

Building Scalable Backends With Go

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About Me

- Consulting Solutions Architect
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THE EXPERT'S VOICE® IN GO

Web Development with Go

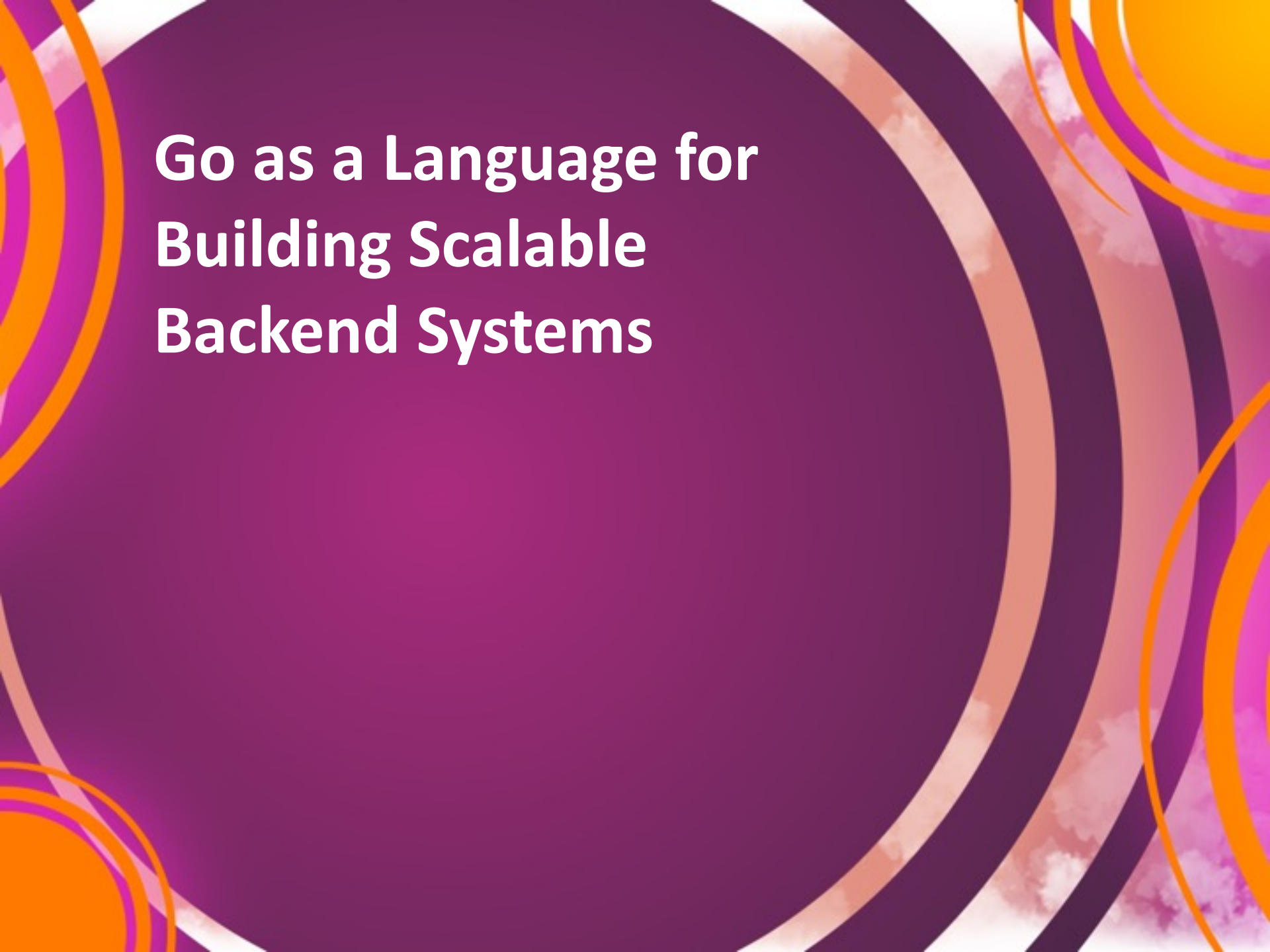
Building Scalable Web Apps and
RESTful Services

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Shiju Varghese

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Agenda

- Introduction to Go
- Go as a language for building scalable backend systems
- Demo - RESTful API with Go

The background features a large, dark purple circle in the center. Surrounding this circle are several overlapping, semi-transparent orange and purple circles of varying sizes. The background also has a subtle, light-colored cloud pattern. The text is white and positioned in the upper left quadrant of the purple circle.

Go as a Language for Building Scalable Backend Systems

Go is an open source programming language that makes it easy to build simple, reliable, and efficient software.

**Go can be described in three words:
Simple, Minimal and Pragmatic.**

Introducing Go

- » Minimalistic language with Pragmatic Design
- » A Static Type Language with High Productivity
- » Concurrency is a Built-in Feature
- » Go Compiles Programs Quickly
- » Go is a General-Purpose Language
- » Go Mobile Project

Go Ecosystem

- » Go language
- » Go libraries
- » Go tooling

Why Go?

- » Concurrency and Communicating Sequential Processes (CSP)
- » Modern C
- » Pragmatism and Developer productivity
- » Go Community
- » Go success stories - Docker, Kubernetes, CoreOS and successful implementations of Microservices
- » Language for the era of Cloud, Microservices and Containers

Building HTTP Servers

The background features a large, dark purple circle in the center. Surrounding this circle are several concentric, semi-transparent rings in shades of orange and purple. The outermost rings are partially cut off by the edges of the frame. In the background, behind the circles, there is a soft, cloudy sky in shades of purple and pink, with a bright yellow sun or moon in the upper right corner.

net/http Package

- » Provides HTTP client and server implementations
- » Allows you to build HTTP servers in Go
- » Provides comparability and extensibility

Processing HTTP Requests

- » ServeMux - HTTP request multiplexer
- » Handler - Serve HTTP requests

http.Handler Interface

```
type Handler interface {  
    ServeHTTP(ResponseWriter, *Request)  
}
```

- » Serve HTTP requests.
- » Handlers are responsible for writing headers and bodies into HTTP responses.

An HTTP Server

```
package main
```

```
import (  
    "fmt"  
    "net/http"  
)
```

```
func hello(w http.ResponseWriter, r *http.Request) {  
    fmt.Fprintf(w, "Hello world!")  
}
```

```
func main() {  
    http.HandleFunc("/", hello)  
    http.ListenAndServe(":8000", nil)  
}
```

HTTP Middleware

- » Pluggable and self-contained piece of code that wraps web application handlers.
- » Components that work as another layer in the request handling cycle, which can execute some logic before or after executing application handlers.
- » Great for implementing cross-cutting concerns: Authentication, authorization, caching, logging etc.


```
func loggingHandler(next http.Handler) http.Handler {
    return http.HandlerFunc(func(w http.ResponseWriter, r *http.Request)
    {
        start := time.Now()
        log.Printf("Started %s %s", r.Method, r.URL.Path)
        next.ServeHTTP(w, r)
        log.Printf("Completed %s in %v", r.URL.Path, time.Since(start))
    })
}
```

// Applying Middleware

```
http.Handle("/", loggingHandler(indexHandler))
```

```
http.Handle("/about", loggingHandler(aboutHandler))
```

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Demo - REST API with Go and MongoDB

Key Takeaways

- » Go is a great stack for building scalable backend systems and Microservices.
- » Go is a great stack for building RESTful APIs.

Thank you!

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