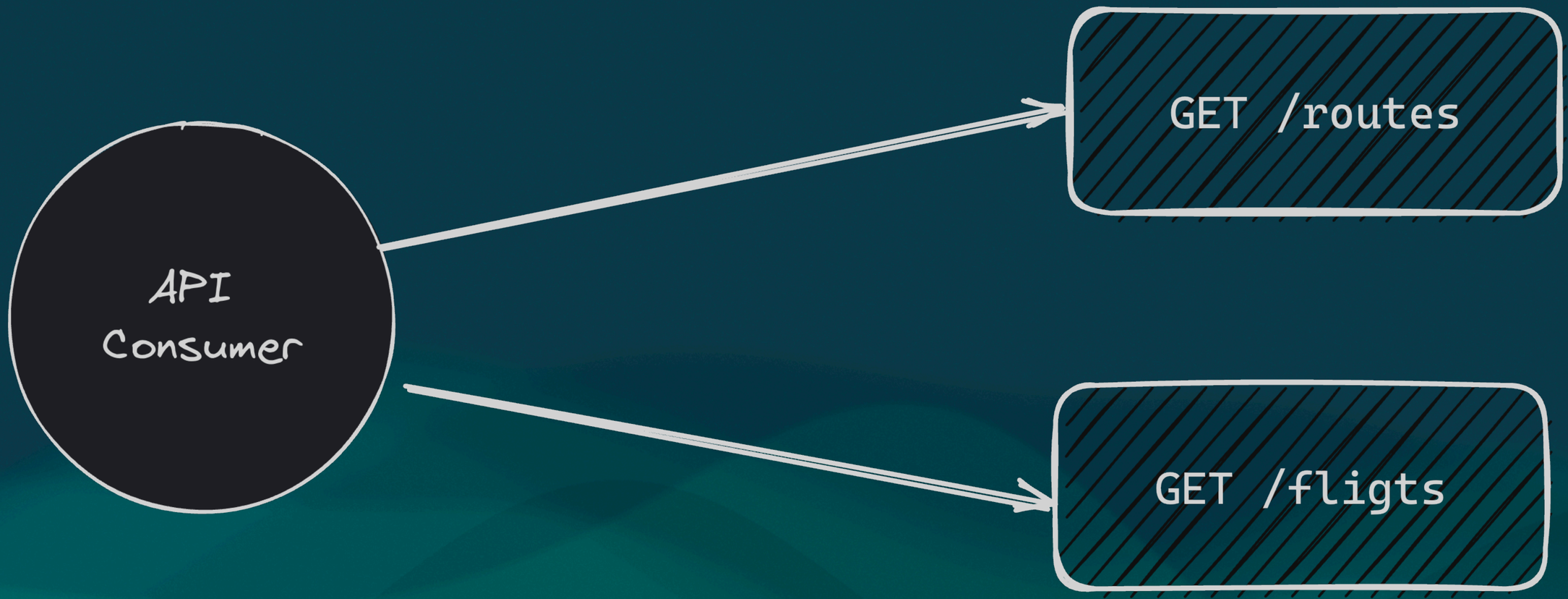
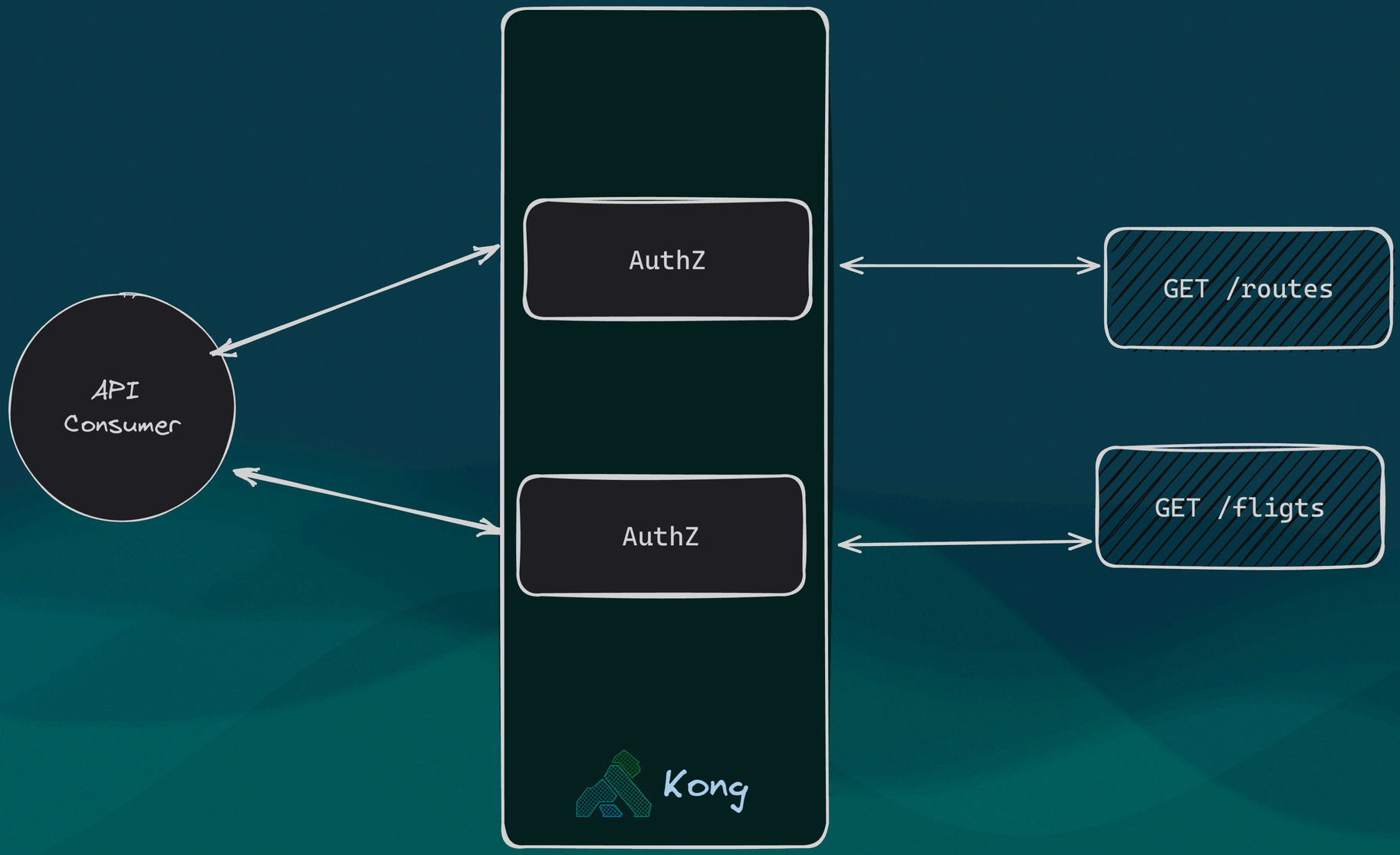
Guarding GraphQL
Strategies for Robust API Authorization

Viktor Gamov, October 24th, Santa Clara, California

X: @gamussa @thekonginc


API
Consumer
GET /routes
GET /fligts

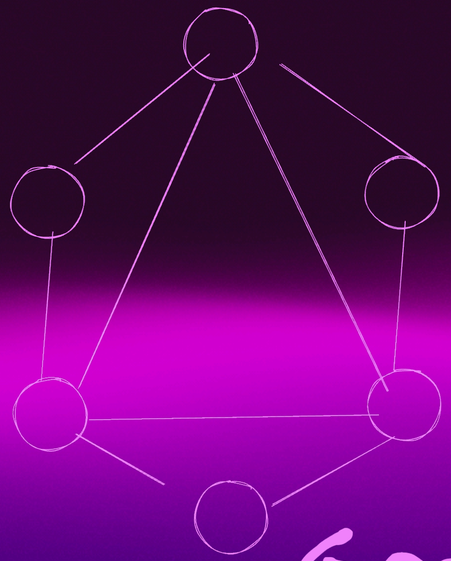
API Gateway



API Consumer Query

```
query {
  flights(date: "2024-03-20") {
    number
    route {
      origin
      destination
    }
    scheduled_departure
  }
}
```

KongAir GraphQL



GraphQL

AuthZ

nested
conditional data

API Consumer Query

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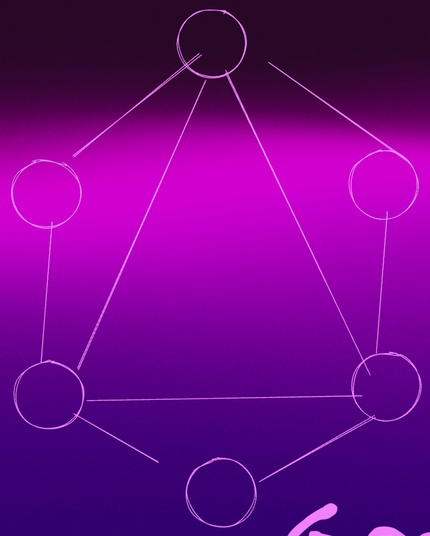
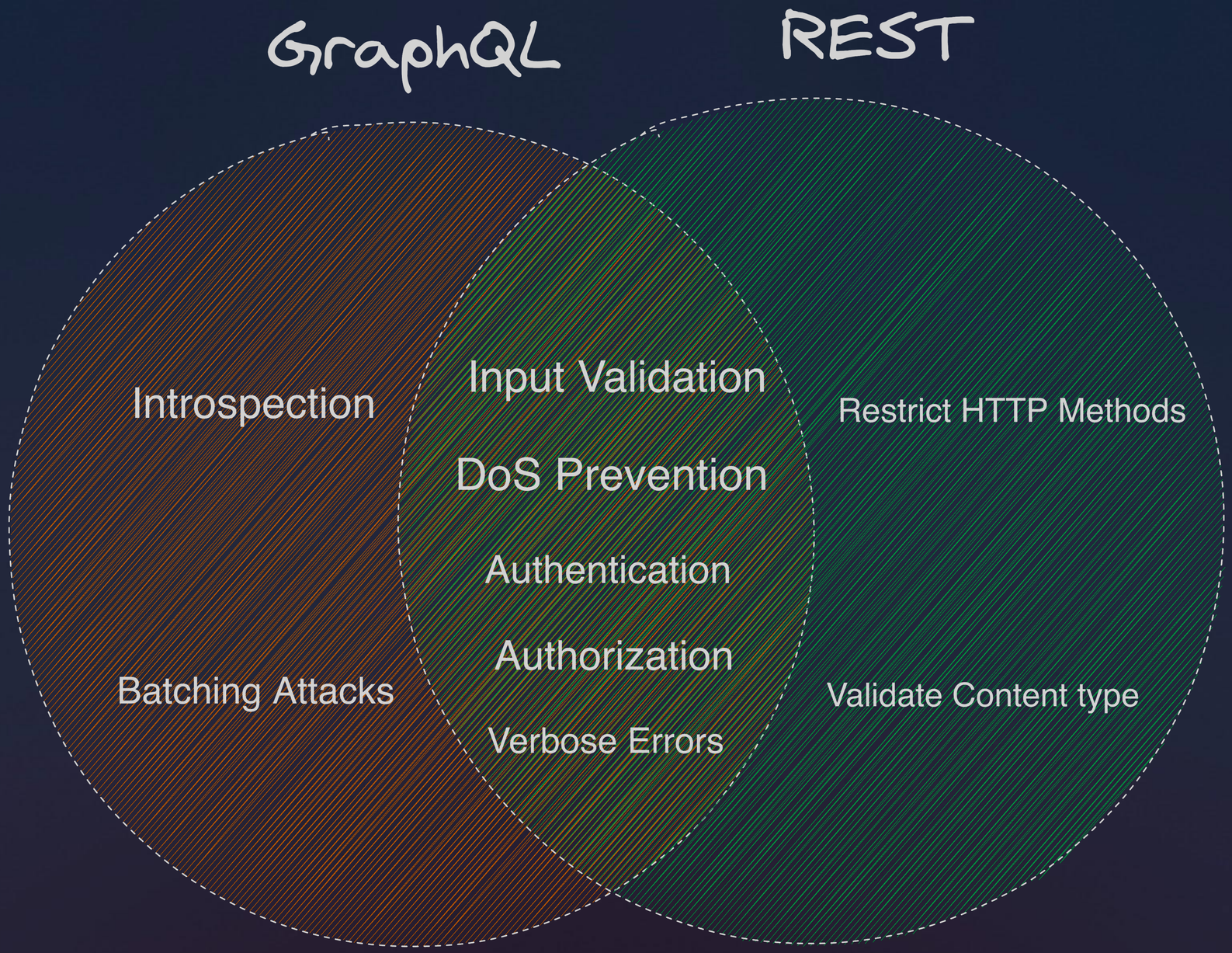


GraphQL


GraphQL
REST
Introspection
Input Validation
Restrict HTTP Methods
DoS Prevention
Authentication
Authorization
Batching Attacks
Validate Content type
Verbose Errors

Viktor

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Danny

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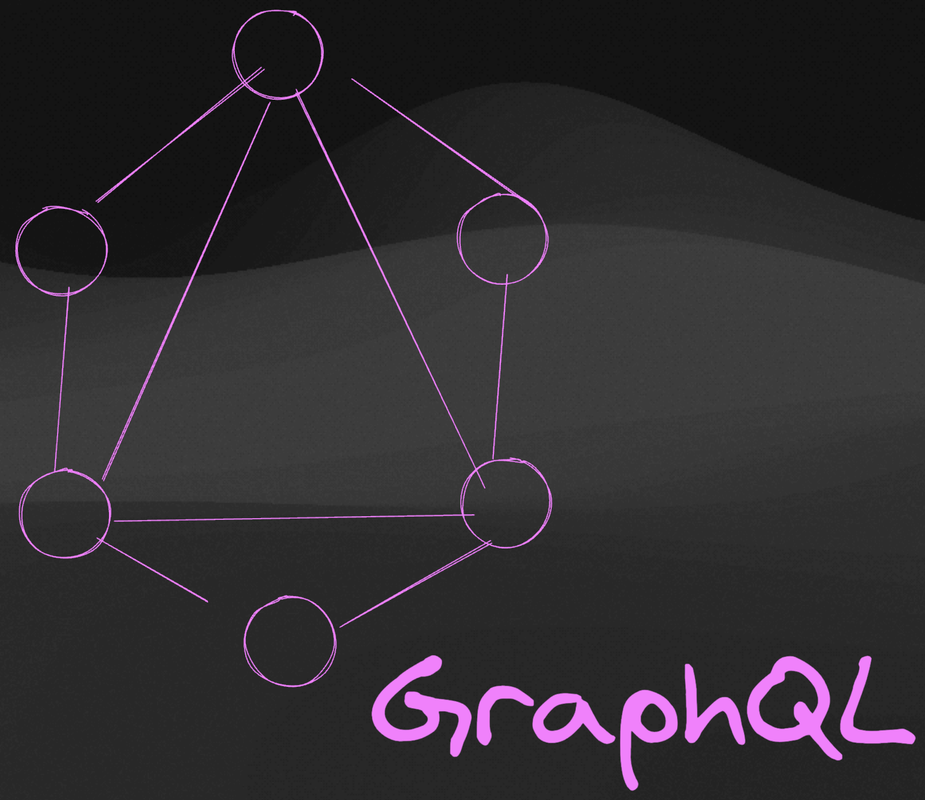
Agenda

- Start from the beginning - REST or GraphQL
- Why is Authorization with GraphQL Hard to Tackle?
  - REST example
  - GraphQL example
- Tackling AuthZ with API Gateway

GraphQL

Nuts and Bolts

- Schema
- Queries
- Mutations
- Subscriptions



Schema

Define your API

```
type Route {
    origin: String!
    destination: String!
}

type Flight {
    number: String!
    route: Route!
    scheduled_departure: String!
    scheduled_arrival: String!
}

type Booking {
    ticket_number: String!
    flight: Flight!
    seat: String!
}
```

Queries

Get what you need

```
type Query {
    routes(origin: [String!]): [Route!]!
    flights(date: String!): [Flight!]!
    bookings(customer_id: ID!): [Booking!]!
}
```

Queries

Get what you need

```
type Query {
    routes(origin: [String!]): [Route!]!
    flights(date: String!): [Flight!]!
    bookings(customer_id: ID!): [Booking!]!
}
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        route {
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            destination
        }
        scheduled_departure
    }
}
```

Mutations

Modify data

```
input BookingInput {
…
}

input CustomerInformationInput {
…
}

type Mutation {
    bookFlight(
        booking: BookingInput!
        customerInformation:
CustomerInformationInput
    ): BookingResponse!
}
```

Mutations

Modify data

```
input BookingInput {
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}

input CustomerInformationInput {
…
}

type Mutation {
    bookFlight(
        booking: BookingInput!
        customerInformation:
CustomerInformationInput
    ): BookingResponse!
}
```

```
mutation {
    bookFlight(
        booking: {
            flight_number: "KA924"
            seat: "32A"
        }
        customerInformation {
            frequentFlierNumber: "ABC123"
        }
    )
    {
        ticket_number
    }
}
```

Subscription

Real-time updates

```
type Subscription {
    newFlight: Flight!
}
```

Subscription

Real-time updates

```
type Subscription {
    newFlight: Flight!
}
```

```
subscription {
    newFlight {
        number
        route {
            origin
            destination
        }
        scheduled_departure
        scheduled_arrival
    }
}
```

Why is Authorization with GraphQL Hard to Tackle?

API Consumer Query

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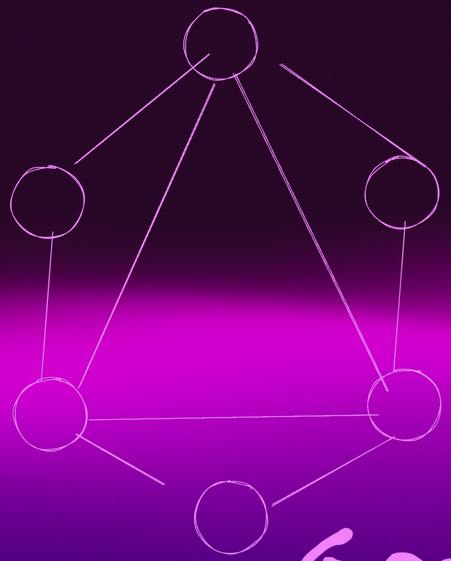
KongAir GraphQL



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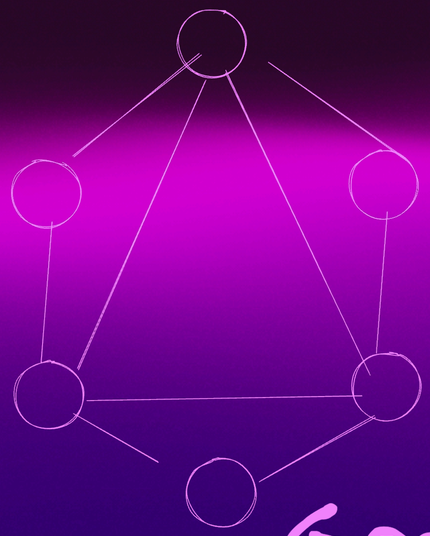
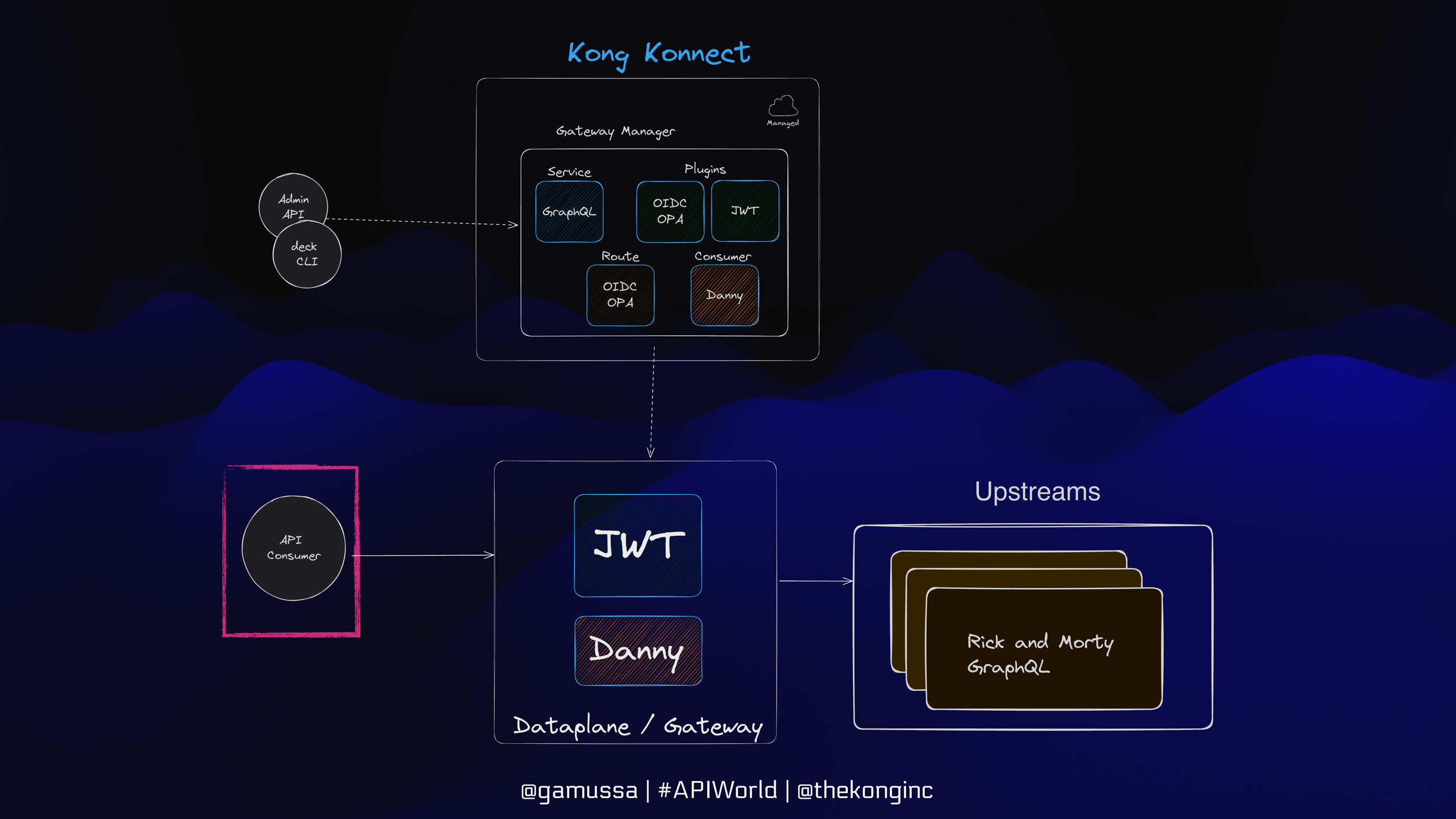
KongAir GraphQL



GraphQL

Protect Endpoints with JWT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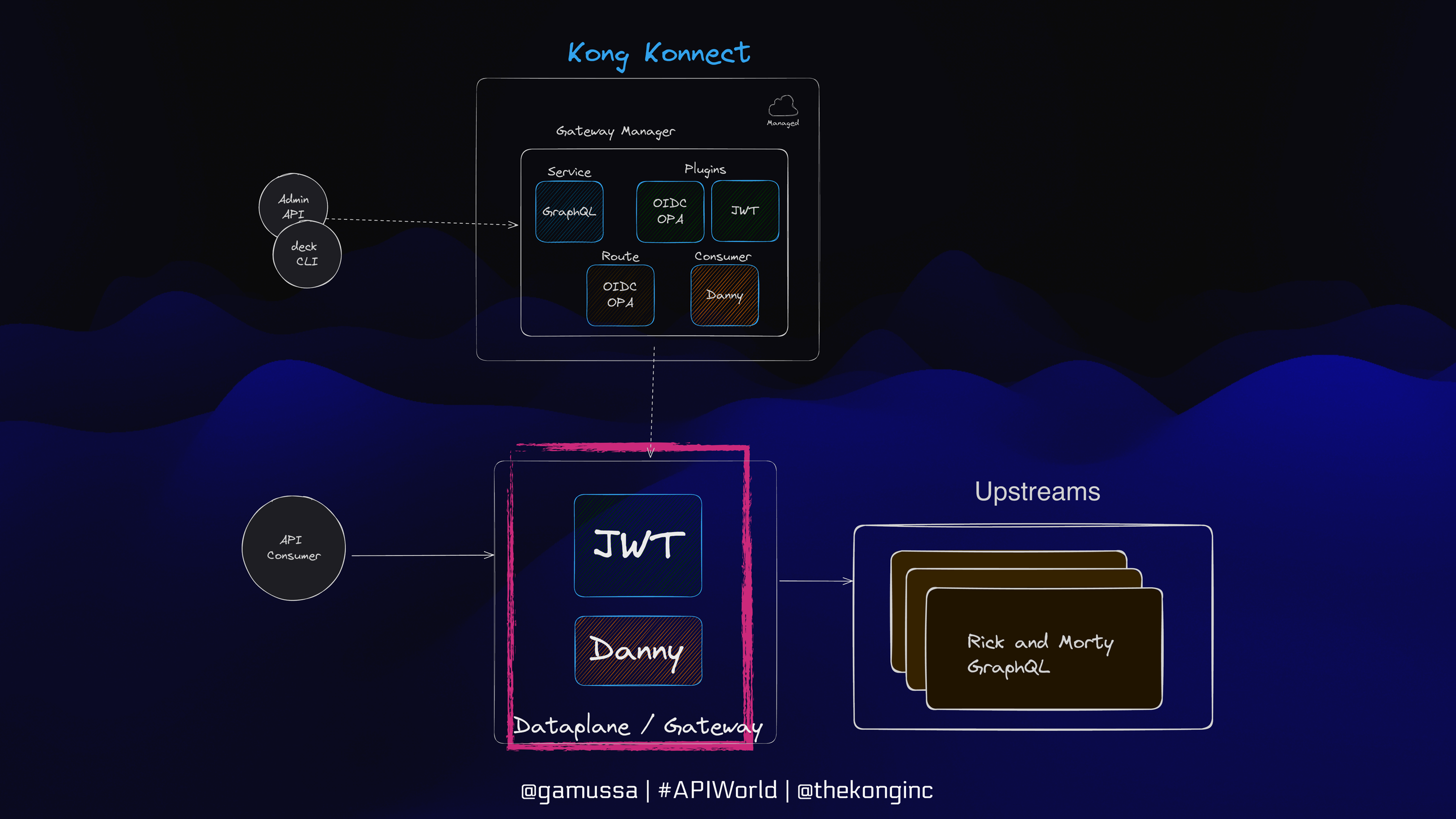
Dataplane / Gateway
Upstreams
Rick and Morty
GraphQL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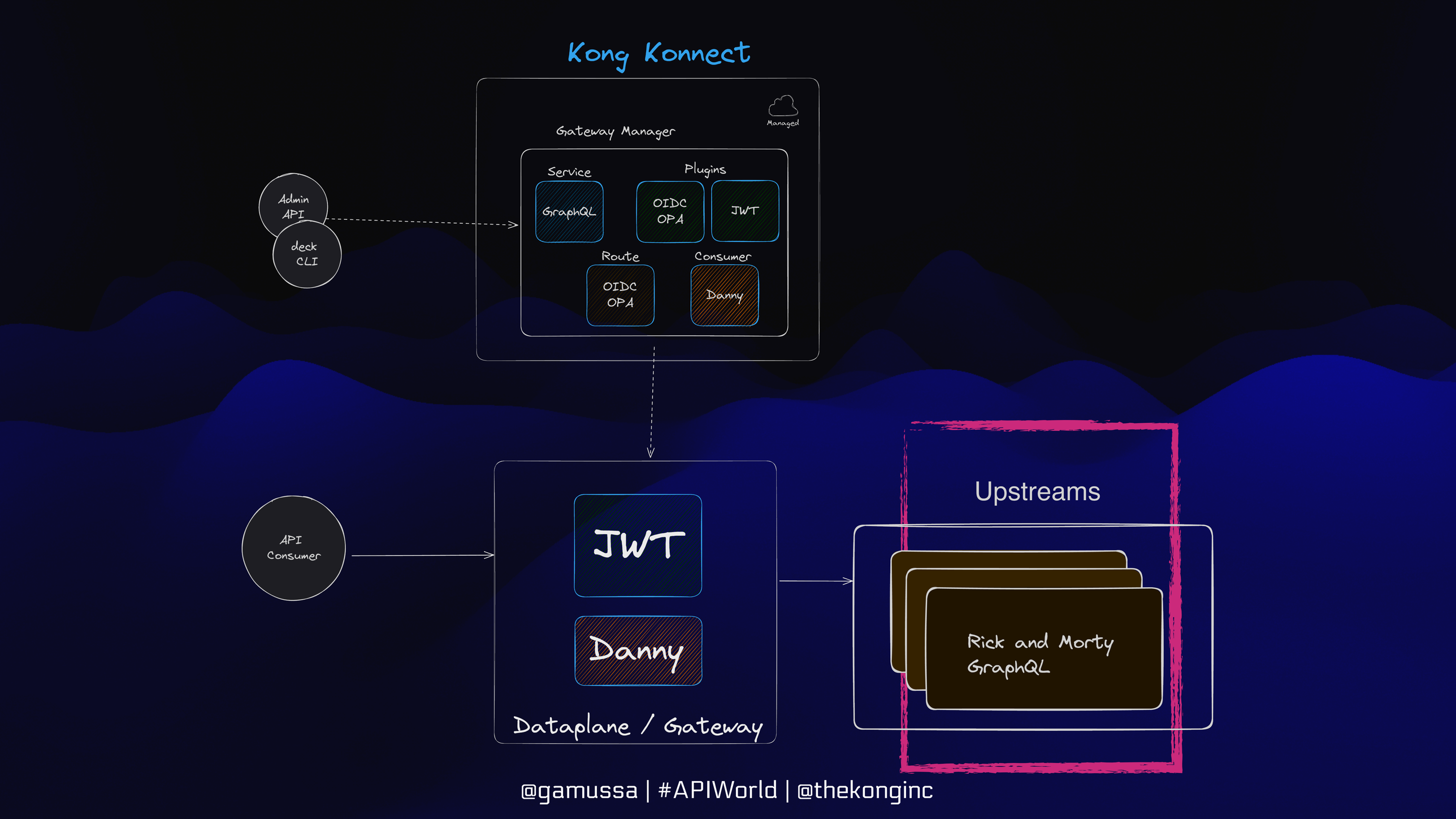
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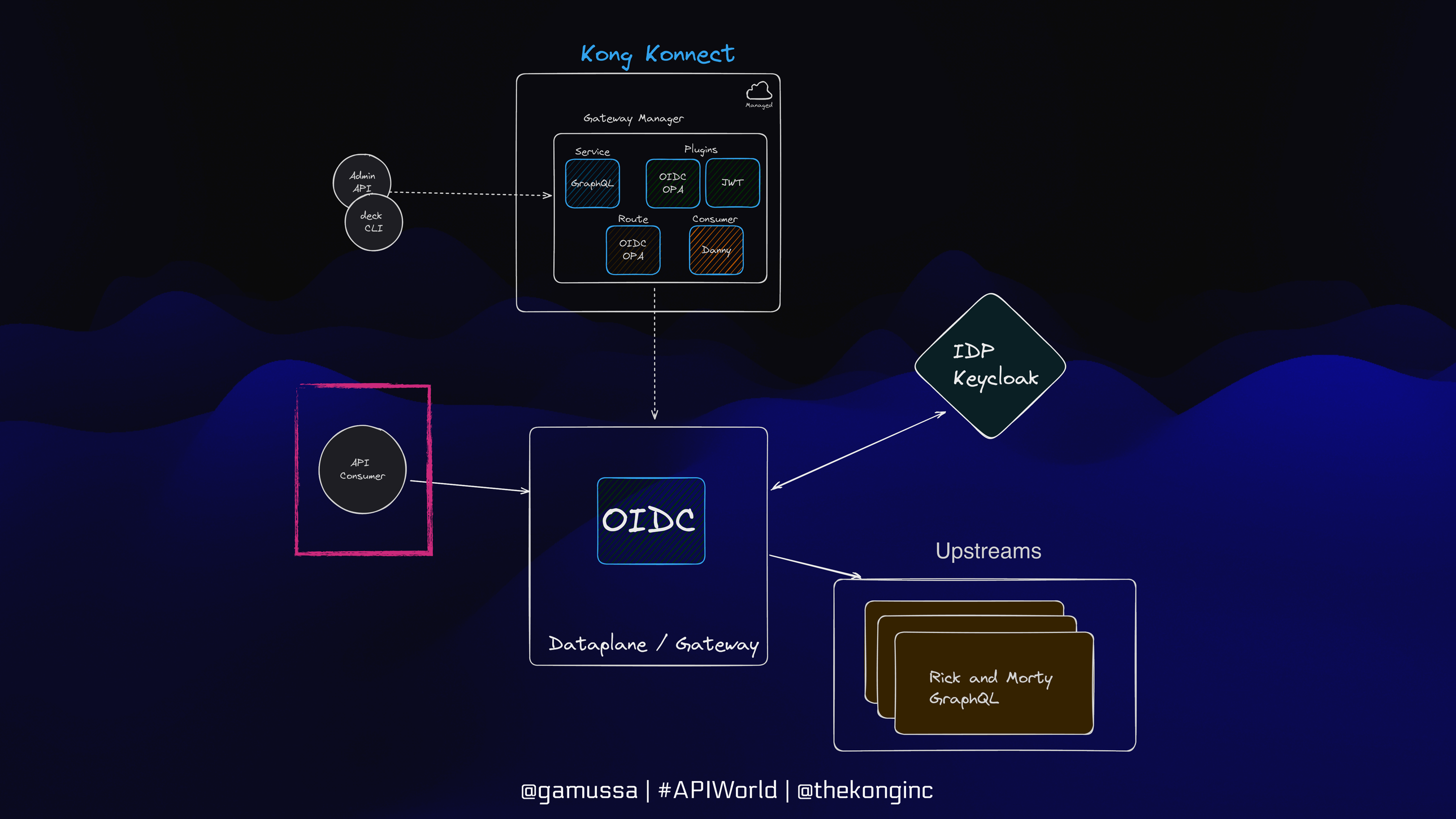
GraphQL

DEMO

Integrate with IDP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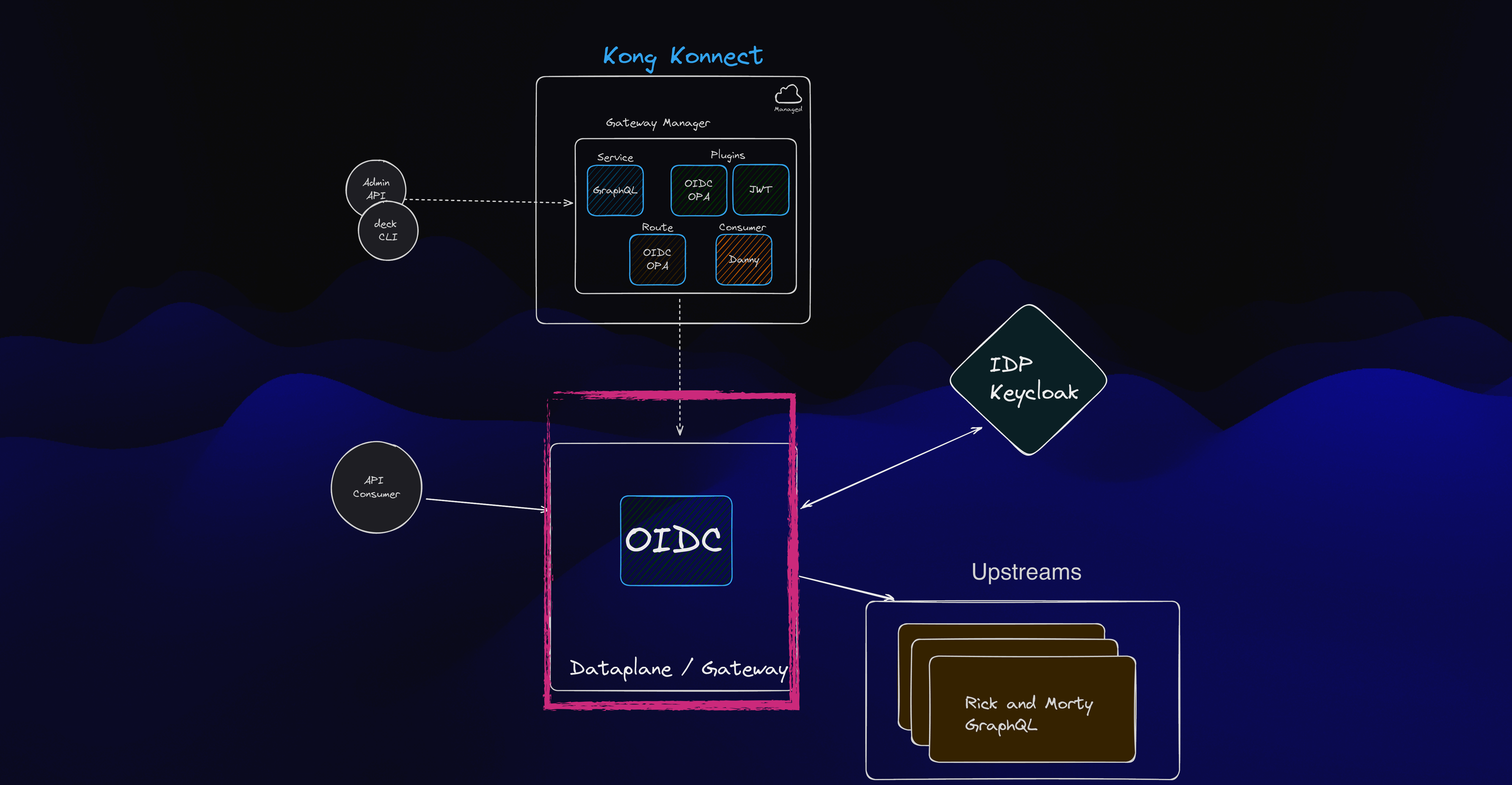
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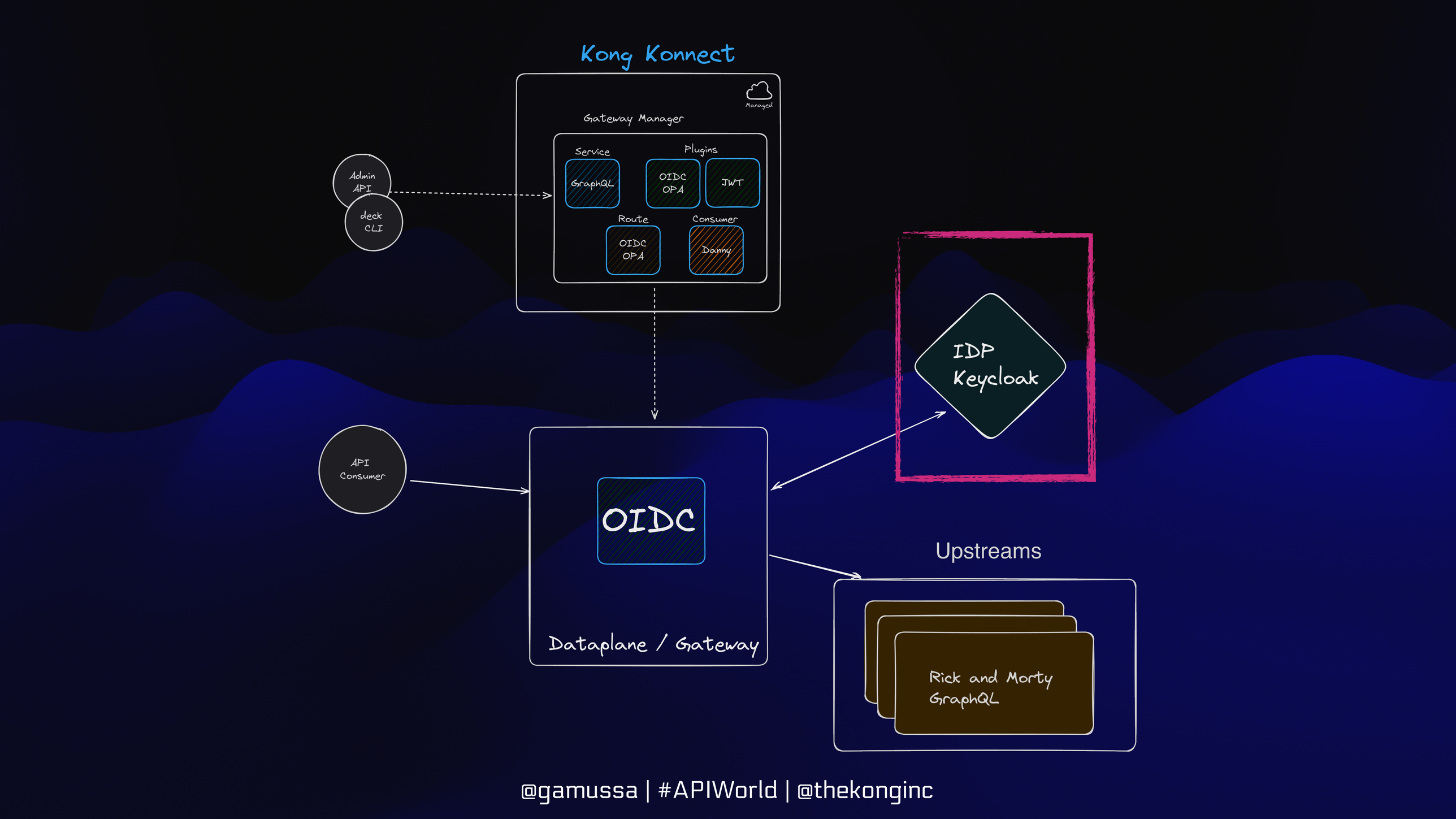
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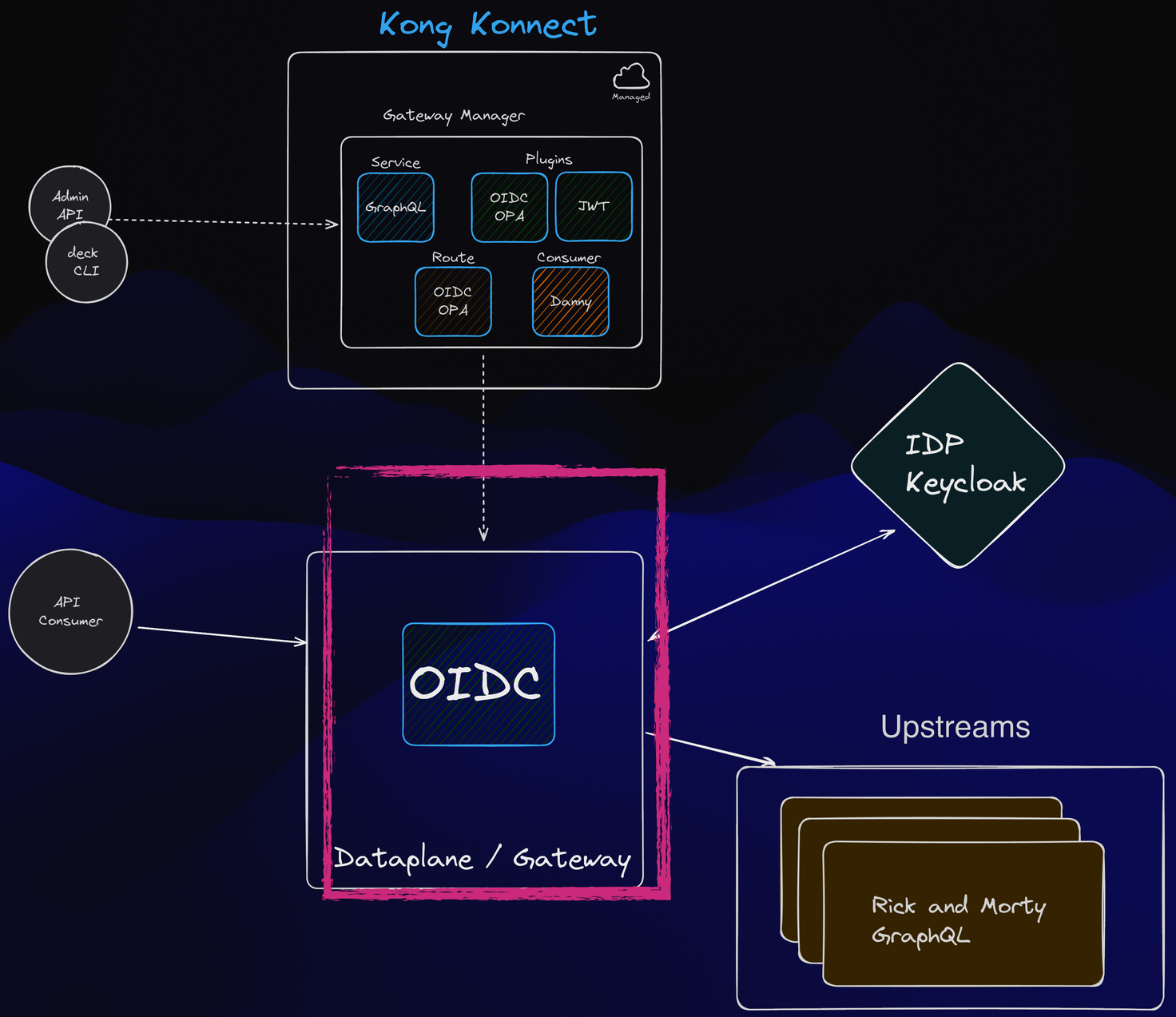
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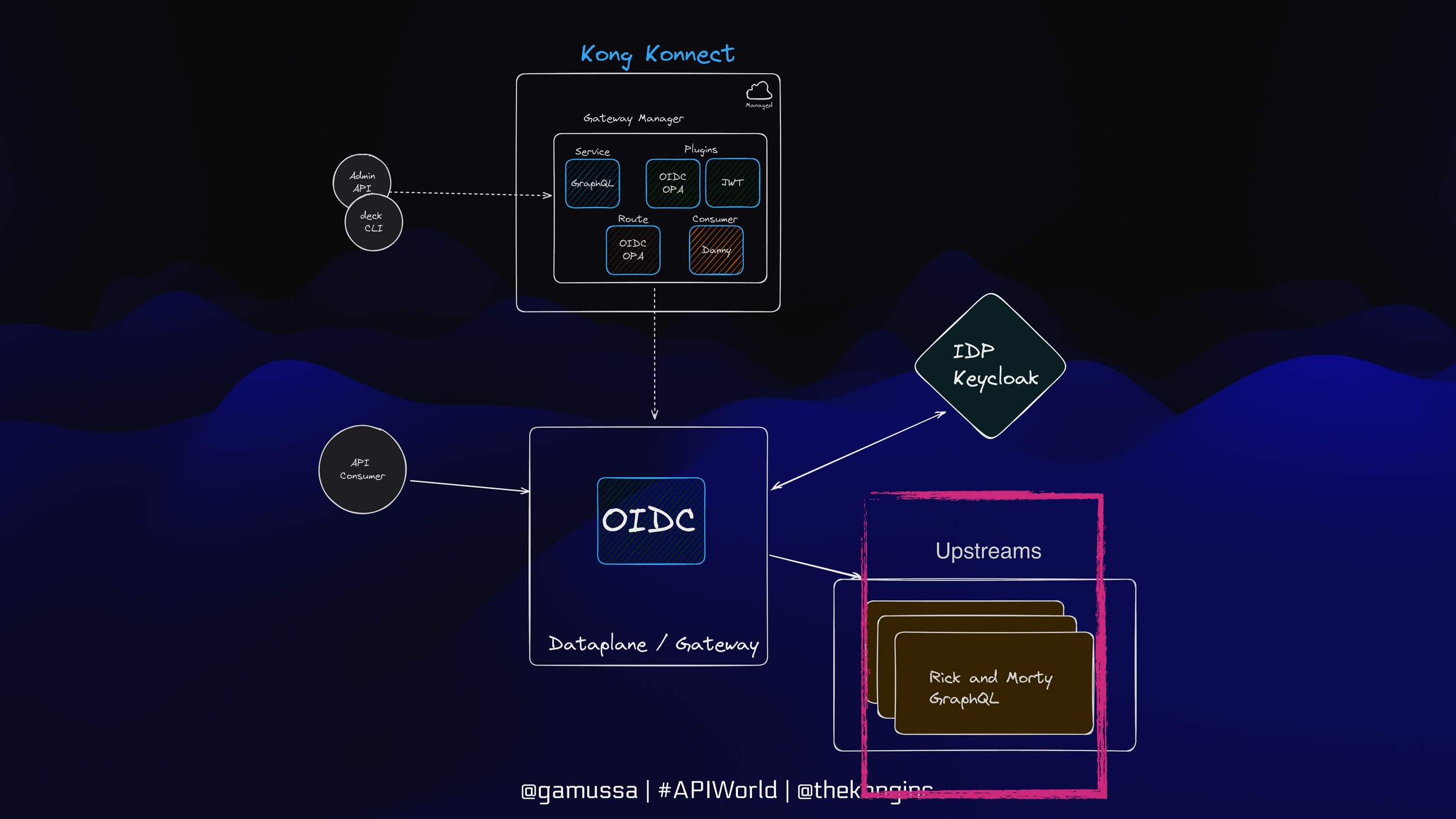
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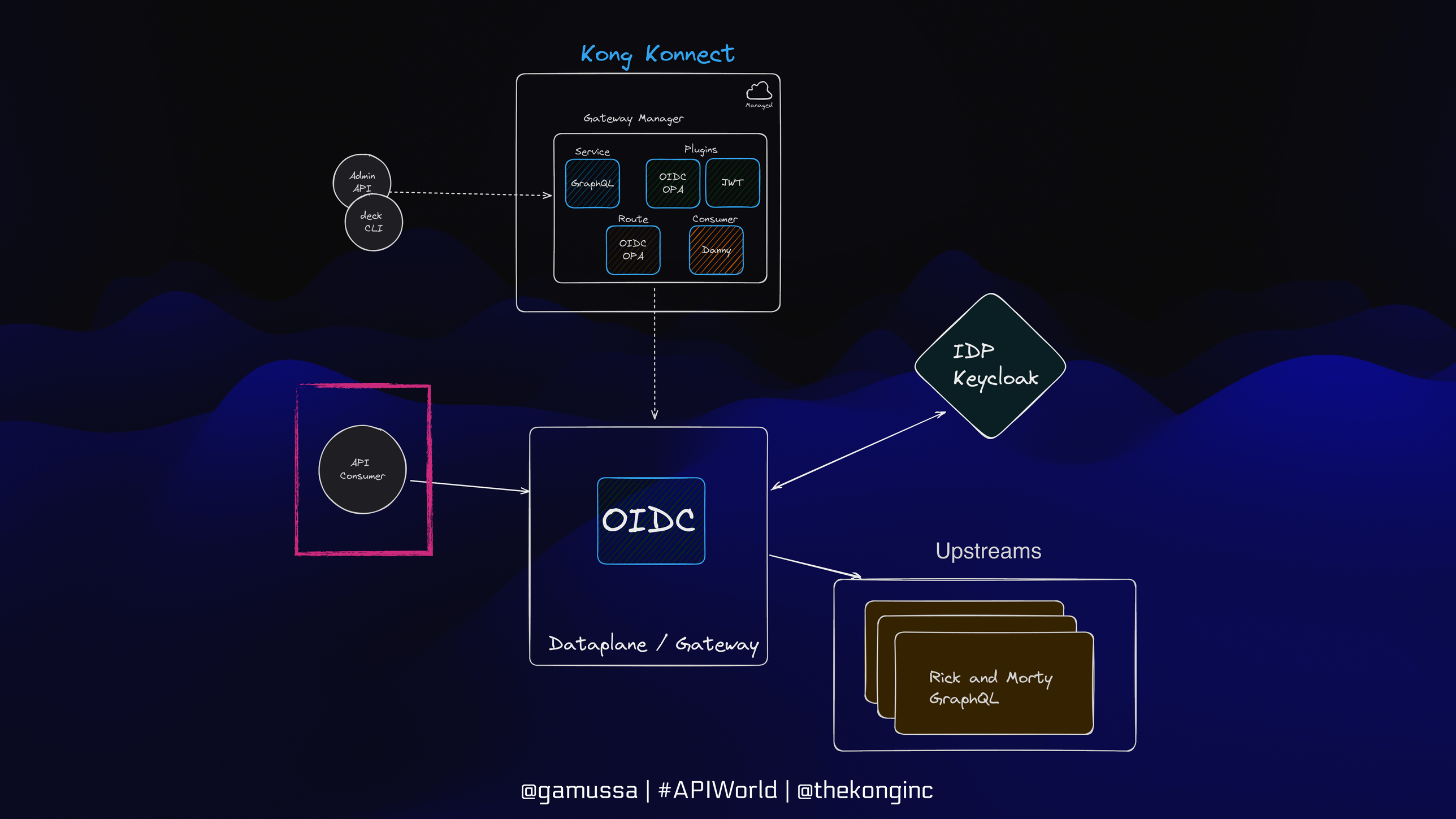
Granular Access Control with OPA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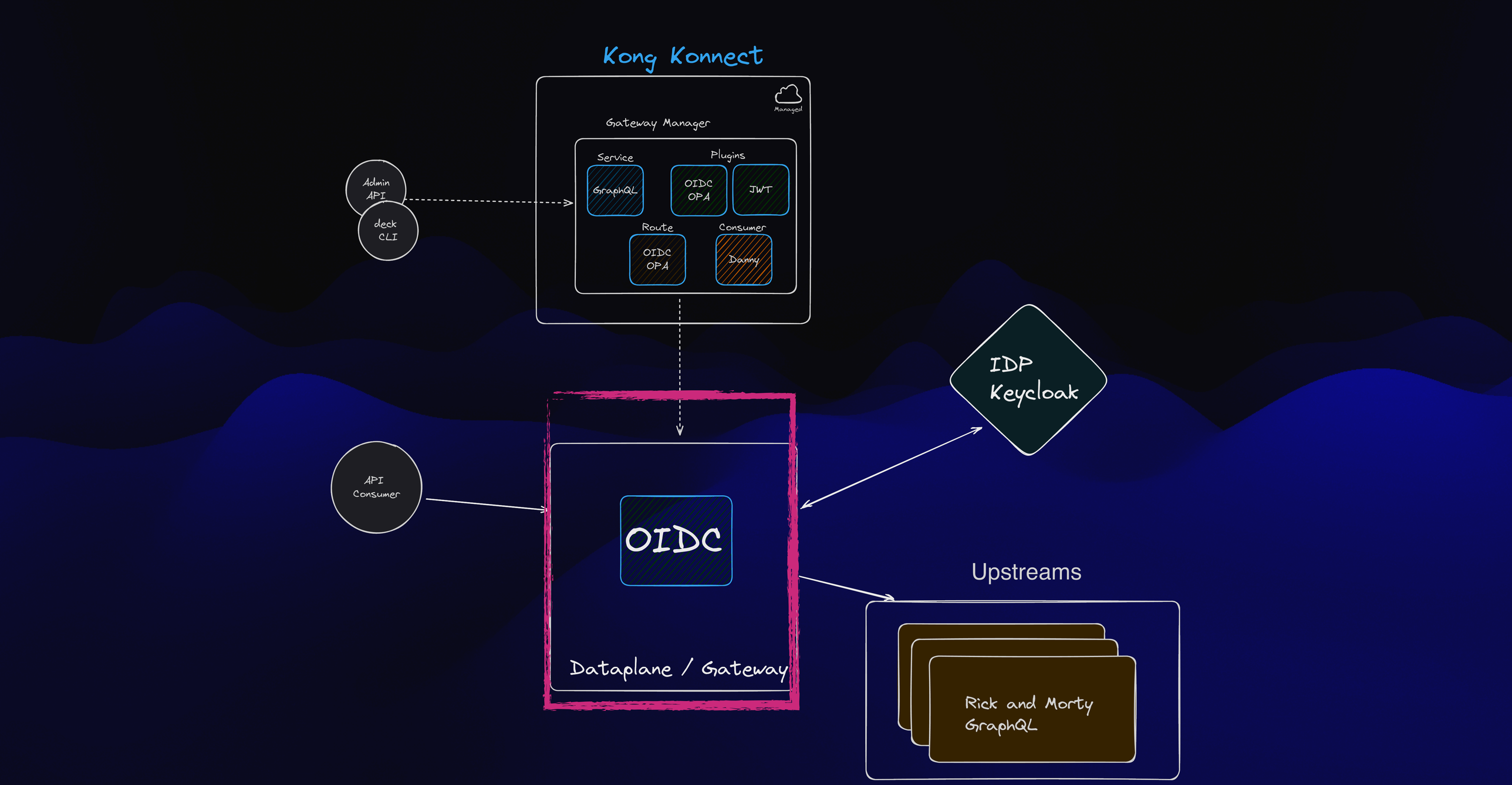
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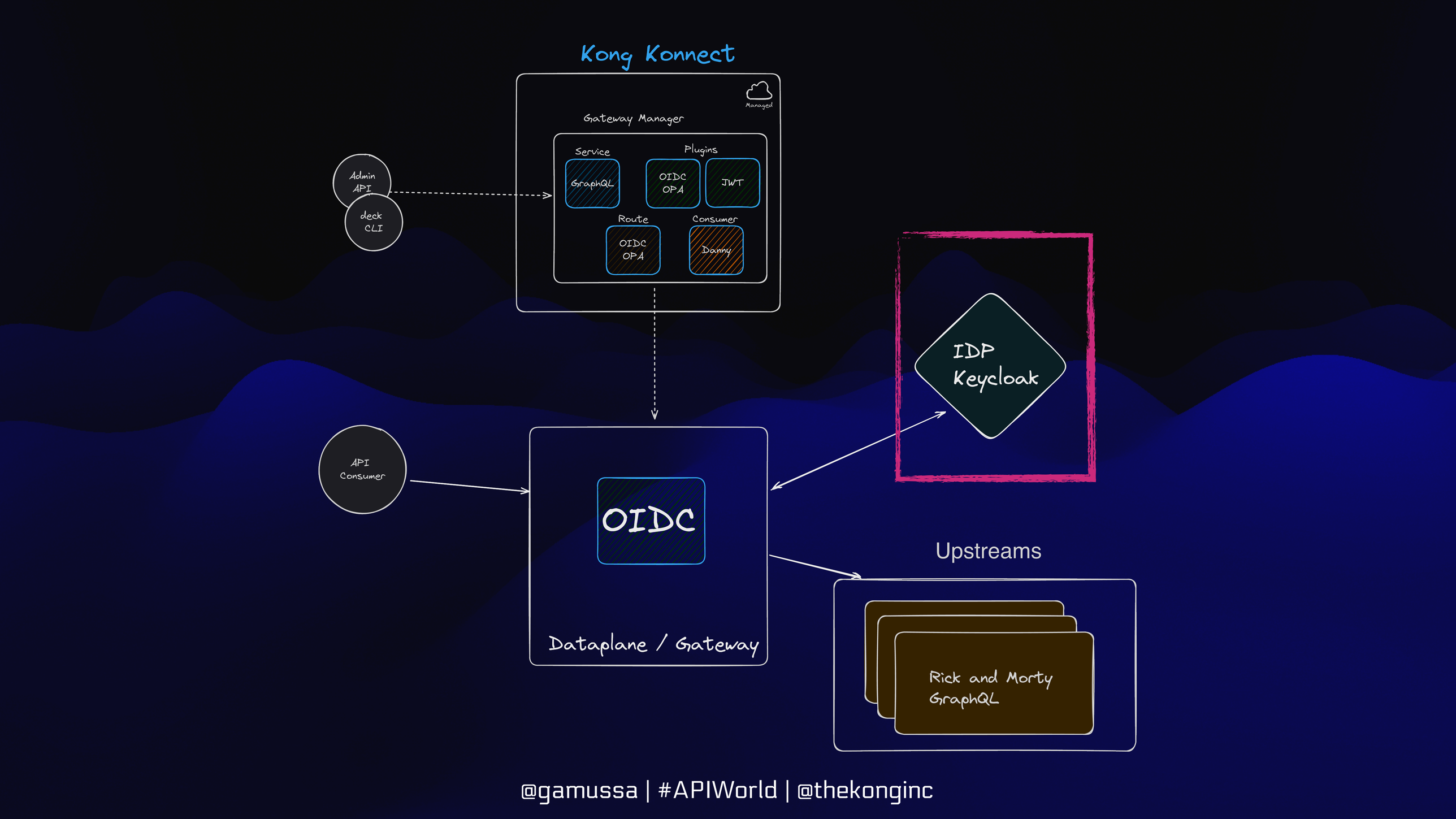
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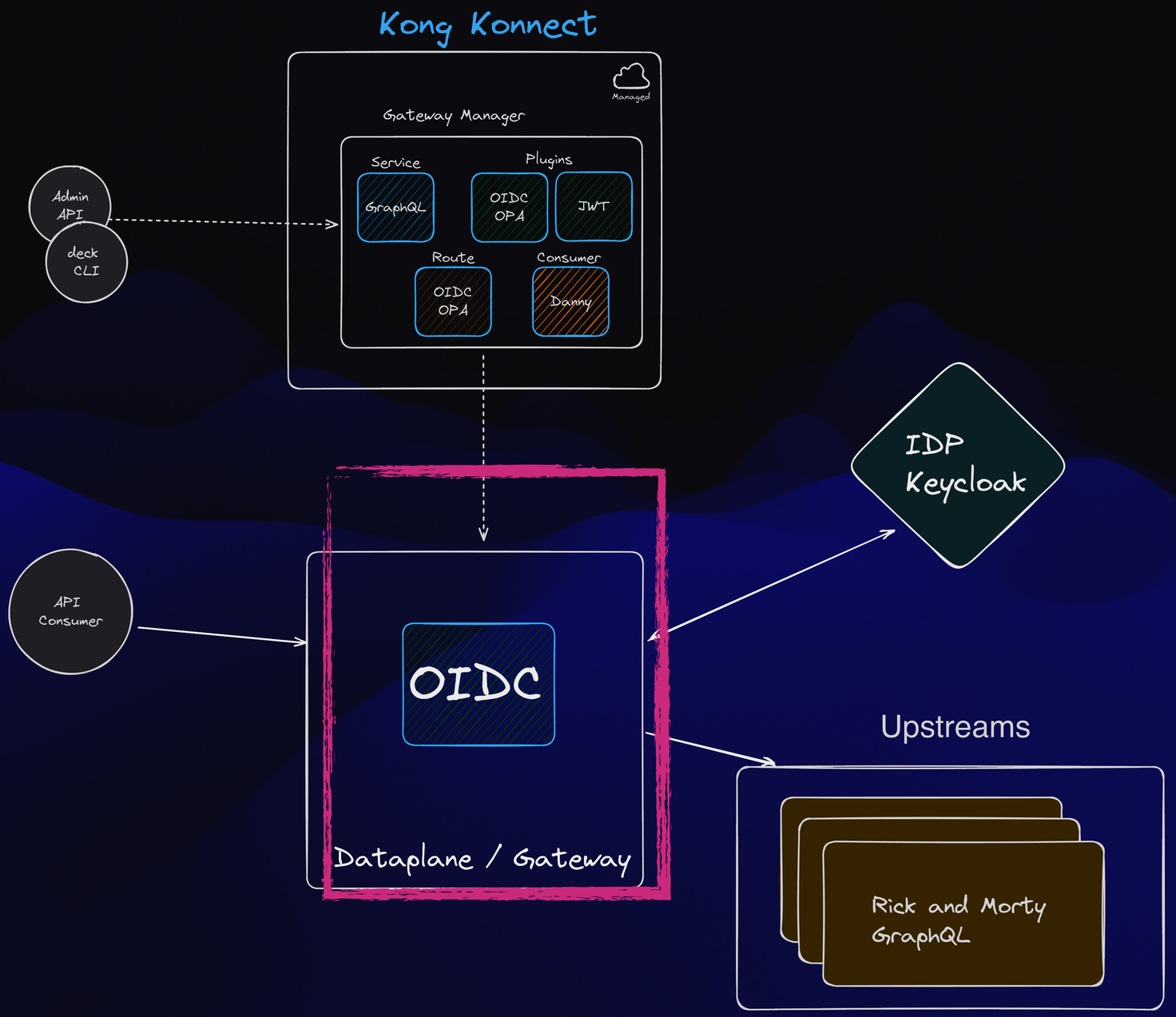
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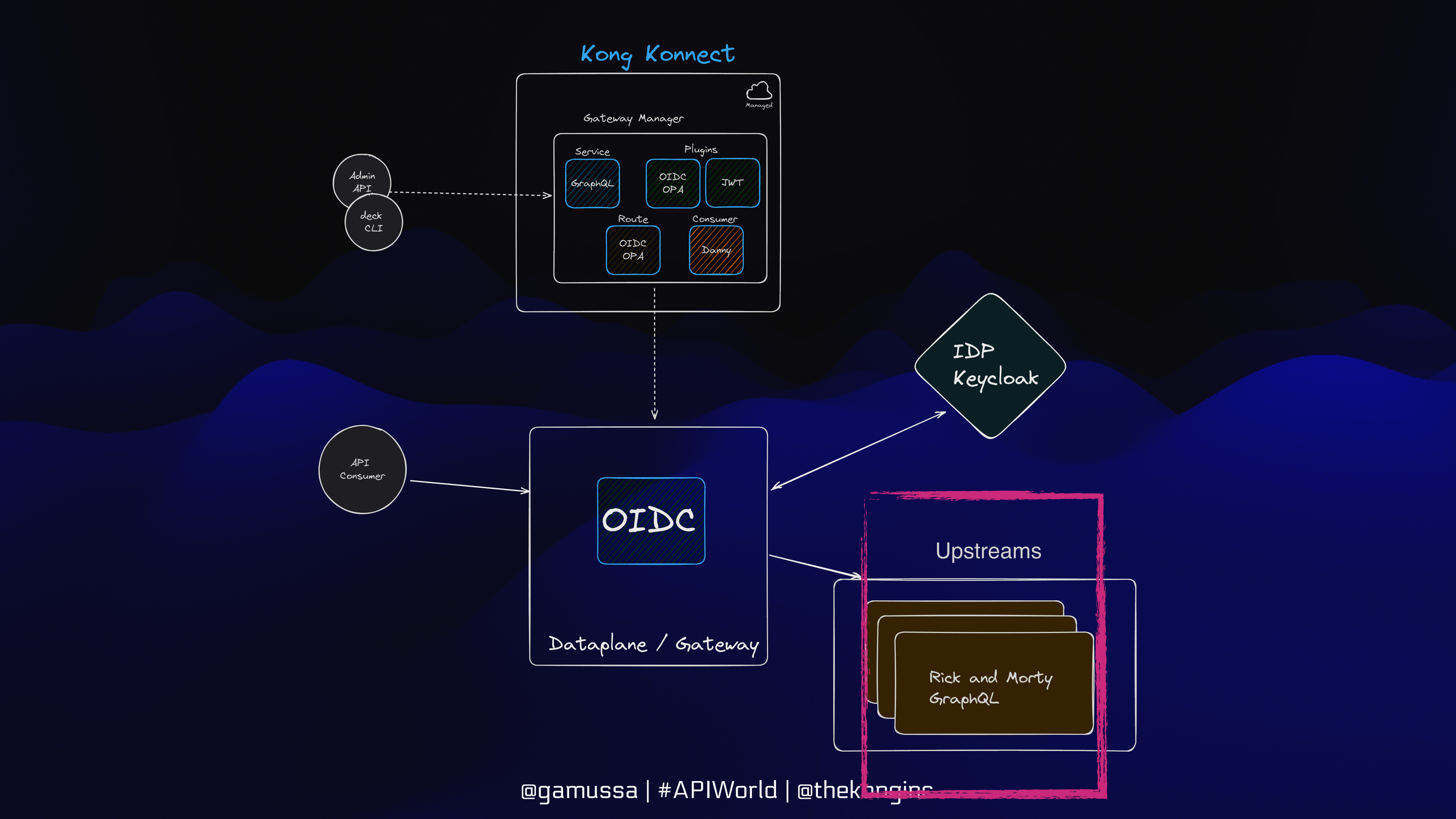
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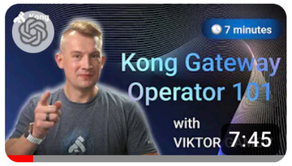
2 

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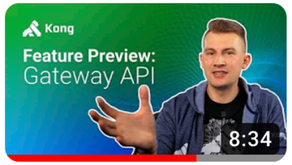
4 

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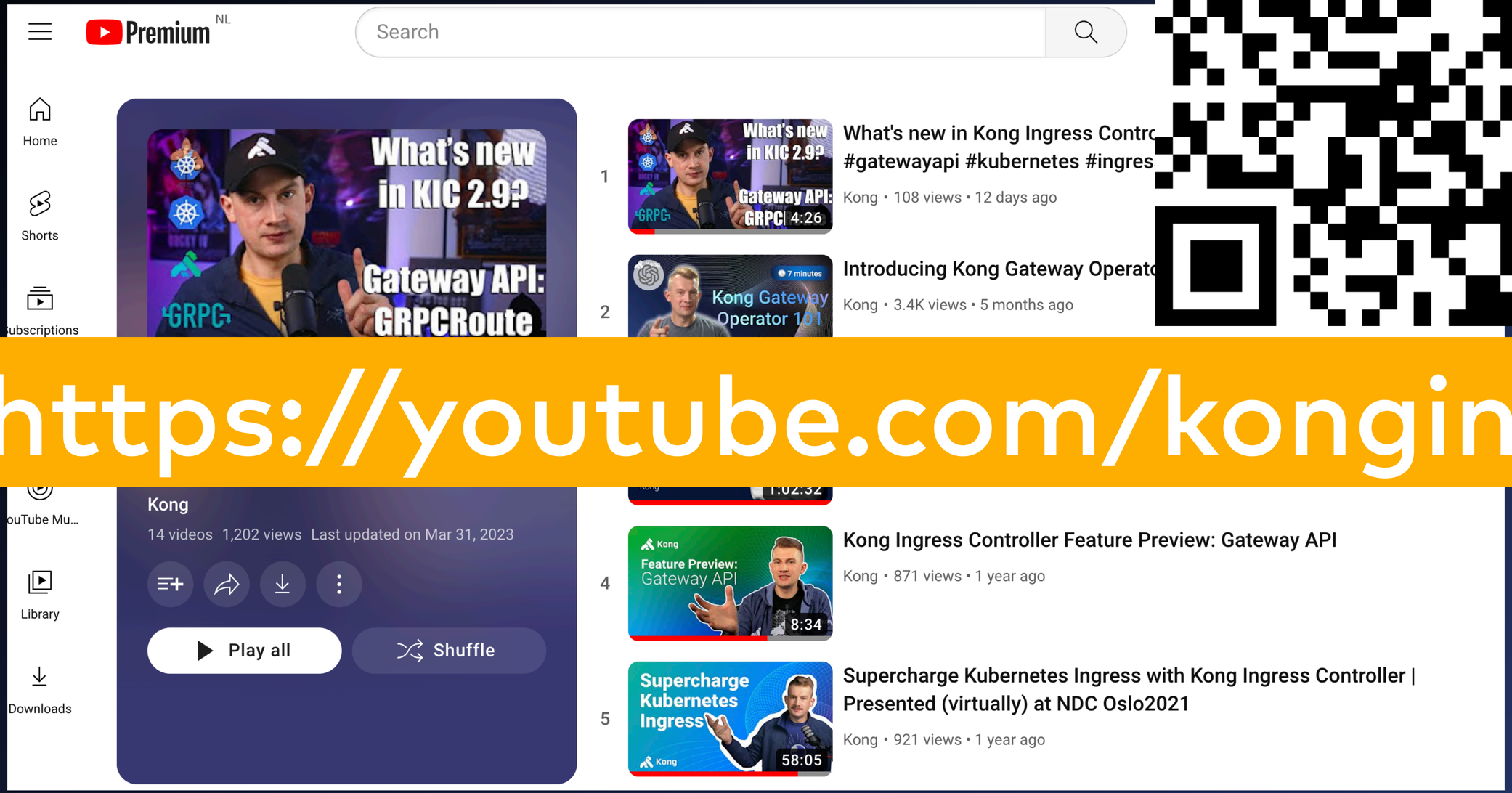

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