next to nothing about Go, and left feeling like an expert. I would go so far as to say that simply reading this book made me a better engineer.

—James Quigley  
*Systems Reliability Engineer, Bloomberg*

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