SOAP vs REST vs GraphQL vs RPC
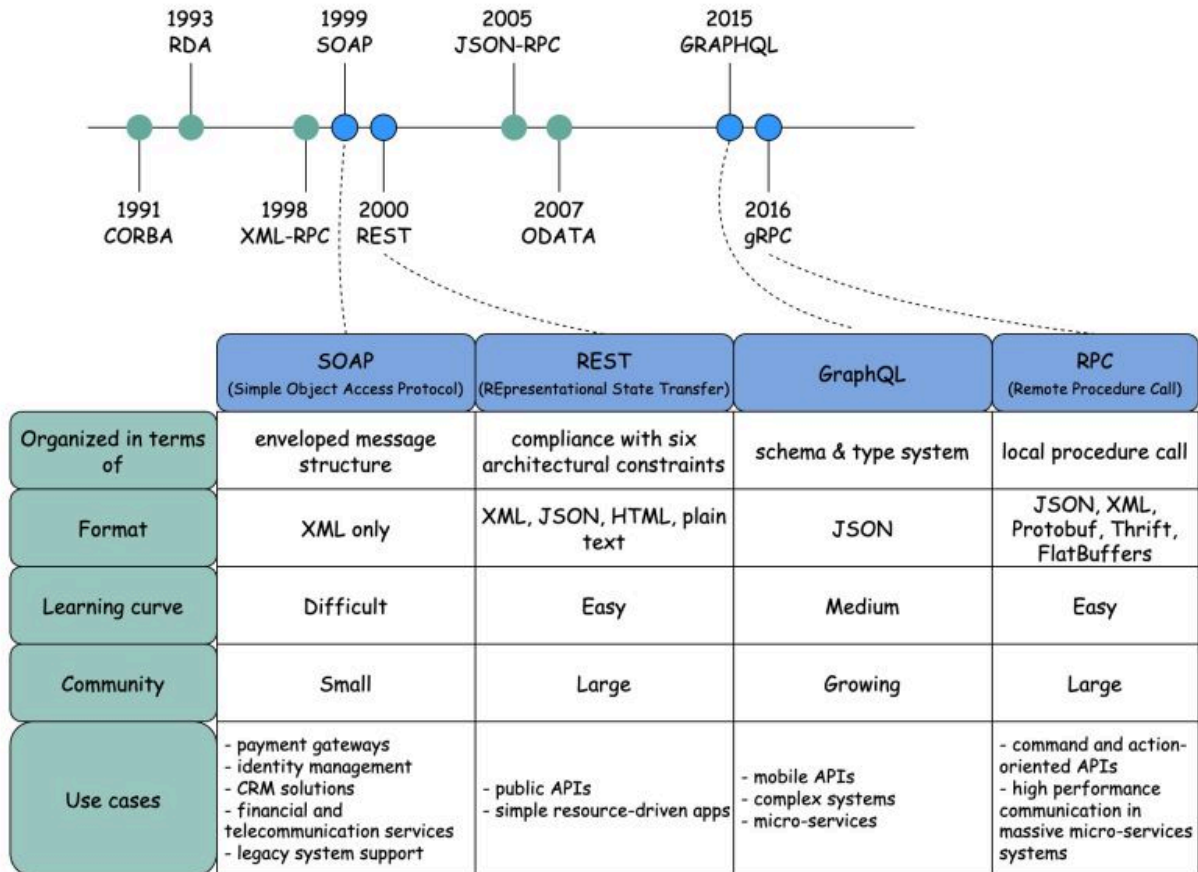
The diagram below illustrates the API timeline and API styles comparison.

API Architectural Styles Comparison

Timeline:

- 1991 CORBA
- 1993 RDA
- 1998 XML-RPC
- 1999 SOAP
- 2000 REST
- 2005 JSON-RPC
- 2007 ODATA
- 2015 GRAPHQL
- 2016 gRPC

	SOAP (Simple Object Access Protocol)	REST (REpresentational State Transfer)	GraphQL	RPC (Remote Procedure Call)
Organized in terms of	enveloped message structure	compliance with six architectural constraints	schema & type system	local procedure call
Format	XML only	XML, JSON, HTML, plain text	JSON	JSON, XML, Protobuf, Thrift, FlatBuffers
Learning curve	Difficult	Easy	Medium	Easy
Community	Small	Large	Growing	Large
Use cases	- payment gateways - identity management - CRM solutions - financial and telecommunication services - legacy system support	- public APIs - simple resource-driven apps	- mobile APIs - complex systems - micro-services	- command and action-oriented APIs - high performance communication in massive micro-services systems

Over time, different API architectural styles are released. Each of them has its own patterns of standardizing data exchange.

You can check out the use cases of each style in the diagram.