

# *gRPC*

**gRPC** (a recursive acronym for **gRPC Remote Procedure Calls**<sup>[2]</sup>) is a [cross-platform](#) open source high performance Remote Procedure Call (RPC) framework. gRPC was initially created by Google, which has used a single general-purpose RPC infrastructure called Stubby to connect the large number of microservices running within and across its data centers for over a decade. In March 2015, Google decided to build the next version of Stubby and make it open source. The result was gRPC, which is now used in many organizations outside of Google to power use cases from microservices to the “last mile” of computing (mobile, web, and Internet of Things). It uses [HTTP/2](#) for transport, [Protocol Buffers](#) as the [interface description language](#), and provides features such as authentication, bidirectional streaming and [flow control](#), blocking or nonblocking bindings, and cancellation and timeouts. It generates cross-platform client and server bindings for many languages. Most common usage scenarios include connecting services in a [microservices](#) style architecture, or connecting mobile device clients to backend services.<sup>[3]</sup>

gRPC	
<b>Developer(s)</b>	Google
<b>Initial release</b>	August 2016
<b>Stable release</b>	1.49.1 <sup>[1]</sup> / September 22, 2022
<b>Repository</b>	<a href="https://github.com/grpc/grpc">github.com/grpc/grpc</a> ( <a href="https://github.com/grpc/grpc">https://github.com/grpc/grpc</a> )
<b>Written in</b>	Android Java, <a href="#">C#</a> , <a href="#">C++</a> , <a href="#">Dart</a> , <a href="#">Go</a> , <a href="#">Java</a> , <a href="#">Kotlin/JVM</a> , <a href="#">Node.js</a> , <a href="#">Objective-C</a> , <a href="#">PHP</a> , <a href="#">Python</a> , <a href="#">Ruby</a>
<b>Type</b>	Remote procedure call framework
<b>License</b>	Apache License 2.0
<b>Website</b>	<a href="https://grpc.io/">grpc.io</a> ( <a href="https://grpc.io/">https://grpc.io/</a> )

gRPC's complex use of HTTP/2 makes it impossible to implement a gRPC client in the browser, instead requiring a proxy.<sup>[4]</sup>

## Authentication

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gRPC supports the usage of [TLS](#) and token-based authentication. Connection to Google services must use TLS. There are two types of credentials: channel credentials and call credentials.<sup>[5]</sup>

## Encoding

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gRPC uses [Protocol Buffers](#) to encode data. Contrary to [REST APIs](#) with [JSON](#), they have a more strict specification. Due to having a single specification, gRPC eliminates debate and saves developer time because gRPC is consistent across platforms and implementations.<sup>[6]</sup>

## Adoption

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A number of different organizations have adopted gRPC, such as [Uber](#),<sup>[7]</sup> [Square](#), [Netflix](#), [IBM](#), [CoreOS](#), [Docker](#), [CockroachDB](#), [Cisco](#), [Juniper Networks](#),<sup>[8]</sup> [Spotify](#),<sup>[9]</sup> [Zalando](#),<sup>[10]</sup> [Dropbox](#),<sup>[11]</sup> and Google as the original developer.

The open source project [u-bmc](#) uses gRPC to replace [IPMI](#).<sup>[12]</sup> On 8 January 2019, [Dropbox](#) announced that the next version of "Courier", their RPC framework at the core of their [service-oriented architecture](#) (SOA), would be migrated to be based on gRPC, primarily because it aligned well with their existing custom RPC frameworks.<sup>[13]</sup>

## See also

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- [Protocol Buffers](#)
- [Apache Thrift](#)
- [Apache Avro](#)
- [JSON-RPC](#)
- [XML-RPC](#)

## References

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## External links

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- [gRPC Home Page \(https://grpc.io/\)](https://grpc.io/)
- [gRPC – github.com \(https://github.com/grpc/\)](https://github.com/grpc/)
- [gRPC – opensource.google.com \(https://opensource.google.com/projects/grpc\)](https://opensource.google.com/projects/grpc)



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