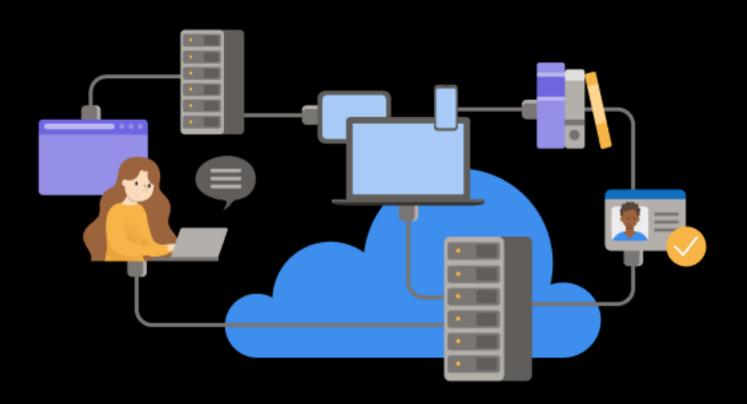


gRPC for WCF Developers



Mark Rendle Miranda Steiner **PUBLISHED BY**

Microsoft Developer Division, .NET, and Visual Studio product teams

A division of Microsoft Corporation

One Microsoft Way

Redmond, Washington 98052-6399

Copyright © 2019 by Microsoft Corporation

All rights reserved. No part of the contents of this book may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

This book is provided "as-is" and expresses the author's views and opinions. The views, opinions and information expressed in this book, including URL and other Internet website references, may change without notice.

Some examples depicted herein are provided for illustration only and are fictitious. No real association or connection is intended or should be inferred.

Microsoft and the trademarks listed at https://www.microsoft.com on the "Trademarks" webpage are trademarks of the Microsoft group of companies.

The Docker whale logo is a registered trademark of Docker, Inc. Used by permission.

All other marks and logos are property of their respective owners.

Author:

Mark Rendle - Chief Technical Officer - Visual Recode

Miranda Steiner - Technical Author

Editors:

John Doe

Introduction

TODO

Purpose

TODO

Who should use this guide

UPDATE THIS

The audience for this guide is WCF developers, development leads, and architects who are interested in migrating WCF solutions on .NET 4 and earlier to ASP.NET Core 3.0 using gRPC services.

How you can use this guide

UPDATE THIS

This is a short introduction to building gRPC Services in ASP.NET Core 3.0 with particular reference to WCF as an analogous platform. It explains the principles of gRPC, relating each concept to the equivalent features of WCF, and offers guidance for migrating an existing WCF application to gRPC. It is also useful for developers who have experience of WCF and are looking to learn gRPC to build new services. The sample application can be used as a template or reference for your own projects, and you are free to copy and reuse code from the book or its samples.

Feel free to forward this guide to your team to help ensure a common understanding of these considerations and opportunities. Having everybody working from a common set of terminology and underlying principles helps ensure consistent application of architectural patterns and practices.

References

- gRPC web site https://grpc.io
- Choosing between .NET Core and .NET Framework for server apps
 https://docs.microsoft.com/dotnet/standard/choosing-core-framework-server

Contents

	ntroduction	. 1
	Distributed applications and microservices	1
	Remote procedure calls	1
	WCF in a nutshell	1
	gRPC in a nutshell	1
9	RPC overview	. 2
	How gRPC approaches RPC	2
	Interface Definition Language	2
	Network protocols	2
	WCF bindings and transports	2
	Why gRPC is recommended for WCF developers	2
F	rotocol Buffers	. 3
	Protobuf messages	3
	Protobuf scalar data types	3
	Protobuf nested types	3
	Repeated fields for lists and arrays	3
	Protobuf reserved fields	3
	Protobuf Any and OneOf fields for variant types	3
	Protobuf enumerations	3
	Protobuf maps for dictionaries	3
C	omparing WCF services to gRPC	. 4
	WCF endpoints and gRPC methods	4
	Types of RPC	4
	Metadata	4
	Error handling	4
N	fligrate a WCF solution to gRPC	. 5
	Create a new ASP.NET Core gRPC project	5
	Migrate a WCF request-reply service to gRPC	5
	Migrate WCF duplex services to gRPC	5
	gRPC streaming services vs repeated fields	5

Create gRPC client libraries	5
gRPC authentication and authorization	6
Call credentials	6
Channel credentials	6
gRPC in production	7
Self-hosted gRPC applications	7
Docker	7
Kubernetes	7
Service meshes	7
Load-balancing	7
Application Performance Management	7
Appendix	8

Introduction

Distributed applications and microservices

Remote procedure calls

WCF in a nutshell

gRPC in a nutshell

gRPC overview

How gRPC approaches RPC

Interface Definition Language

Network protocols

WCF bindings and transports

Why gRPC is recommended for WCF developers

Protocol Buffers

Protobuf messages

Protobuf scalar data types

Protobuf nested types

Repeated fields for lists and arrays

Protobuf reserved fields

Protobuf Any and OneOf fields for variant types

Protobuf enumerations

Protobuf maps for dictionaries

CHAPTER C

Comparing WCF services to gRPC

WCF endpoints and gRPC methods

Types of RPC

Metadata

Error handling

Migrate a WCF solution to gRPC

Create a new ASP.NET Core gRPC project

Migrate a WCF request-reply service to gRPC

Migrate WCF duplex services to gRPC

gRPC streaming services vs repeated fields

Create gRPC client libraries

gRPC authentication and authorization

Call credentials

Channel credentials

gRPC in production

Self-hosted gRPC applications

Docker

Kubernetes

Service meshes

Load-balancing

Application Performance Management

Appendix