



**BIG QUERY**



## Agenda

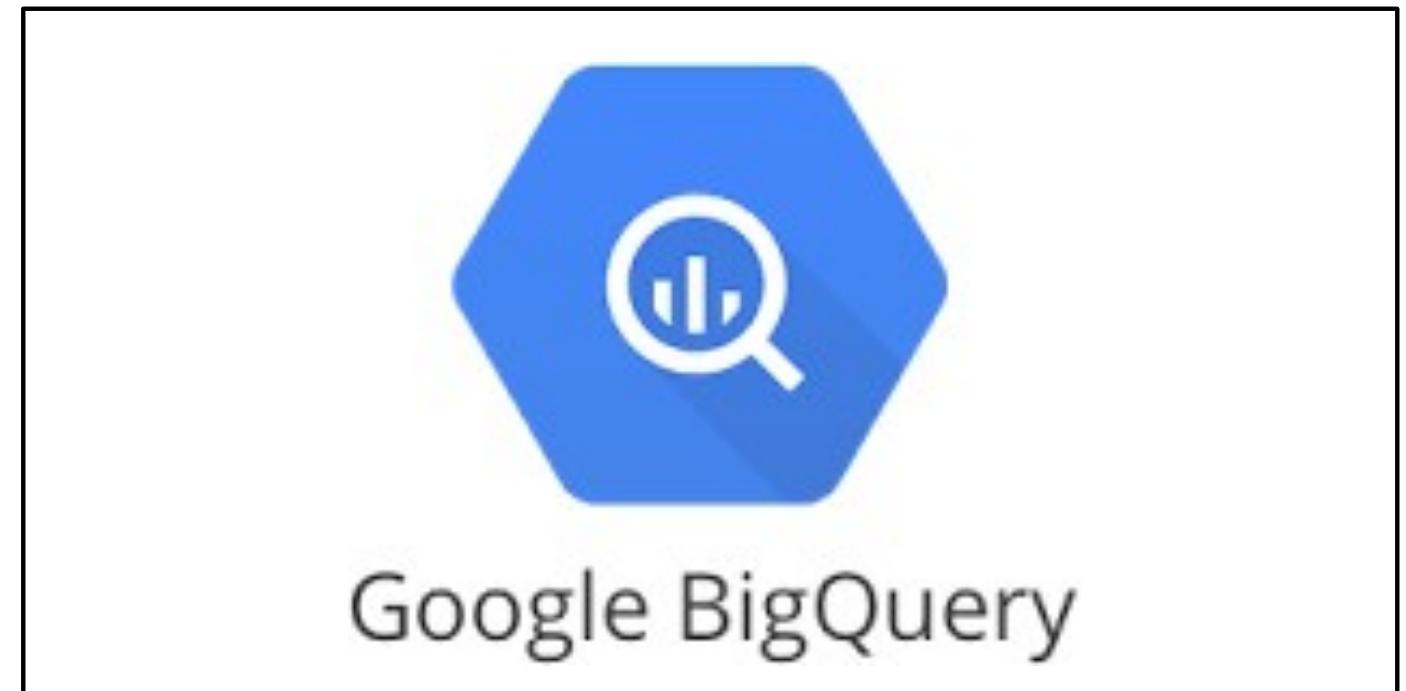
### Overview

- What is BigQuery and its features
- Pricing
- Comparison to other GCP technologies
- BigQuery Data Model

Datasets, tables and views

### Demos

- Setting Up and Accessing BigQuery Web UI
- Creating Datasets and Tables in BigQuery
- Loading Local Data to BigQuery
- Accessing BigQuery from Jupyter notebooks





# What is Big Query

## Query as a Service

- Runs on Google's cloud infrastructure

## Massively Scalable

- Process trillions of records in seconds
- Terabytes in seconds, petabytes in minutes

## Queries are based on SQL



## BigQuery as an analytical data warehouse

- Serverless operations
- Pay for storage and queries
- Visualizing data with Data Studio

# Varied requirements for analysis



## Order Management Support

John is responsible for tracking and delivering orders on time



## Revenue Analyst

Anna is responsible for tracking and monitoring revenues

# Transactional and Analytical Processing



**Transactional Processing**



**Analytical Processing**

# Transactional and Analytical Processing



## Transactional Processing

Analyzes individual entries

Access to **recent** data, from the last few hours or days

**Updates** data

Fast **real-time** access

Usually a **single** data source

## Analytical Processing

Analyzes **large batches** of data

Access to **older** data going back months, or even years

Mostly **reads** data

**Long** running jobs

**Multiple** data sources

# Transactional and Analytical Processing



## Small Data

Both these objectives could be achieved  
using the **same** database system



## Small Data



Single machine with backup

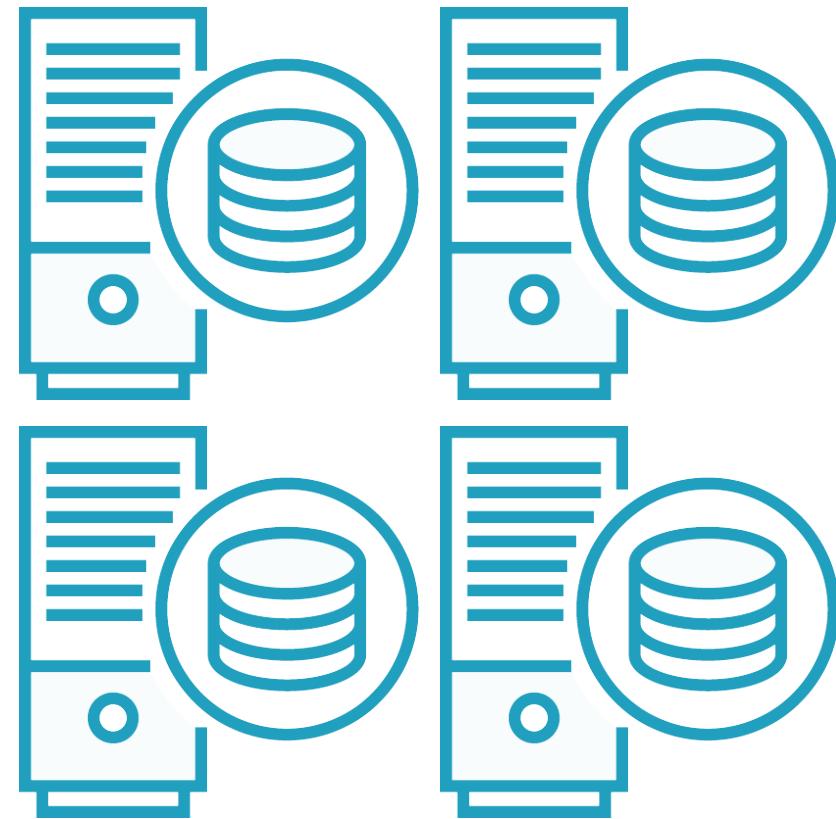
Structured, well-defined data

Can access individual records or the entire dataset

No replication, updated data available instantaneously

Different tables store data from different sources

# Transactional and Analytical Processing

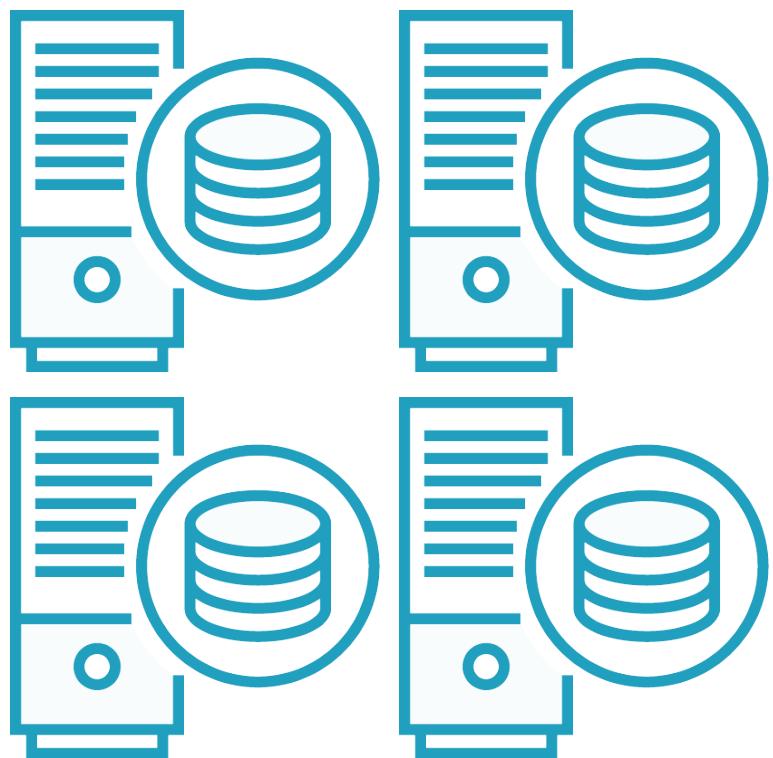


## Big Data

Very hard to meet all requirements with  
the same database system



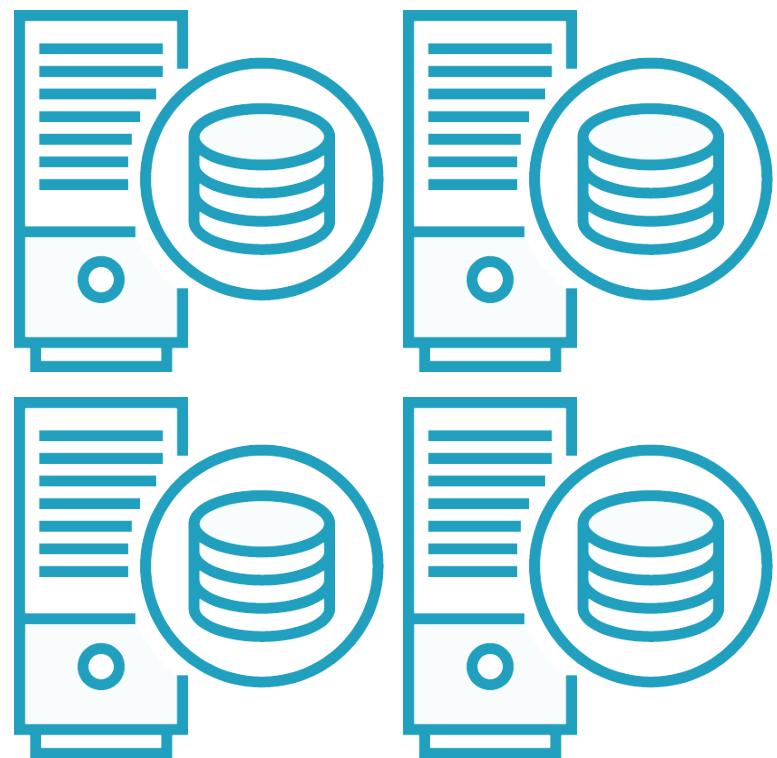
# Big Data



- Data distributed on a cluster with **multiple** machines
- Semi-structured or **unstructured** data
- Data **replicated**, propagation of updates take time
- Different sources may have **different formats**



## 3 Vs of Big Data



**Volume:** Amount of data

**Variety:** Number and type of sources

**Velocity:** Batch and streaming

# Transactional and Analytical Processing



Transactional Processing

Traditional  
RDBMS



Analytical Processing

Data Warehouse



Google BigQuery

BigQuery is a Data Warehouse that is  
fully managed like a RDBMS

# BigQuery for Analytics and Data Warehousing

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# BigQuery vs. Traditional Data Warehouses



## BigQuery

Complex **analytical** queries  
Scales to **Petabytes**  
Both reads and **updates**  
Fast **real-time** or batch access  
Multiple data sources  
Streaming as well as batch

## Traditional Data Warehouse

Complex **analytical** queries  
Scales to **Petabytes**  
Mostly **reads**  
Long running jobs  
Multiple data sources  
Often more focus on **batch**

# BigQuery vs. Traditional RDBMS



## BigQuery

Access using SQL  
Scales to Petabytes  
No ACID or transaction support  
Serverless  
No indices, no provisioning

## Traditional RDBMS

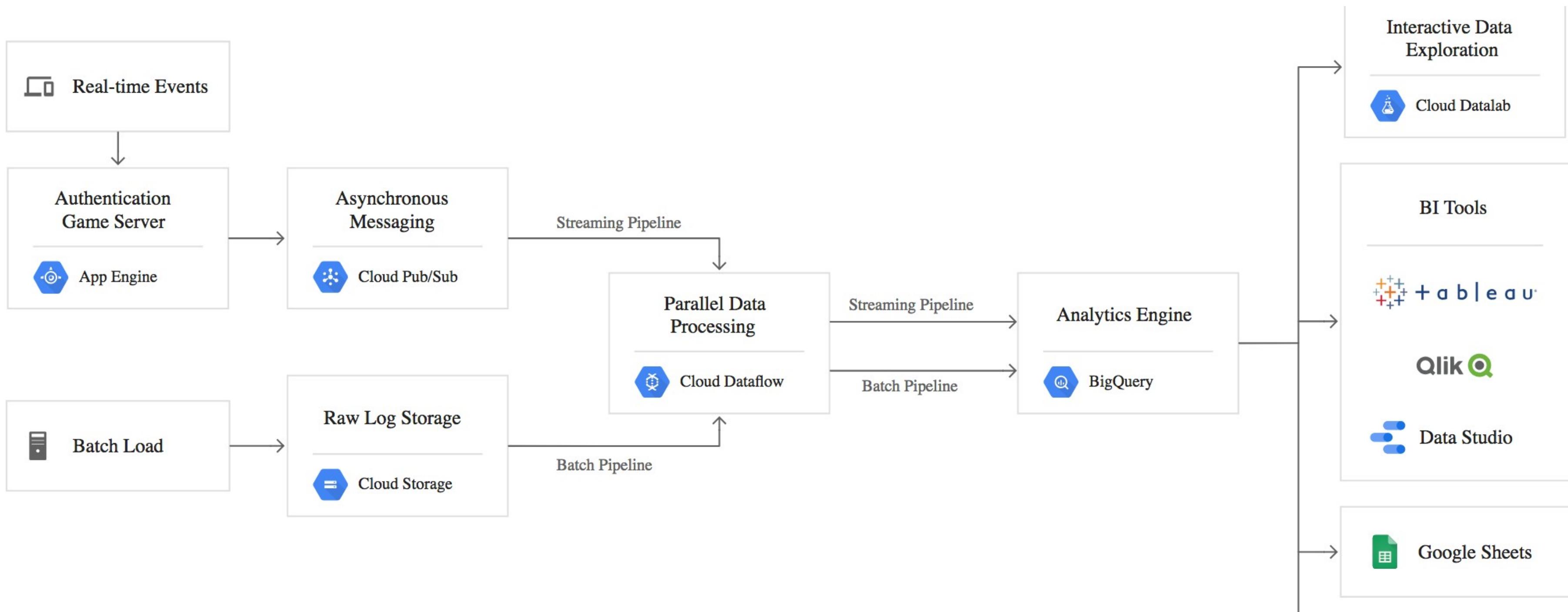
Access using SQL  
Usually top out at Terabytes  
Strong emphasis on ACID and transaction support  
Classic example of server  
Heavy administrative overhead



# BigQuery Features

Serverless: No cluster, no provisioning  
Autoscaling  
Automatic high availability

# Solution architecture - GCP



# Support for the 3Vs



**Volume:** Scales to petabytes

**Variety:** Federated data sources

- Cloud storage
- BigTable
- Google Drive spreadsheets

**Velocity**

- Streaming ingestion
- Real-time queries



# SQL Support

## Standard SQL

- ANSI:2011 compliant
- Extensions for nested/repeated fields

## Legacy SQL



Google BigQuery



# Data Locality



Google BigQuery

Some support for specific locations  
US, Japan, EU



# BigQuery ML

Currently in Beta  
Simple model building and use  
All in SQL from within BigQuery

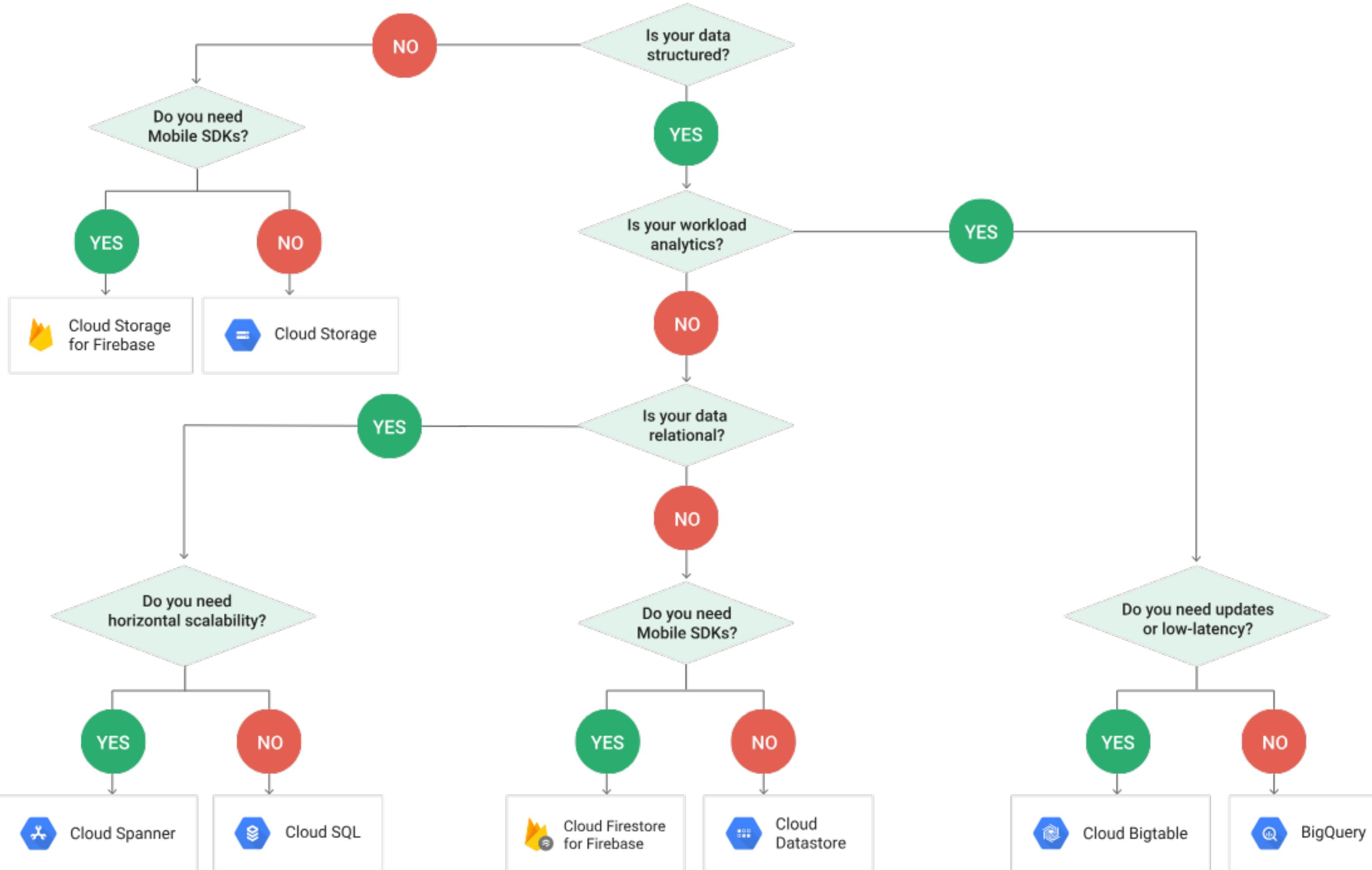


Google BigQuery

# Cloud Storage options

Product	Type	Similar Products
Cloud Storage	Object Storage	S3, HDFS
Cloud SQL	RDBMS	MySQL, PostgreSQL
Cloud Spanner	RDBMS	Oracle
Cloud BigTable	NoSQL – Columnar	Hbase, Cassandra
Cloud DataStore	NoSQL – Document	MongoDB, ElasticSearch
Cloud MemoryStore	NoSQL – Key Value	Redis
BigQuery	Data Warehouse	Hive, HBase

# GCP Storage Options



# Choosing BigQuery

BigQuery	AWS Redshift
GCP data warehousing solution	AWS data warehousing solution
Serverless - no provisioning needed	Provisioning needed - more like BigTable
Autoscaling - no control over compute	Scale up by adding nodes
No operations needed	Some operations and cluster maintenance indeed needed

# Big Query - Overview

1

## Strengths

- Serverless
- SQL support
- Scalability
- Flexible data sources

2

## Shortcomings

- Native to GCP
- ACID
- Transactions
- Costs

3

## Applications

- Data warehouse
- Ad hoc querying
- Searchable repository

# BigQuery Pricing

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# BigQuery

## Pricing



Storage costs

Query costs

Free operations



# BigQuery Costs



# Storage Costs

Active	Long-term
Data in tables modified in last 90 days	Data in tables not modified in last 90 days
Currently approximately 2 cents/GB/month	About 50% lower; currently about 1 cent/GB/month
First 10 GB is free	First 10 GB is free
When table is edited, pricing reverts to active	When table is not edited, pricing automatically drops to long-term



# Query Costs

## On-demand

Based solely on usage

\$5 per TB/month; First 1TB/month free

## Flat-rate

Predictable, fixed monthly costs

\$40,000/month for 2000 slots\*;  
\$10,000 per 500 additional slots

## BigQuery Slot

Unit of computational capacity required to execute SQL queries. BigQuery automatically calculates how many slots are required by each query, depending on query size and complexity.



# Free Operations

Loading data

- (Streaming inserts not free)

Copying data

Exporting data

Deleting datasets

Deleting tables, views, partitions

Metadata operations



Google BigQuery



# Minimizing Costs



Google BigQuery

- Query only columns you need
- Use table preview to explore data
- Don't run queries just to explore
- Calculate query price before running



# Summary

BigQuery is a cloud data warehouse  
Standard SQL and ODBC/JDBC drivers  
No clusters, no servers  
“No-ops” - not even indices  
Autoscaling right to petabytes  
Streaming and real-time analytics

# BigQuery Data Model

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# BigQuery Data Model



## Datasets

Top-level container used to organize and control access to tables and views. A table or view must belong to a dataset.

## Tables

Contains individual records organized in rows. Each record is composed of columns (also called fields)

## Views

Virtual table defined by a SQL query. Whenever a user queries the view, the underlying view-query is executed



# Data Location



Google BigQuery

Geographic location can be specified at create-time

After creation, location becomes immutable

US, EU, Asia (Japan)



# Dataset Features



Google BigQuery

- Access control at dataset level
- Labels can be assigned
- Expiration time for new tables



# Public Datasets

Stored in BigQuery

Google pays for storage

Available for general usage via a project

User pays for queries



Google BigQuery



# Advantages of Views

Reduce query complexity

Restrict access to data

Construct different logical tables  
from the same physical table



Google BigQuery



# DEMOS



# SETTING UP AND ACCESSING BIGQUERY WEB UI



# Creating a new project

Go to this link:

<https://console.cloud.google.com/projectselector2/home/dashboard>

The screenshot shows the Google Cloud Platform Dashboard. The URL in the address bar is <https://console.cloud.google.com/projectselector2/home/dashboard>. The dashboard itself displays a message: "To view this page, select a project." with "SELECT" and "CREATE" buttons. On the left, there is a sidebar with various navigation links: Home, Marketplace, Billing, APIs & Services, Support, IAM & admin, Getting started, Security, COMPUTE (with sub-links for App Engine, Compute Engine, Kubernetes Engine, Cloud Functions, and Cloud Run), and STORAGE.



# Creating a new project

The screenshot shows the Google Cloud Platform Dashboard. On the left is a navigation sidebar with links like Home, Marketplace, Billing, APIs & Services, Support, IAM & admin, Getting started, and Security. Below these are sections for COMPUTE (App Engine, Compute Engine, Kubernetes Engine, Cloud Functions, Cloud Run) and STORAGE. The main content area is titled 'Dashboard' and contains a message: 'To view this page, select a project.' At the bottom right of this message is a 'SELECT' button and a larger 'CREATE' button. A blue arrow points from the text 'Create a new project by clicking here' to the 'CREATE' button.

To view this page, select a project.

SELECT CREATE

Create a new project by clicking here



# Creating a new project

Type in a project name and press Create

New Project – Google Cloud Plat x +

https://console.cloud.google.com/projectcreate?previousPage=%2Fprojectselector%2Fhome%2Fdashboard

Google Cloud Platform

New Project

Project name \*

My Project 83104

Project ID: advance-river-249607. It cannot be changed later. [EDIT](#)

Organization \*

xxcelerate.co

Select an organization to attach it to a project. This selection can't be changed later.

Location \*

xxcelerate.co [BROWSE](#)

Parent organization or folder

[CREATE](#) [CANCEL](#)



# Creating a new project

It will redirect you to this window, the Google Cloud Platform (GCP) Console

The screenshot shows the GCP console dashboard for a project named "My Project 83104". The left sidebar contains links for Home, Marketplace, Billing, APIs & Services, Support, IAM & admin, Getting started, Security, Compute, App Engine, Compute Engine, Kubernetes Engine, Cloud Functions, Cloud Run, and Getting Started. The main area displays the project details: Project ID (my-project-83104), Project number (564109382284), and a section to "ADD PEOPLE TO THIS PROJECT". It also features a timeline chart showing activity from 5 PM to 5:45, with a note about a free trial status: "\$2,352.30 credit and 363 days remaining". To the right, there are sections for Cloud status, Billing (estimated charges \$0.00), Error Reporting (no errors), and News (last month's news). A "CUSTOMIZE" button is located in the top right corner of the dashboard area.



## Enable billing

Next, we need to enable the billing. The steps are outlined here, under *Enable billing for a project*:

<https://cloud.google.com/billing/docs/how-to/manage-billing-account>



# Enable API

Now, we need to enable the BigQuery API for our project. Go this link:

<https://console.cloud.google.com/flows/enableapi?apiid=bigquery> and the

window below will appear. Choose your created project and press Continue

Enable an API - Google Cloud Platform

https://console.cloud.google.com/flows/enableapi?apiid=bigquery

Google Cloud Platform Select a project

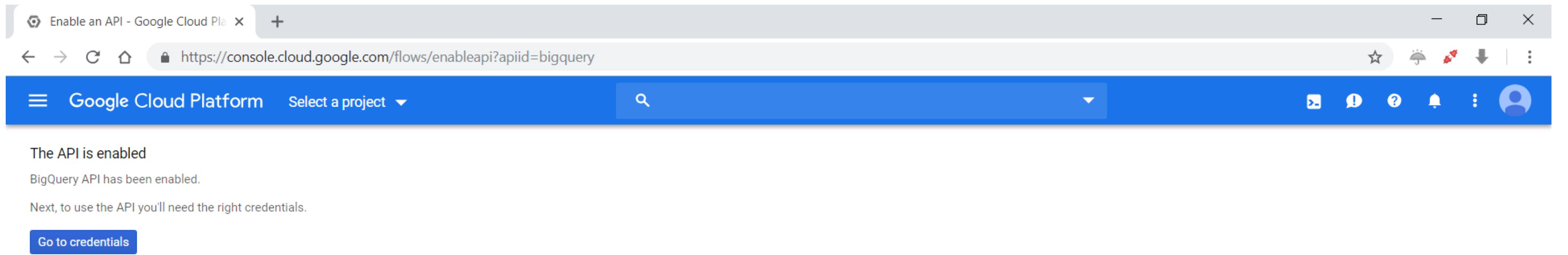
Create a project

Continue



# Enable API

You should see this screen if enabling is successful:



The screenshot shows a browser window for the Google Cloud Platform. The title bar says "Enable an API - Google Cloud Pla" and the address bar shows the URL "https://console.cloud.google.com/flows/enableapi?apiid=bigquery". The main content area has a blue header with "Google Cloud Platform" and "Select a project". Below the header, a message says "The API is enabled" and "BigQuery API has been enabled." A button labeled "Go to credentials" is visible. The top right of the window has standard browser controls like minimize, maximize, and close.

The API is enabled  
BigQuery API has been enabled.  
Next, to use the API you'll need the right credentials.  
[Go to credentials](#)



# Accessing BigQuery web UI

Access the BigQuery web UI through this link:

<https://console.cloud.google.com/bigquery>



# CREATING DATASETS AND TABLES IN BIGQUERY



# Accessing BigQuery web UI

Access the BigQuery web UI through this link:  
<https://console.cloud.google.com/bigquery>

The screenshot shows the Google Cloud Platform BigQuery web interface. At the top, there's a navigation bar with tabs for 'BigQuery - My Project 83104' and 'Home - My Project 83104'. The main content area has a blue header bar with the 'Google Cloud Platform' logo, a search bar, and various status icons. Below this is the 'BigQuery' section, which includes a 'Query history' sidebar on the left containing links for 'Saved queries', 'Job history', 'Transfers', 'Scheduled queries', and 'BI Engine'. The main 'Query editor' pane is currently empty, showing the number '1' in the top-left corner. At the bottom of the editor pane, there are buttons for 'Run', 'Save query', 'Save view', 'Schedule query', and 'More'. The bottom right corner of the slide shows a small circular progress bar.



# Resources

The screenshot shows the Google Cloud Platform BigQuery interface. At the top, there are two tabs: "BigQuery - My Project 83104 - Go" and "Home - My Project 83104 - Goo". The URL in the address bar is <https://console.cloud.google.com/bigquery?project=my-project-83104&folder&organizationId=688394793117>. A notification bar at the top indicates a free trial status with "\$2,352.30 credit and 363 days remaining" and buttons for "DISMISS" and "ACTIVATE". The main navigation bar includes "Google Cloud Platform", "My Project 83104", a search bar, and various icons for notifications and user profile.

The left sidebar is titled "Query history" and contains links for "Saved queries", "Job history", "Transfers", "Scheduled queries", "BI Engine", "Resources", and a search bar. Below the sidebar, two projects are listed: "my-project-83104" and "bigquery-ml-249309". A blue arrow points from the text "In the Resources tab, select the project you want to create a dataset in" to the "bigquery-ml-249309" link.

The main area is the "Query editor". It features a "Query history" section with a "REFRESH" button, a "Personal history" section, and a query composition area with "Run", "Save query", "Save view", "Schedule query", and "More" buttons. A message at the bottom of the editor says, "Did you know BigQuery offers a Free Tier for 1 TB of querying per month and 10 GB of storage?" with "Dismiss" and "Learn more" buttons. The status bar at the bottom right says "No queries yet" and "Compose a query to get started".

In the center of the main area, the text "In the Resources tab, select the project you want to create a dataset in" is displayed in large, bold, black font.



# Creating a new dataset

The screenshot shows the Google Cloud Platform BigQuery interface. On the left, the 'Resources' sidebar lists 'my-project-83104' and 'bigquery-ml-249309'. The 'bigquery-ml-249309' project is selected, showing its datasets like 'bqml\_tutorial'. The main area is the 'Query editor' with a single row labeled '1'. At the bottom right of the editor, there is a 'CREATE DATASET' button. A large, bold text overlay 'Click here to create the dataset' is positioned over the 'CREATE DATASET' button, with a curved arrow pointing towards it from the right side of the screen.

BigQuery - My Project 83104 - Go Home – My Project 83104 – Go +

https://console.cloud.google.com/bigquery?project=my-project-83104&folder&organizationId=688394793117&p=bigquery-ml-249309&page=project

DISMISS ACTIVATE

Google Cloud Platform My Project 83104

BigQuery FEATURES & INFO SHORTCUTS COMPOSE NEW QUERY

Query history Saved queries Job history Transfers Scheduled queries BI Engine Resources + ADD DATA

Search for your tables and datasets

my-project-83104

bigquery-ml-249309

bqml\_tutorial

Run Save query Save view Schedule query More

bigquery-ml-249309

CREATE DATASET UNPIN PROJECT

Datasets and tables available

Use the Resources tree to view your data, or create a new dataset using the controls above



# Creating a new dataset

Input dataset ID and press Create dataset

The screenshot shows the Google Cloud Platform BigQuery interface. On the left, there's a sidebar with options like Query history, Saved queries, Job history, Transfers, Scheduled queries, BI Engine, and Resources. The Resources section is expanded, showing 'my-project-83104' and 'bigquery-ml-249309'. Under 'bigquery-ml-249309', there's a 'bqml\_tutorial' dataset. The main area is titled 'Query editor' and shows a single row with the number '1'. To the right of the editor, a 'Create dataset' dialog box is open. It has fields for 'Dataset ID' (set to 'sample'), 'Data location (Optional)' (set to 'Default'), and 'Default table expiration' (radio button selected for 'Never'). At the bottom of the dialog are 'Create dataset' and 'Cancel' buttons.



# Creating a new dataset

You should see your newly-created dataset in Resources under your project:

The screenshot shows the 'Resources' section of the Google Cloud Platform web interface. At the top, there is a search bar with the placeholder 'Search for your tables and datasets' and a help icon. To the right of the search bar is a blue button labeled '+ ADD DATA ▾'. Below the search bar, a list of datasets is displayed. The first dataset, 'my-project-83104', is expanded, showing its contents: 'sample' and 'bigquery-ml-249309'. The 'sample' dataset has a small grid icon next to it. The 'bigquery-ml-249309' dataset has a small pinned note icon next to it.

Dataset	Description
my-project-83104	sample bigquery-ml-249309



# Creating a new table

Click your newly-created dataset and there should be a Create table option for it

BigQuery - My Project 83104 - G Home - My Project 83104 - Go https://console.cloud.google.com/bigquery?project=my-project-83104&folder&organizationId=688394793117&p=bqml\_tutorial&d=sample&page=dataset

Free trial status: \$2,352.30 credit and 363 days remaining - with a full account, you'll get unlimited access to all of Google Cloud Platform.

DISMISS ACTIVATE

Google Cloud Platform My Project 83104 + COMPOSE NEW QUERY

BigQuery FEATURES & INFO SHORTCUTS

Query history Saved queries Job history Transfers Scheduled queries BI Engine Resources + ADD DATA

Search for your tables and datasets

my-project-83104

bqml\_tutorial sample

bigquery-ml-249309:sample

Run Save query Save view Schedule query More

CREATE TABLE SHARE DATASET DELETE DATASET

Description None Labels None

Dataset info

Dataset ID	bigquery-ml-249309:sample
Created	Aug 12, 2019, 5:06:17 PM
Default table expiration	Never

59



# Creating a new table

This will take you to the table creation window where you will need to specify different settings for your table. Once you're done, click Create table

The screenshot shows the Google Cloud Platform BigQuery interface. On the left, the sidebar displays 'my-project-83104' and 'bigquery-ml-249309' datasets. The 'bigquery-ml-249309' dataset is expanded, showing 'bqml\_tutorial' and 'sample' tables. The 'sample' table is currently selected. The main area is the 'Query editor' with a single row of data. A 'Create table' dialog box is open over the editor. The dialog has several sections:

- Source**: 'Create table from:' dropdown set to 'Empty table'.
- Destination**: 'Project name' dropdown set to 'bigquery-ml', 'Dataset name' dropdown set to 'sample', and 'Table type' dropdown set to 'Native table'.
- Table name**: Input field containing 'Letters, numbers, and underscores allowed'.
- Schema**: A section with a 'Edit as text' toggle switch and a 'Add field' button.
- Partition and cluster settings**: 'Partitioning:' dropdown set to 'No partitioning'.
- Clustering order (optional)**: A note stating 'Clustering order determines the sort order of the data. Clustering can only be used on a partitioned table, and works with tables partitioned either by column or ingestion time.' Below is an input field for 'Comma-separated list of fields to define clustering order (up to 4)'.

At the bottom right of the dialog are 'Create table' and 'Cancel' buttons.



# LOADING LOCAL DATA TO BIGQUERY



# Accessing BigQuery web UI

Access the BigQuery web UI through this link:  
<https://console.cloud.google.com/bigquery>

The screenshot shows the Google Cloud Platform BigQuery web interface. At the top, there are two tabs: "BigQuery - My Project 83104" and "Home - My Project 83104". The URL in the address bar is <https://console.cloud.google.com/bigquery?project=my-project-83104&folder&organizationId=688394793117>. A promotional banner for a free trial is visible, with "DISMISS" and "ACTIVATE" buttons.

The main navigation bar includes links for "Google Cloud Platform", "My Project 83104", a search bar, and user account options.

The left sidebar, titled "Query history", contains links for "Saved queries", "Job history", "Transfers", "Scheduled queries", and "BI Engine". It also features a "Resources" section with a "+ ADD DATA" button and a search bar for tables and datasets. Two projects are listed: "my-project-83104" and "bigquery-ml-249309".

The central "Query editor" area is currently empty, showing the number "1" in the top-left corner. It includes buttons for "Run", "Save query", "Save view", "Schedule query", and "More".



# Creating a new table

Click on the dataset you want to upload local data in and there should be a Create table option for it

Free trial status: \$2,352.30 credit and 363 days remaining - with a full account, you'll get unlimited access to all of Google Cloud Platform.

DISMISS ACTIVATE

Google Cloud Platform My Project 83104

BigQuery FEATURES & INFO SHORTCUTS + COMPOSE NEW QUERY

Query history Saved queries Job history Transfers Scheduled queries BI Engine Resources + ADD DATA

Search for your tables and datasets

my-project-83104

bigquery-ml-249309

bqml\_tutorial sample

bigquery-ml-249309:sample

CREATE TABLE SHARE DATASET DELETE DATASET

Description None Labels None

Dataset info

Dataset ID	bigquery-ml-249309:sample
Created	Aug 12, 2019, 5:06:17 PM
Default table expiration	Never



# Upload local data

This will take you to the table creation window. In this window under Source, choose upload under *Create table from* and *Upload*. Select the file (csv) you want to upload and set the file format to the appropriate one. Make sure you input a name for the table, schema and input parameters. Once you're done, click Create table.

The screenshot shows the 'Create table' dialog box in the Google Cloud Platform BigQuery interface. The 'Source' section is set to 'Upload' with the file 'sampledata-quotation-no-commas.csv' selected and 'CSV' as the file format. The 'Destination' section specifies the project 'My Project 83104', dataset 'sample', and table 'sample\_table'. Under 'Schema', there is an 'Auto detect' checkbox and a 'Edit as text' button. A 'Partition and cluster settings' section includes a 'Partitioning' dropdown set to 'No partitioning'. At the bottom, there is a 'Clustering order (optional)' note and a 'Create table' button.



# RUNNING ANALYTIC QUERIES IN BIGQUERY



# CONNECTING TO BIGQUERY IN JUPYTER NOTEBOOK



**BIGQQUERYML**



## ADDITIONAL INFORMATION – DENORMALIZED STORAGE IN BIGQUERY

# Normalized Storage in Traditional Databases

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## Traditional Database Design

### Normalization

Minimizes redundancy,  
optimizes storage

Foreign keys to ensure  
valid joins

Updates in one location,  
no duplication of data

# Employee Information

## Employee Details

Id	Name	Department	Grade
1	Emily	Finance	6

## Employee Subordinates

Id	Subordinate Id
1	2
1	3

## Employee Address

Id	City	Zip Code
1	Palo Alto	94305
2	Seattle	98101

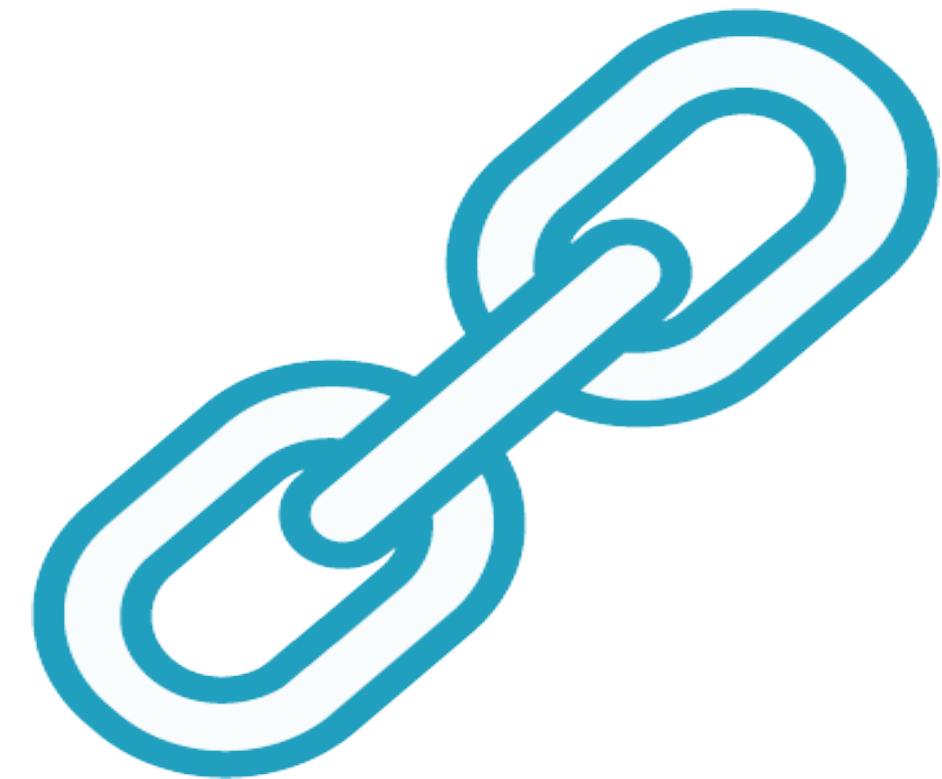


# Denormalized Storage in BigQuery

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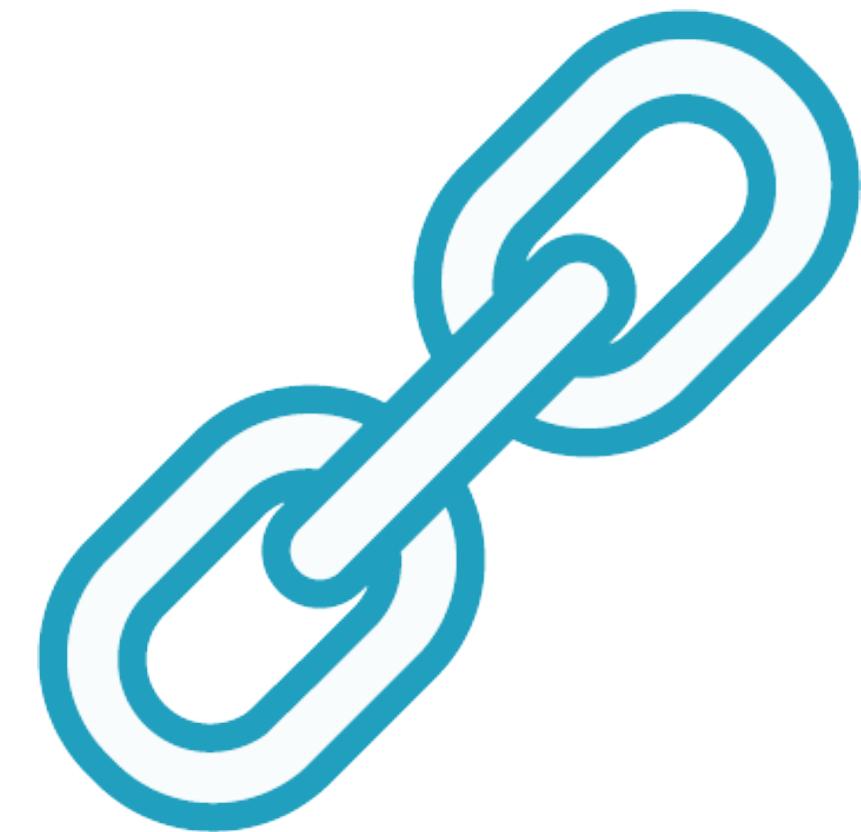


# Denormalized Storage



## Denormalized data

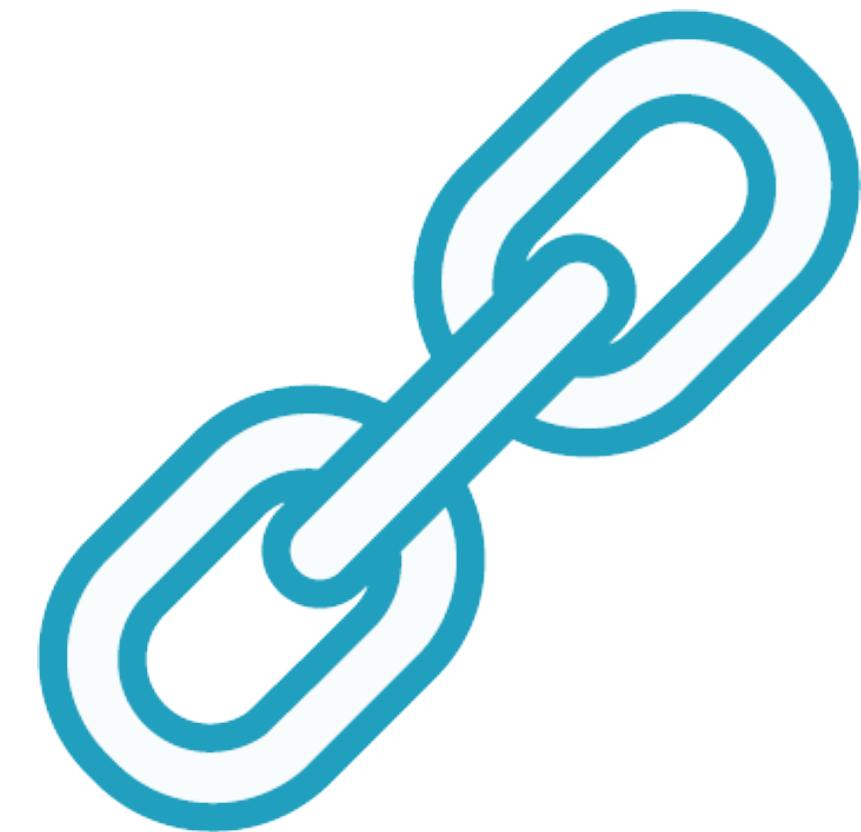
Data is compressed into one table to  
be read in a single operation



# Denormalized Storage



Disk space is very cheap  
No foreign key constraints  
Read operations, no data updates



# Denormalized Storage



Optimize the number of disk seeks

Store data for an entity in one location

Ignore redundancy, minimize joins

# Denormalized Storage



Id	Name	Function	Grade
1	Emily	Finance	6
2	John	Finance	3
3	Ben	Finance	4

Id	Subordinate Id
1	2
1	3



Id	Name	Function	Grade	Subordinates
1	Emily	Finance	6	<ARRAY>
2	John	Finance	3	
3	Ben	Finance	4	

# Denormalized Storage



Id	Name	Function	Grade
1	Emily	Finance	6
2	John	Finance	3
3	Ben	Finance	4

Id	Subordinate Id
1	2
1	3



Id	Name	Function	Grade	Subordinates
1	Emily	Finance	6	2,3
2	John	Finance	3	
3	Ben	Finance	4	

# Denormalized Storage



<b>Id</b>	<b>Name</b>	<b>Function</b>	<b>Grade</b>
1	Emily	Finance	6
2	John	Finance	3
3	Ben	Finance	4

<b>Id</b>	<b>City</b>	<b>Zip Code</b>
1	Palo Alto	94305
2	Seattle	98101



<b>Id</b>	<b>Name</b>	<b>Function</b>	<b>Grade</b>	<b>Subordinates</b>	<b>Address</b>
1	Emily	Finance	6	2,3	<STRUCT>
2	John	Finance	3		
3	Ben	Finance	4		

# Denormalized Storage



Id	Name	Function	Grade
1	Emily	Finance	6
2	John	Finance	3
3	Ben	Finance	4

Id	City	Zip Code
1	Palo Alto	94305
2	Seattle	98101



Id	Name	Function	Grade	Subordinates	Address
1	Emily	Finance	6	2,3	Palo Alto, 94305
2	John	Finance	3		
3	Ben	Finance	4		



# Denormalized Storage

Id	Name	Function	Grade	Subordinates	Address
1	Emily	Finance	6	2,3	Palo Alto, 94305
2	John	Finance	3		
3	Ben	Finance	4		

Store everything related to an employee in the same table



# Denormalized Storage

Id	Name	Function	Grade	Subordinates	Address
1	Emily	Finance	6	2,3	Palo Alto, 94305
2	John	Finance	3		
3	Ben	Finance	4		

Get all details about an  
employee in one read operation



# Google DataStudio

Interactive dashboards and reports

Connectors to GCP services and data stores

Easy to share with teams in your organization



Google BigQuery