REST vs GraphQL vs gRPC

DevNexus 2025

Key Expectations & Takeaways

- 300-Level review of API services including REST, GraphQL, & gRPC
- Review current active customer stories
- Gain fun & impactful perspectives from the partner field

Defining the Frontier for Integration

REST vs. GraphQL vs. gRPC

The standard for data exchange between frontend, backend, and integrations has always been a bit contentious.

With different API technologies available for sharing data between clients and servers, and each one having its own set of unique capabilities, it can be quite daunting trying to decide which one serves you best.

The three most popular technologies currently for creating APIs are ***REST, GraphQL, and gRPC***. Let's review this frontier..

Insight.

Key Comparisons

Feature	REST	GraphQL	gRPC
Protocol	HTTP 1.1	HTTP 1.1	HTTP/2
Data Format	JSON, XML	JSON	Binary (Protobuf)
Flexibility	Fixed Endpoints	Dynamic Queries	Strongly Typed
Performance	Can Over-Fetch	Efficient	High Efficiency
Streaming	No	No	Yes (Bi-directional)
Best Use Case	Web APIs	Dynamic Queries	Microservices, Mobile

Which One to Use?

- Use **REST** for simple, cacheable, and stateless APIs.
- Use **GraphQL** for flexible, efficient data retrieval in client-driven applications.
- Use **gRPC** for high-performance, low-latency microservices or real-time communication.

DEMO data set

Our Data Model

Starships

Many - to - Many

Films

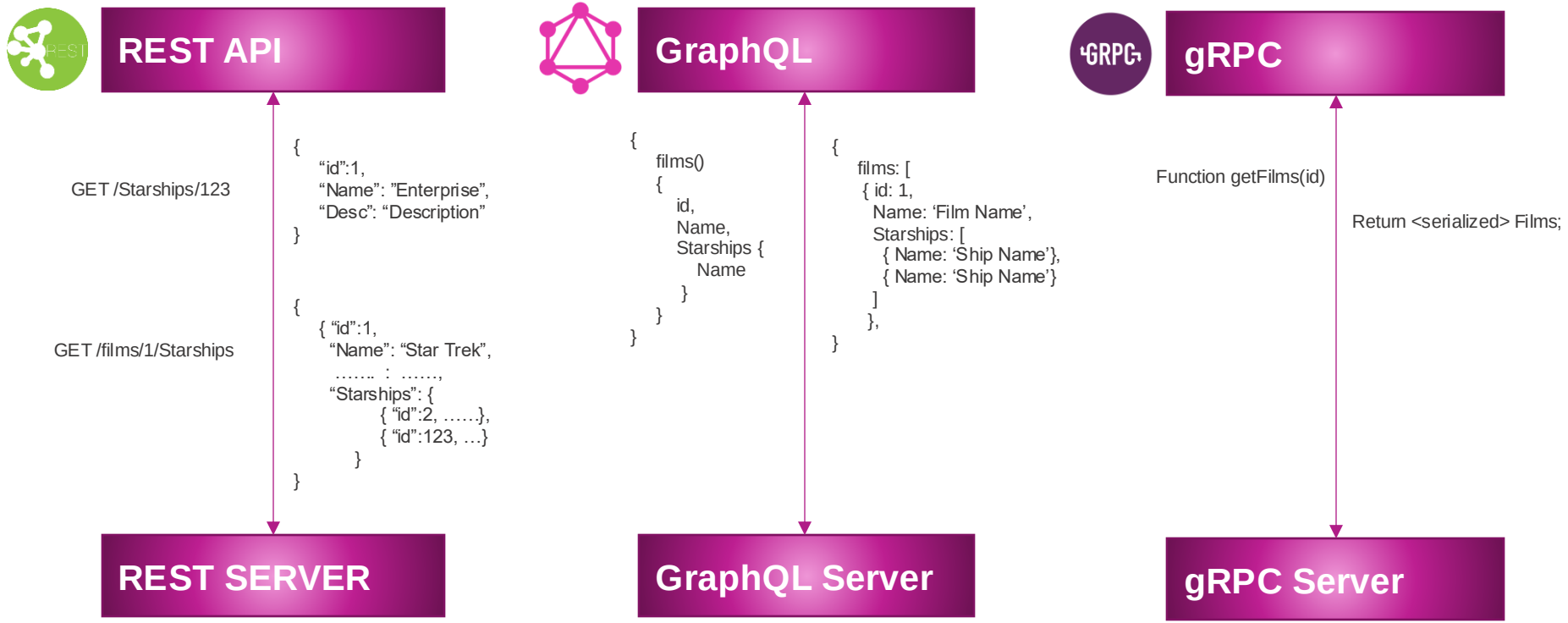
STAR WARS

STAR TREK

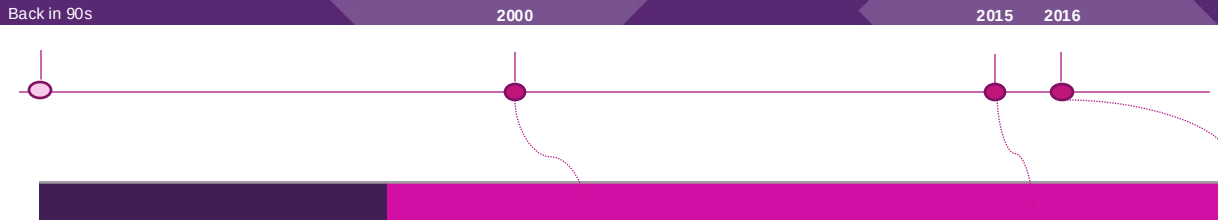
Many - to - Many

Producers

Main Differences



Usage Comparison



	REST (Representational State Transfer)	GraphQL	gRPC (Remote Procedure Call)
Format	XML, JSON, HTML, plain text	JSON	JSON, XML, Protobuf
Learning Curve	Easy	Medium	Easy
Community	Large Scale Adoption	Growing/Adoption	Growing
Use Cases	-Public APIs -Private transactional -Identity Mgmt -Legacy system int/support -Simple Resource Driven Apps	-Mobile APIs -Complex Systems -Micro-frontends -Multi-Tenant -Microservices	-Command & Action Oriented Apps -High Performance -Communication in massive microservice systems -Disconnected Systems – Mobile, IoT

Demo

Let's get into the code….

Client Stories

Success from the field

Large scale distribution

Automated Material Handling Systems, Equipment, & Consulting company

The client is on a unique journey to build the next generation warehouse execution system.

- Design "Waze for the warehouse" in the public cloud
- Completely automating never been done before
- An Industrial IoT Solution (Sorting, Picking, Conveyers, etc.)
- Client is taking a 'Basecamp to the summit' approach
- Designed with Microservices and Functions
  - *REST APIs*
  - *GraphQL*

Now, we're engaged on a multi-year opportunity to build project "Jinan" which means "second son"

Global Retail Coffee Manufacture

Next Generation POS and Order Operations

The client is on a unique journey to build the next generation POS and Ordering System

- 33k locations; Security & Offline operations key
- Enhance barista partner and client experience
- Limited capability to allow exposed endpoints
- Integration leveraging gRPC to reduce exposure and increase performance
- Serviced based integration leveraging gRPC

Now, we're engaged on opportunities to increase Drive Thru experiences

/questions

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