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Building innovative Apps with the QuickBooks API

Aaron Gourley, Reg Ouellette, Diana De Rose


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Session break-up

QuickBooks Online API

chata.ai

Intuit + GraphQL

AskQB

Today's speaker

Aaron Gourley
Solutions Engineer – Partner Integrations
@Gourleyman14

QuickBooks Online API

Agenda

Getting started with QuickBooks API

Tools & resources

Best practices

QuickBooks API resources

All QuickBooks API resources

Customer	Vendor	Employee	Lists	Currency	Supporting
Estimate	Purchase Order	Time Activity	Account	Company Currency	Attachable
Invoice	Bill	Banking	Budget	Exchange Rate	Batch
Payment	Bill Payment	Deposit	Class	Tax	CDC
Sales Receipt	Purchase	Transfer	Department	Tax Agency	Company Info
Refund Receipt	Vendor Credit	Accounting	Item	Tax Code	Entitlements
Credit Memo		Journal Entry	Payment Method	Tax Rate	Preferences
			Term	Tax Service	Reports

Getting started

3 Easy steps

- Create an Intuit Developer Account
- Create an app
- Generate OAuth tokens

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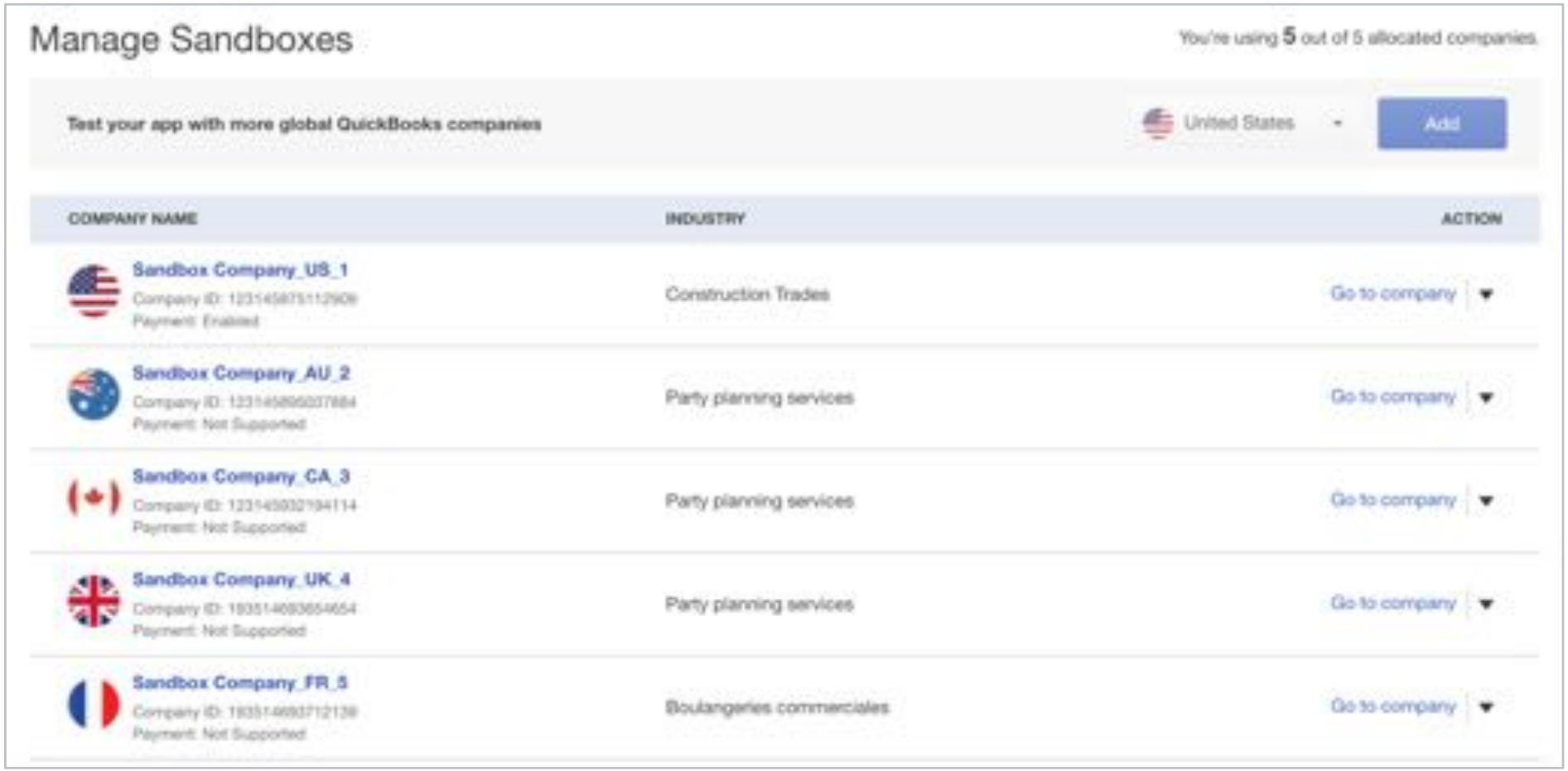
Developer tools

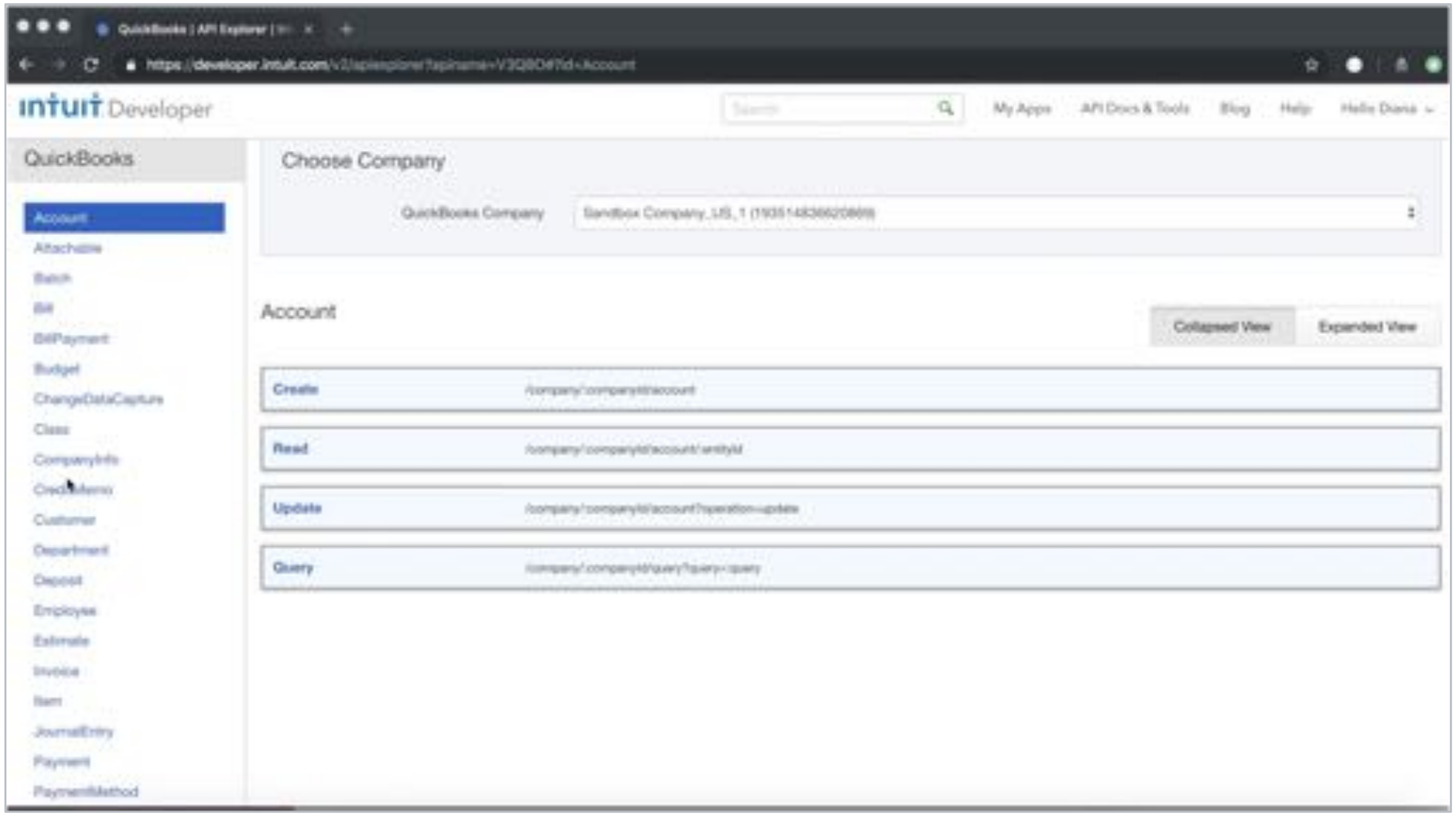
- OAuth playground
- Sandbox
- API explorer
- SDKs
- Sample code
- Postman

Sandbox

Sandbox URL – https://sandbox-quickbooks.api.intuit.com



API Explorer



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SDK

SDKs are open sourced – https://github.com/Intuit

Intuit SDK

Java

.NET

PHP

OAuth library

Java

.NET

PHP

Python

Node.js

Third-Party SDK

Node.js

Python

Ruby

Let the SDK do heavy-lifting for you, so you can focus on the cool features of your app

Samples

Samples are available at https://github.com/IntuitDeveloper

Languages

Java

.NET

PHP

Python

Node.js

Ruby

Go

CRUD

Java

.NET

PHP

Features

Concepts – Invoicing, Billing, Inventory management etc.

Payments

Webhooks

OAuth2

Samples help you understand use cases and write code faster

Best practices

- Webhooks + ChangeDataCapture (CDC)
- Batch
- Throttle limits
- Resiliency

Use SDKs to follow best practices

Why use Webhooks?

- Ensure data is in-sync
- Polling APIs is an inefficient way to get information
- Hollywood Principle - Don't call us, we will call you!

Why should you use Batch?

- Group several operations in a single HTTP request
- Reduces network overhead
- Optimize calls to the server and improve the scalability

Throttle limits

Adhere to throttle limits

- 10 concurrent requests per second per realmId
- 400 requests per min per realmId
- 40 batch requests/min per realmId, 10 payloads per batch request

Be resilient, handle the unexpected

Downtime happens

- Be prepared, retry transactions instead of skipping

Manage errors gracefully

- Notify users of any errors and potential ways to fix them

Webhooks -> ChangeDataCapture Fallback

- Consider calling CDC nightly in case of webhooks failures (e.g. due to network issues/downtime)

Tip: Use the 'requestid' request parameter to guarantee idempotency on retries

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CHATA.AI

Reg Ouellette

Today's speaker

Reg Ouellette
VP, Engineering and Integrations
@Rego_Tweetn

https://www.linkedin.com/in/reg-ouellette/

Agenda

What is chata.ai

Demo

High level architecture

chata.ai and v3 API

Future for chata.ai

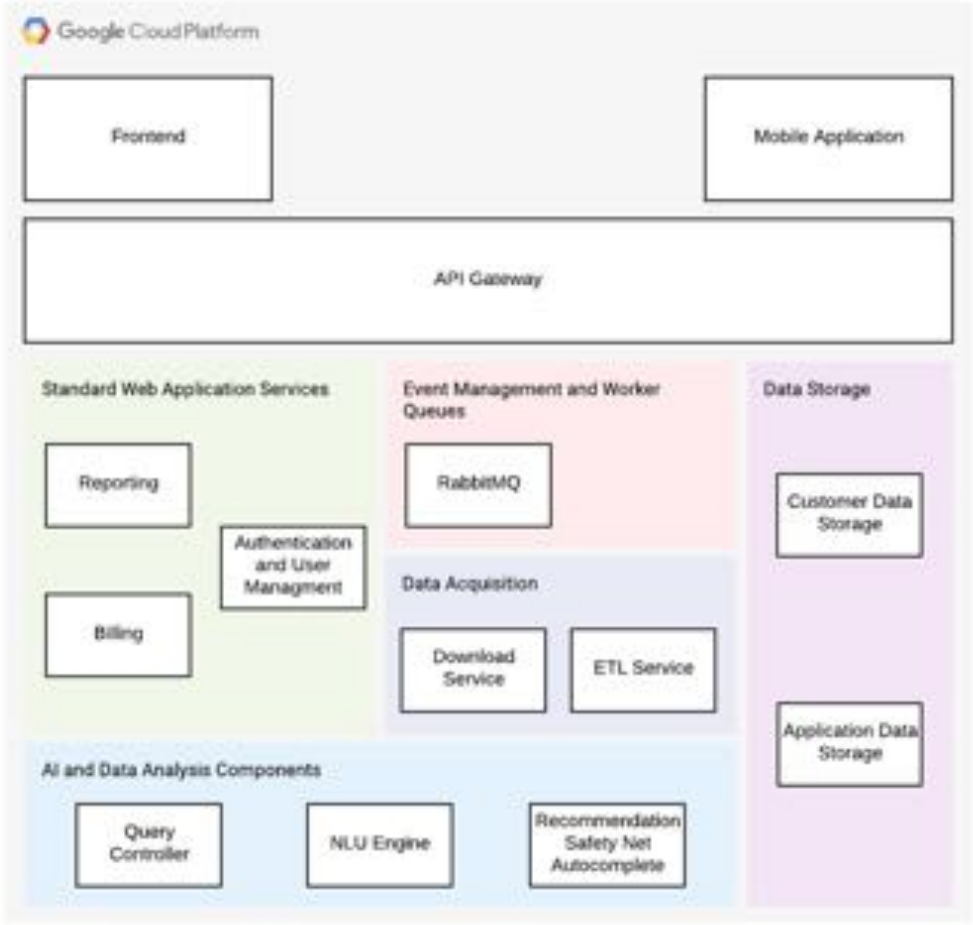
Lessons learned

What is chata.ai

- Conversational Business Intelligence platform
- Tableau released their 2019 trends in BI. Natural Language was #2
- Chata.ai was quite early to the party in this space.
  - Formed in 2016
  - Genesis of the company
  - api.ai and CSVs

Demo

High level architecture



mongoDB. Atlas

Notes

- Deployed in Google Cloud Platform.
- Microservices-based architecture.
- Kubernetes and Docker for orchestration of deployments.
- Customer data used by the application are physically segmented from each other.
- Data is encrypted at rest and in flight.

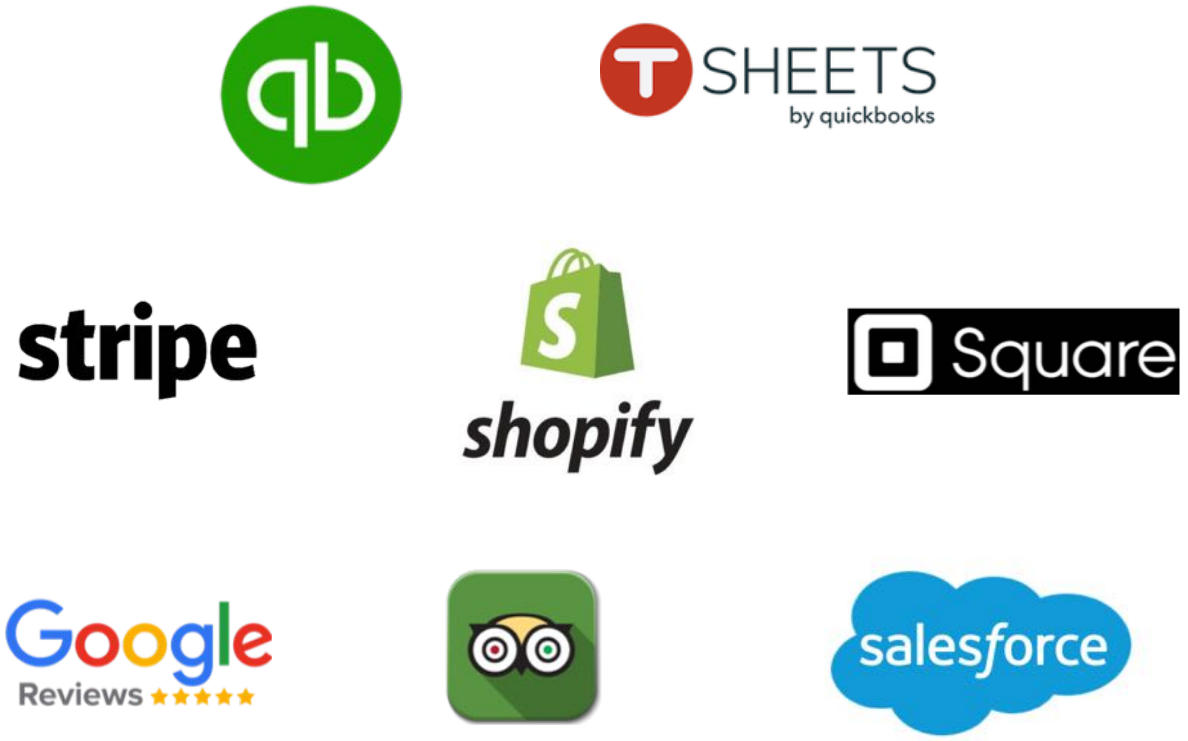
chata.ai and v3 API

V3 API categories

- Transactions resources
- Name list resources
- Supporting resources
- Report resources

Future for chata.ai

Become the "Hub" for all business data interaction



Lessons Learned

Leverage the SDKs

Prepare for scale early

- Batches for large downloads
- Prepare for throttling

Data wrangling

- Expect the unexpected

Resilience

Thanks!

@thechataHQ

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Intuit + GraphQL

Diana De Rose

Today’s speaker

Diana De Rose
Software Engineer
@derosediana

Agenda

What is GraphQL?

Introduction to Queries and Mutations

Structure of a GraphQL Request

Building better apps with GraphQL

What is GraphQL?

Powerful features allow clients to define their own API

Query Language for APIs

GraphQL is a query language for APIs, and a runtime to fulfill those requests.

Ask for exactly what you need, and get it

Request specific fields from the API and get exactly what you requested, and nothing more.

Get many resources in one request

GraphQL queries allow you to retrieve data across many resources in a single request, and easily follow references between them.

"At its simplest, GraphQL is about asking for specific fields on objects." [graphql.org]

Queries and Mutations

Fields on objects can be requested from the server

```
{
   company {
      name
   }
}
```

```
{
   "data": {
      "company": {
         "name": "DJ's Artwork"
      }
   }
}
```

The shape of the query is reflected in the shape of the response, so clients know what to expect.

Queries and Mutations

Objects can also be represented by fields

```
{
   company {
      name
      transactions {
         dueDate
      }
   }
}
```

```
{
   "data": {
      "company": {
         "name": "DJ's Artwork",
         "transactions": [
            { "dueDate": "3/11/2018" },
            { "dueDate": "3/23/2018" }
         ]
      }
   }
}
```

Queries in GraphQL can traverse related objects, and access their fields.

Queries and Mutations

Arguments can be passed to Fields

```
{
   company {
      name
      transactions (type: invoice) {
         dueDate
      }
   }
}
```

```
{
   "data": {
      "company": {
         "name": "DJ's Artwork",
         "transactions": [
            { "dueDate": "12/1/2018" },
            { "dueDate": "12/4/2018" }
         ]
      }
   }
}
```

Every field and nested object in GraphQL can define its own set of arguments.

Queries and Mutations

Named operations can be beneficial to clients

```
query GetNameAndTxns {
   company {
      name
      transactions (type: invoice) {
         dueDate
      }
   }
}
```

```
{
   "data": {
      "company": {
         "name": "DJ's Artwork",
         "transactions": [
            { "dueDate": "12/1/2018" },
            { "dueDate": "12/4/2018" }
         ]
      }
   }
}
```

Named operations are required to use multiple operations in a single request.

Queries and Mutations

Variables can pass dynamic data to arguments

```
query GetNameAndTxns ($type:String) {
   company {
      name
      transactions (type: $type) {
         dueDate
      }
   }
}

{
   "type": "invoice"
}
```

```
{
   "data": {
      "company": {
         "name": "DJ's Artwork",
         "transactions": [
            { "dueDate": "12/1/2018" },
            { "dueDate": "12/4/2018" }
         ]
      }
   }
}
```

Variables are highly beneficial in writing reusable, less complex code.

Queries and Mutations

Aliases allow clients to query the same fields with different arguments

```
{
   company {
      name
      invoices: transactions (type: invoice) {
         dueDate
      }
      bills: transactions (type: bill) {
         dueDate
      }
   }
}
```

```
{
   "data": {
      "company": {
         "name": "DJ's Artwork",
         "invoices": [
            { "dueDate": "12/1/2018" }
         ],
         "bills": [
            { "dueDate": "11/19/2018" }
         ]
      }
   }
}
```

Aliases let clients rename fields to anything they want, defining their own API.

Queries and Mutations

Fragments are reusable collections of fields

```
{
   company {
      name
      invoices: transactions (type: invoice) {
         … transactionFields
      }
      bills: transactions (type: bill) {
         … transactionFields
      }
   }
}

fragment transactionFields on Transaction {
   dueDate
}
```

```
{
   "data": {
      "company": {
         "name": "DJ's Artwork",
         "invoices": [
            { "dueDate": "12/1/2018" }
         ],
         "bills": [
            { "dueDate": "11/19/2018" }
         ]
      }
   }
}
```

Fragments can be stored separately in your codebase, and used across GraphQL requests.

Queries and Mutations

Mutations allow modifications of server-side data

```
mutation CreateTransaction ($input: TxnInput!) {
   createTransaction (input: $input) {
      transaction {
         dueDate
      }
   }
}
{
   "input": {
       "transaction": {
          "dueDate": "11/30/2018",
          "amount": 33.00
      }
   }
}
```

```
{
   "data": {
      "createTransaction": {
         "transaction": {
            "dueDate": "11/30/2018"
         }
      }
   }
}
```

Multiple fields are supported in mutations, and they run in series, rather than parallel.

Structure of a GraphQL Request

HTTP Request is encoded when sent to the server

```
POST /graphql
Host: v4.api.intuit.com

{
   "query":"{\n  company {\n    name\n  }\n}\n",
   "variables": "",
   "operationName":""
}
```

```
200 OK

{
   "data": {
      "company": {
         "name": "DJ's Artwork"
      }
   },
   "errors": {…}
}
```

GraphQL requests aren't rocket science. They are just an efficient way to request the same data.

Building better apps with GraphQL

Use the power of GraphQL to build faster and less complex apps

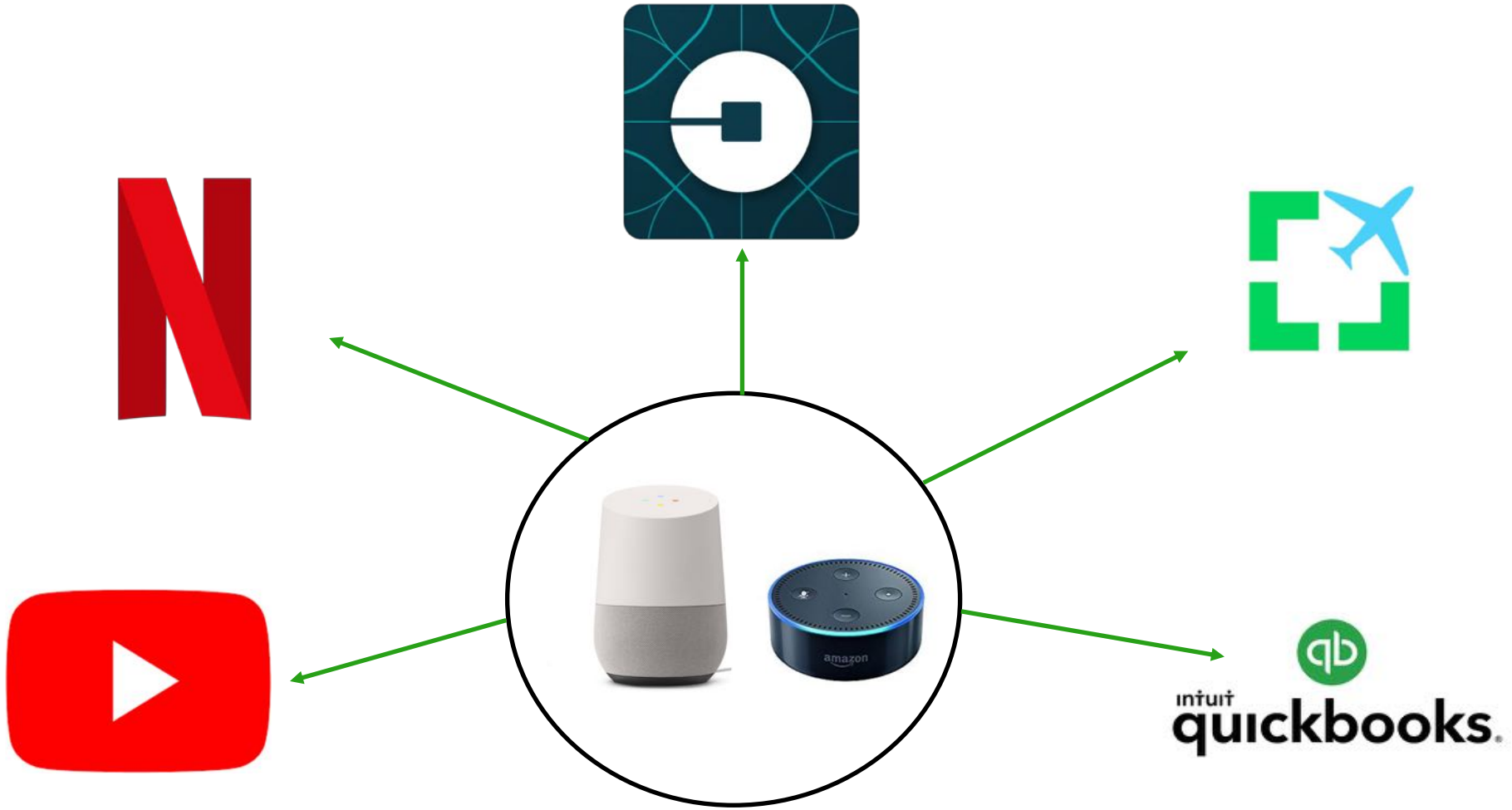
GraphQL benefits

As a recap:

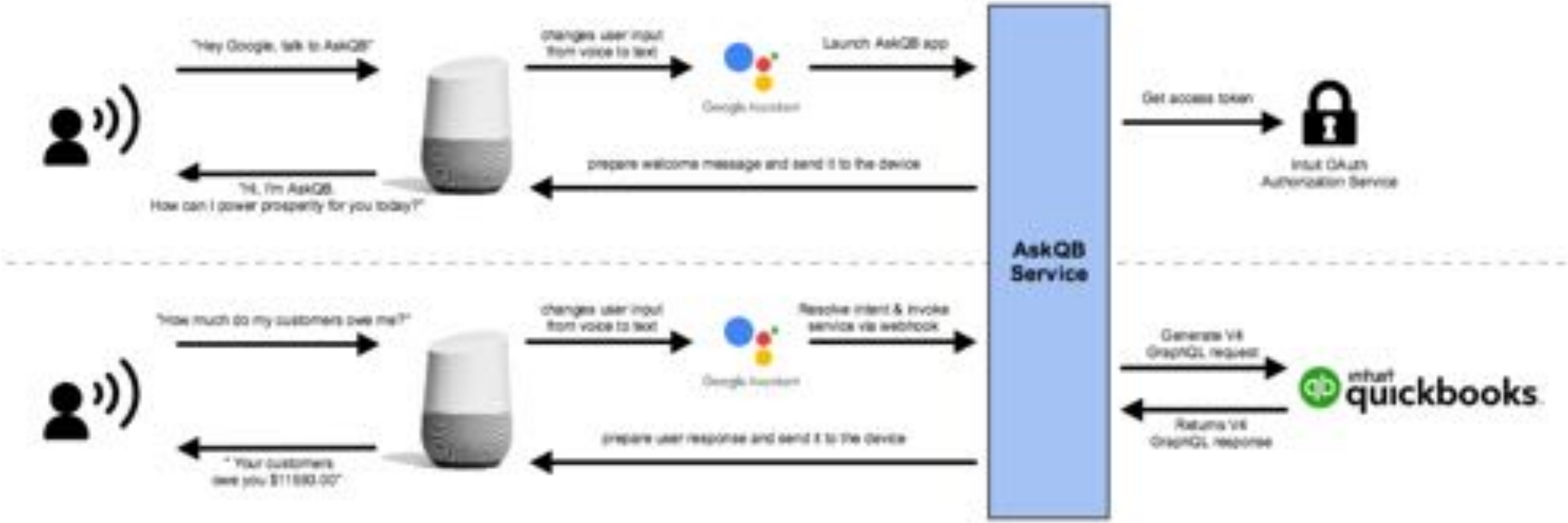
- Eliminates over-fetching and under-fetching
- Allows clients to define the API that they need
- Fragments and variables make code reusable
- No breaking changes
- Used internally by Intuit

AskQB Demo

Accessing my Data with Voice – Any Device, anytime, anywhere



AskQB Google Assistant app diagram



Sample V4 GraphQL Request

Query all invoices with outstanding balance

```
query TransactionsFilter {
  company {
    transactions (filterBy:"type='INVOICE' && traits.balance > '0'") {
      edges {
        node  {
          type
          header {
            amount
            txnDate
          }
          traits {
            balance
          }
        }
      }
    }
  }
}
```

Sample V4 Response


```
{
  "data": {
    "company": {
      "transactions": {
        "edges": [
          {
            "node": {
              "type": "INVOICE",
              "header": {
                "amount": "12.00",
                "txnStatus": "OPEN"
              },
              "traits": {
                "balance": "12.00"
              }
            }
          }
        ]
      }
    },
    "errors": []
}
```

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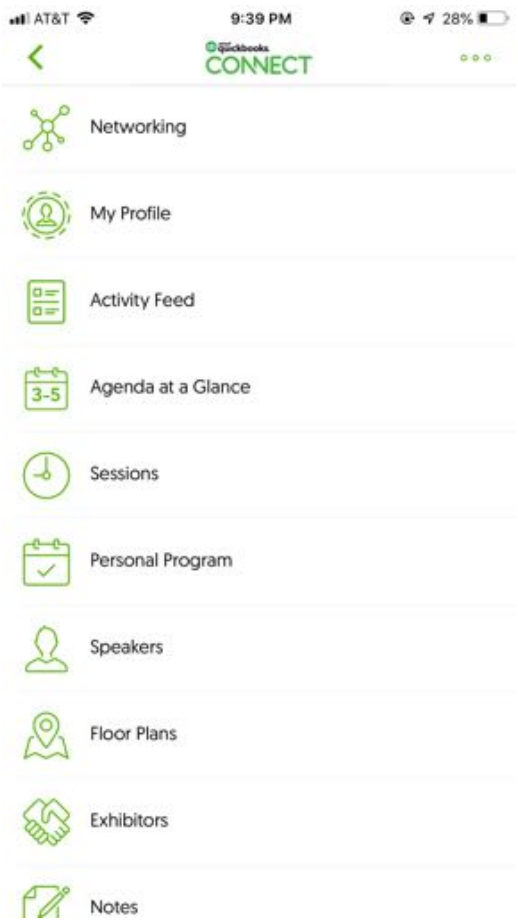
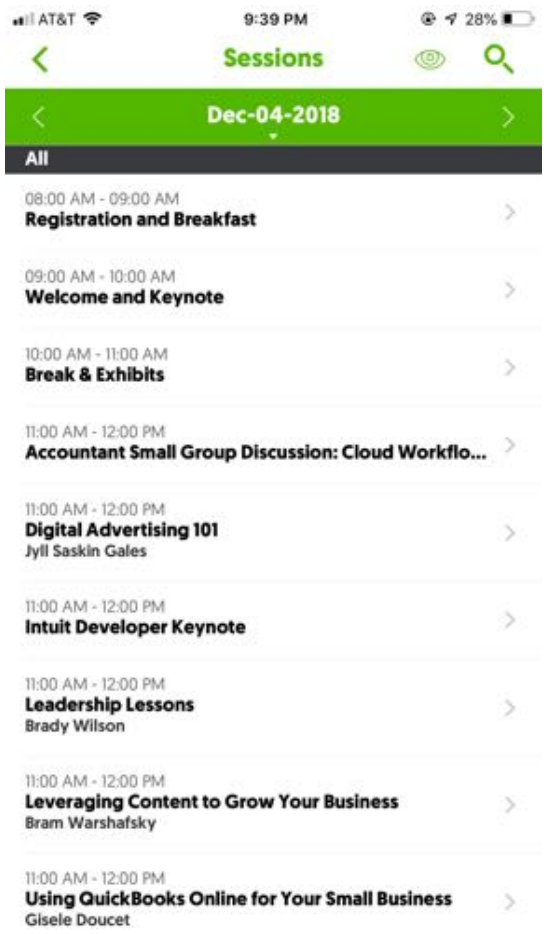


2. Select **Title**



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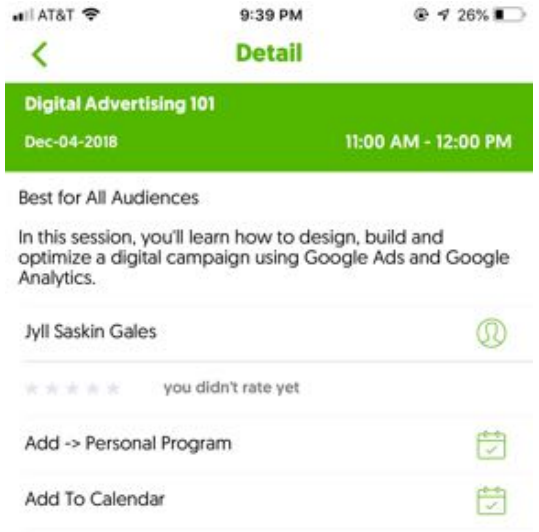

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