Building a Scalable Multi-Protocol API Gateway with Envoy

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Introductions

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The Product

The Requirements

✅ **High availability and reliability**
✅ **E2E encryption**
✅ **Support long-lived connections**
✅ **Integrate with existing observability solutions**
✅ **Allow custom authentication and authorization**
✅ **Support proxy protocol**
🤔 **Dynamic connection routing**

The Protocols

- ❏ IBM MQ
- ❏ FIX
- ❏ SFTP

Building an Enterprise Connectivity Platform on Envoy - IBM MQ

What is it?

How can Envoy proxy it?

- A universal messaging backbone with robust connectivity for flexible and reliable messaging
- Made up of one or more queue managers
- A network of connected queue managers supports asynchronous routing of messages between systems
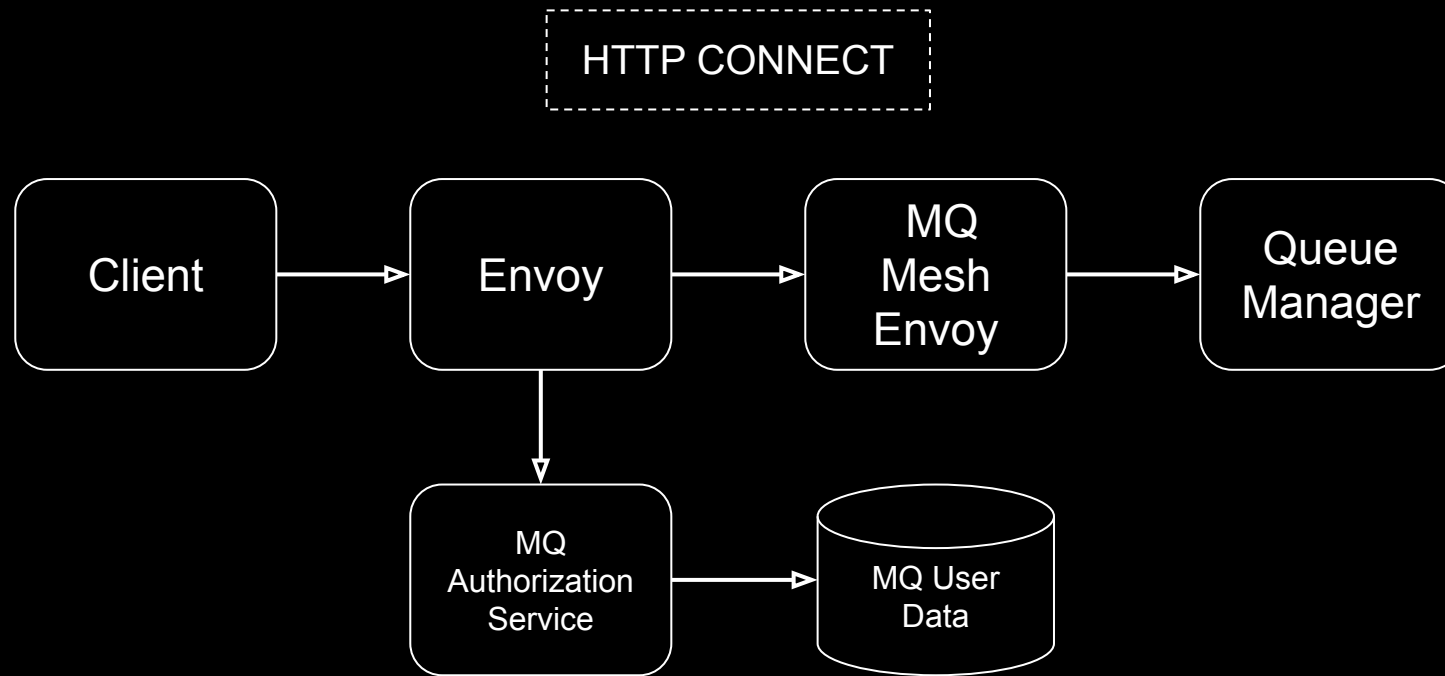
- TLS inspector filter
- External authorization filter
- New HTTP tunnel filter
- TCP Proxy filter

New HTTP Tunnel Filter

Goal: Dynamically route connections based on connection attributes and external services

Building an Enterprise Connectivity Platform on Envoy - FIX

What is it?

- Financial Information Exchange protocol, built on TCP
- Non-proprietary, free and open standard used to communicate trade information
- Long lived connections, complex routing topology, active-passive servers

How can Envoy proxy it?

- TLS inspector filter
- External authorization filter
- New HTTP tunnel filter
- TCP Proxy filter

Source: https://www.fixtrading.org/what-is-fix/

Building an Enterprise Connectivity Platform on Envoy - SFTP

What is it?

- Secure File Transfer Protocol, built on SSH
- Non-proprietary, free and open standard used to upload and download files

How can Envoy proxy it?

- New SSH transport
- New HTTP tunnel filter
- TCP Proxy filter

Building an Enterprise Connectivity Platform on Envoy - Security

- End-to-end mTLS using SPIRE from edge to service mesh

- Integration with internal IAM policy engine with an additional external authorization service

- Consistent policies across endpoints

Building an Enterprise Connectivity Platform on Envoy - Monitoring

- Logs $\Longrightarrow$ Access and application loggers

- Metrics $\Longrightarrow$ Statsd exporter

- Traces $\Longrightarrow$ OpenTelemetry exporter

- Events $\Longrightarrow$ Assorted gRPC services

Key Takeaways

1. Envoy's extensive configuration options and open-for-extension design allows it to be adaptable for a variety of protocols

2. Envoy's attention to security, integration with SPIRE, and support for proxy protocol makes it an easy sell to your network admins

3. Envoy's support for many observability sources and formats allows for robust monitoring from day one

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Thank you!

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