RUST CHINA CONF 2020

首届中国 Rust 开发者大会

2020.12.26–27 深圳

Rust China Conf 2020

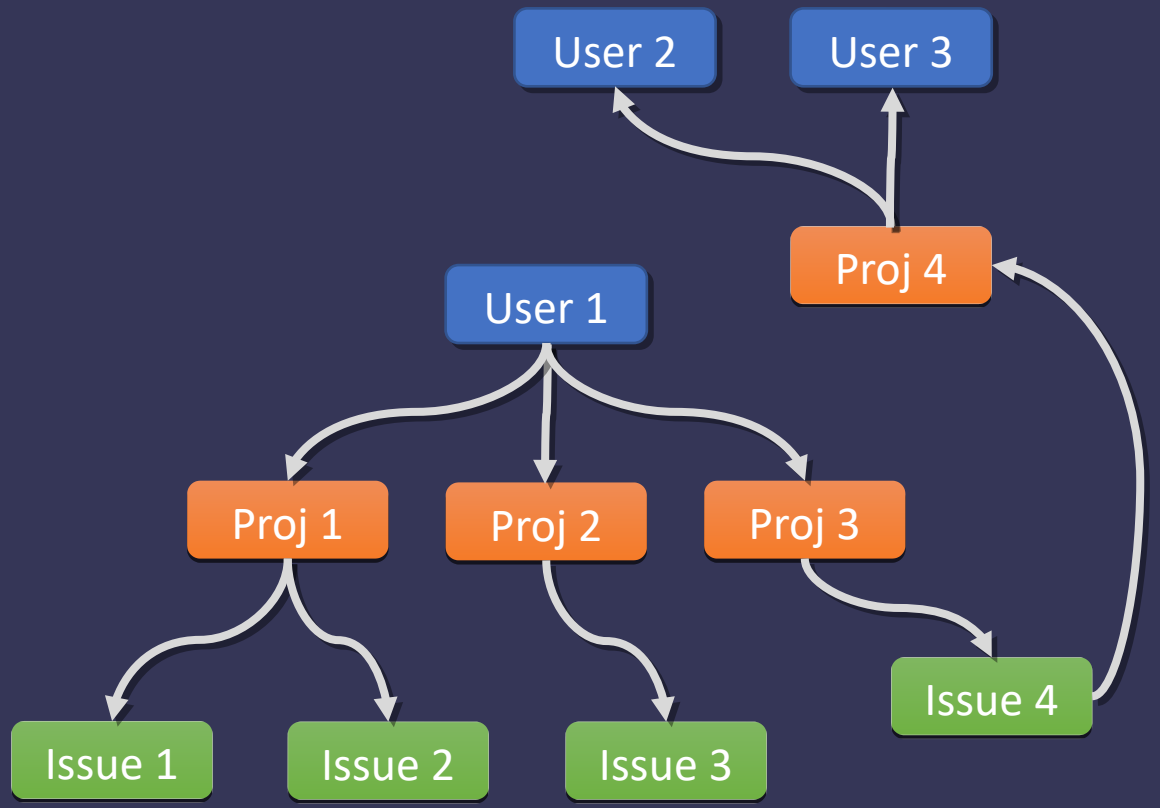
Shenzhen, China

2020conf.rustcc.cn

Async-graphql
Rust 语言实现的异步 GraphQL 服务端库

孙黎（老油条）

GraphQL 是什么




```
user(id: 1) {
    projects {
        issues {
            projects {
                users {
                    ...
                }
            }
        }
    }
}
```

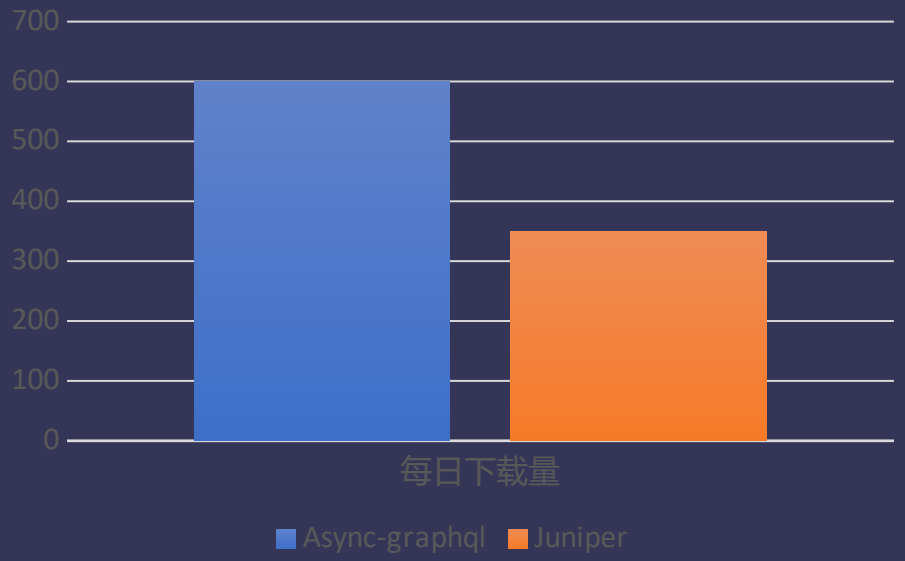
发起开源项目 Async-graphql 的原因

- 完全支持 Async
- 完全符合 GraphQL 规范
- 类型安全，高性能
- 无 DSL，对 Rustfmt 友好
- 支持 Appollo Federation 实现基于 GraphQL 的微服务

Async-graphql 现状

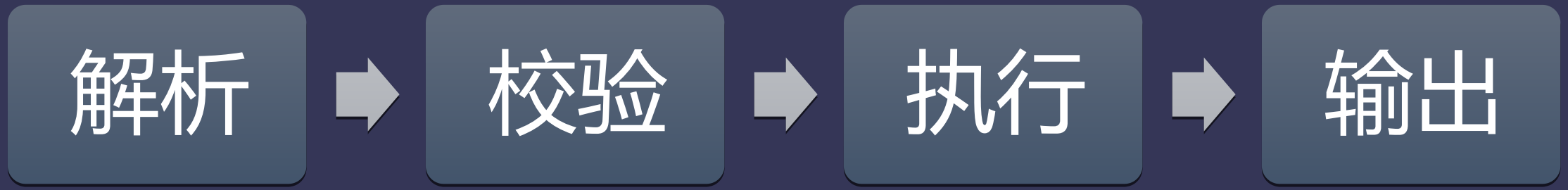
Stargazers: 1.1k
Contributors: 44
Issues: 229 closed
PR: 112

每日下载量（ crates.io ）



Async-graphql 的实现

执行一个查询的步骤



核心 Trait

Type

- 表示一个 GraphQL 类型，提供 create_type_info 函数在类型注册表中创建该类型的信息。

InputType

- 表示一个输入值类型，提供 parse 函数解析输入值。

OutputType

- 表示一个输出值类型，提供 resolve 函数根据客户端的查询输出结果。

定义 Schema

```
type User {
  name: String,
  email: String,
}

type Query {
  user(id: Int): User,
}

schema {
  query: Query
}
```

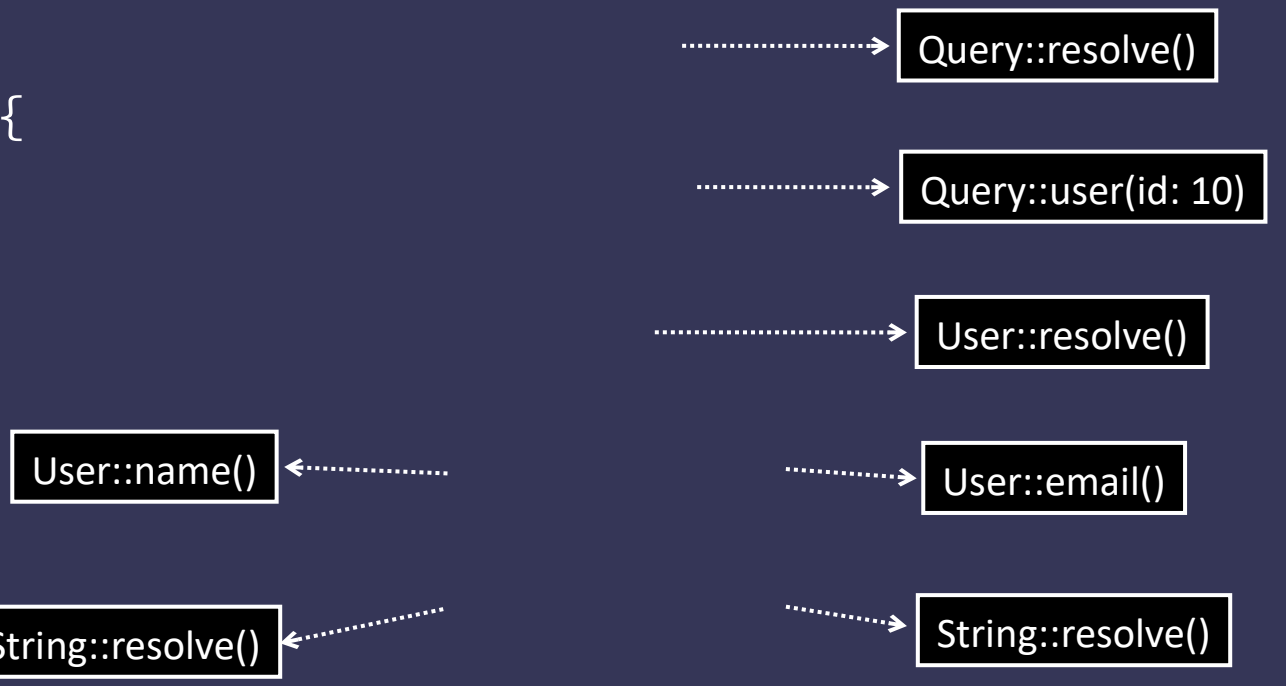
```
#[derive(SimpleObject)]
struct User {
    name: String,
    email: String,
}

struct Query;

#[Object]
impl Query {
    async fn user(&self, id: u64) -> Result<User> {
        //  从数据库中加载指定 id 的 User
    }
}
```

执行阶段

```
{
    user(id: 10) {
        name
        email
    }
}
```



Type 类型

```rust
trait Type {
    fn type_name() -> String;

    fn create_type_info(registry: &mut registry::Registry) -> String;
}
```

Rust 类型	GraphQL 类型	Rust 类型	GraphQL 类型
i32	Int!	Option<i32>	Int
Vec<i32>	[Int!]!	Option<Vec<i32>>	[Int!]
Vec<Option<i32>>	[Int]!	Option<Vec<Option<i32>>>	[Int]

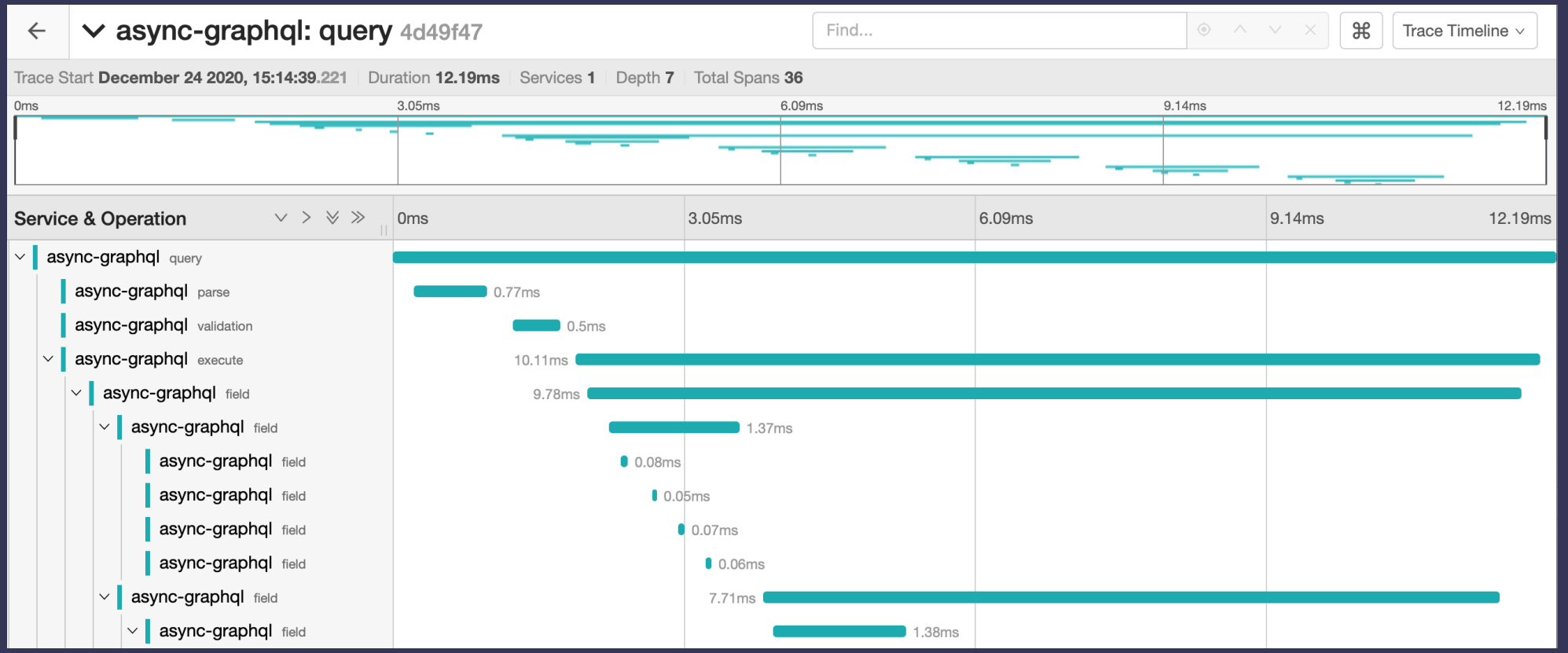
InputType 和 OutputType 类型

```rust
trait InputType: Type + Sized {
    fn parse(value: Option<Value>) -> InputValueResult<Self>;
}


trait OutputType: Type {
    async fn resolve(&self, ctx: &Context) -> ServerResult<Value>;
}
```

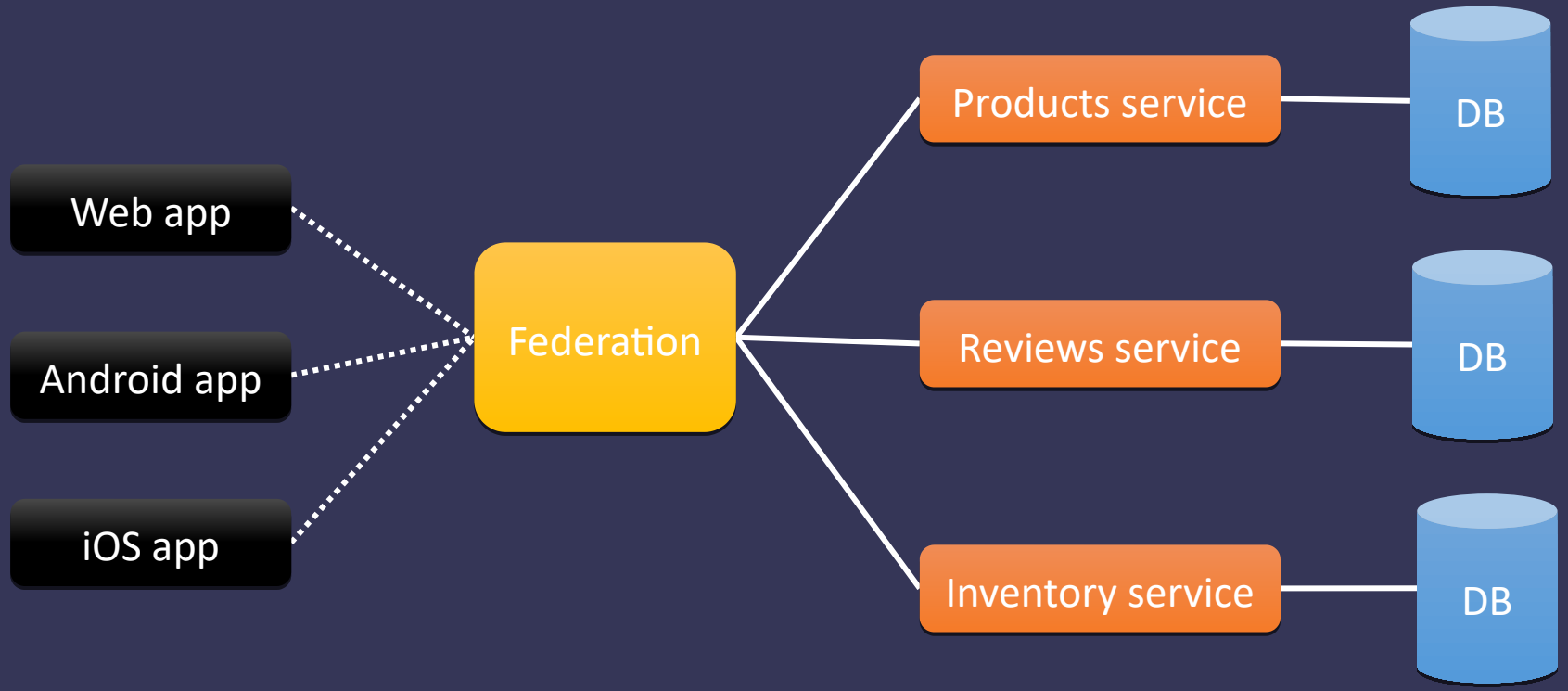
Tracing

使用 Tracing 库来跟踪 GQL 查询各个阶段的执行情况



Apollo Federation

使用 Federation 网关来实现基于 GraphQL 的微服务



用 Darling 简化过程宏的编写

```rust
#[derive(FromDeriveInput)]
#[darling(attributes(graphql), forward_attrs(doc))]
pub struct Enum {
    pub ident: Ident,
    pub generics: Generics,
    pub attrs: Vec<Attribute>,
    pub data: Data<EnumItem, Ignored>,

    #[darling(default)]
    pub internal: bool,
    #[darling(default)]
    pub name: Option<String>,
    #[darling(default)]
    pub rename_items: Option<RenameRule>,
    #[darling(default)]
    pub remote: Option<String>,
}
```

https://github.com/async-graphql/async-graphql

谢谢大家

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