Инструменты визуализации при работе с Большими Данными

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Структура курса

1. Введение в Большие Данные
2. Hadoop экосистема и MapReduce
3. SQL поверх больших данных
4. Инструменты визуализации при работе с Большими Данными
5. Введение в Scala
6. Модель вычислений Spark: RDD
7. Approximate алгоритмы для больших данных
8. Потоковая обработка данных (Kafka, Spark Streaming, Flink)
9. Гостевая лекция VK
10. Гостевая лекция VK

План занятия

1. Apache Zeppelin
2. Polynote
3. Big Data Tools
4. Cloud Solutions
5. Workshop

Where we are?

Big Data platform

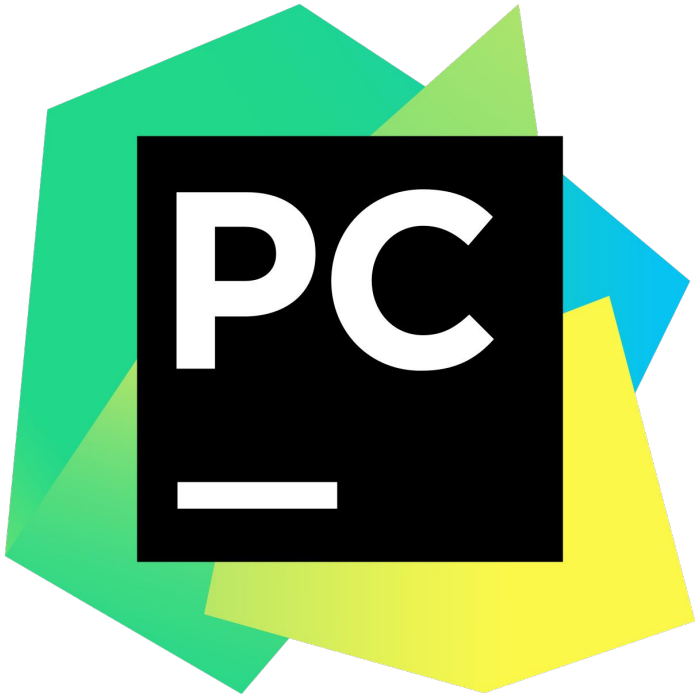
- Hadoop Distributed Filesystem (NM, DN)
- Apache Hadoop YARN (RM, NM)

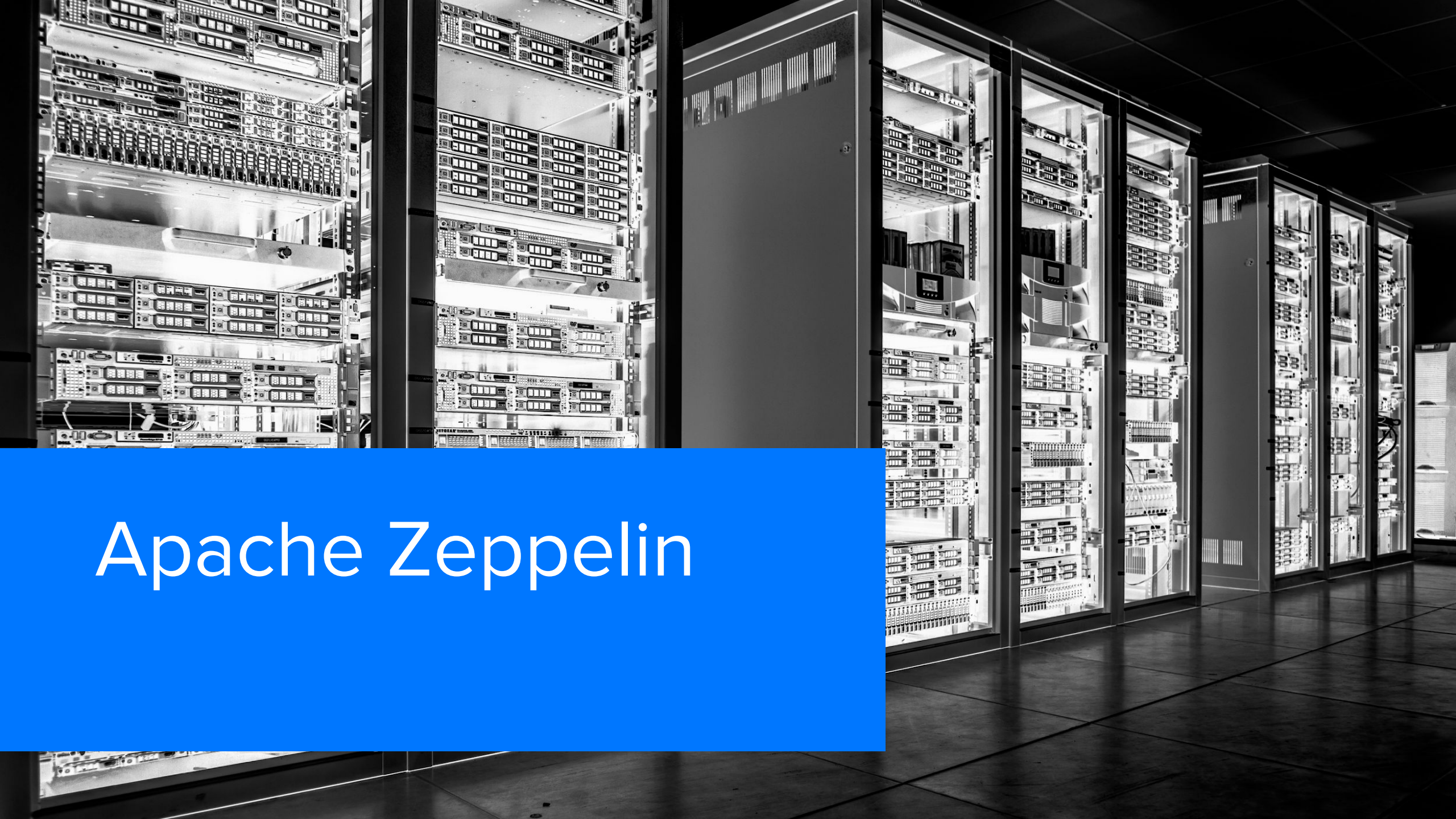
Big Data applications

- Hadoop MapReduce
- SQL-like processing frameworks
- Apache Spark
- Stream processing frameworks + Apache Kafka

→ **Tools to work with**

Classic small data stack





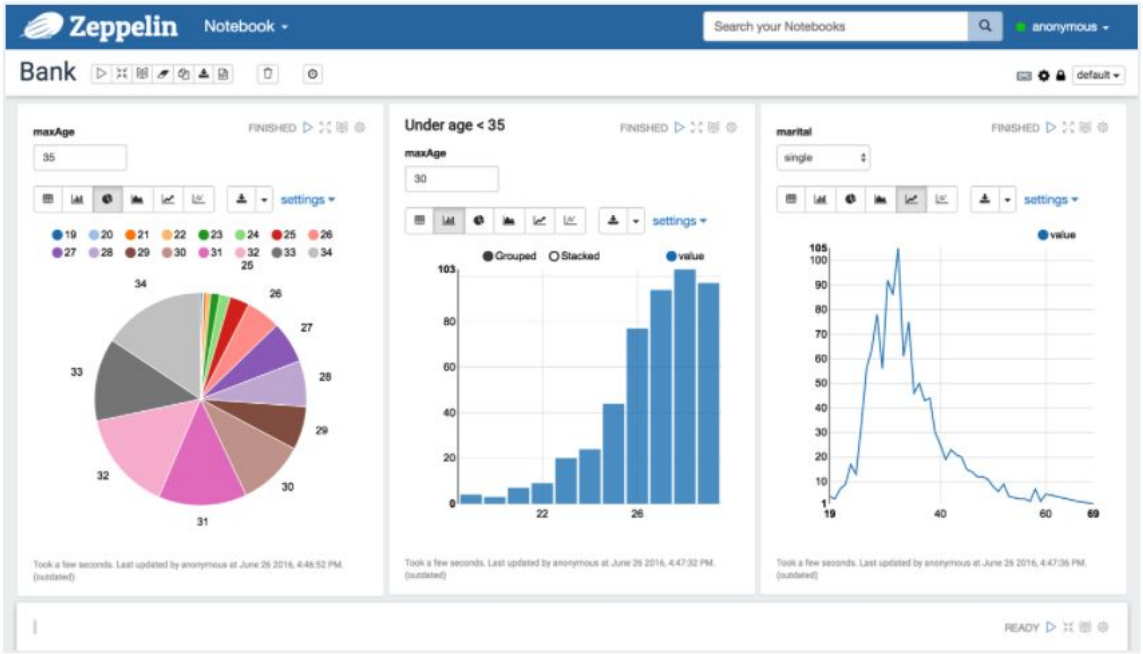
Apache Zeppelin

Apache Zeppelin in a nutshell

Multi-purpose Notebook

The Notebook is the place for all your needs

- Data Ingestion
- Data Discovery
- Data Analytics
- Data Visualization & Collaboration



Apache Zeppelin in a nutshell

- Хочет быть как jupyter notebook / jupyterlab
- умеет нативно работать со Scala/Java
- Hive/Spark удобно конфигурировать и работать
- Неплохие визуализации

Zep context. One interface to rule them all

```
%spark
// This is just for demo, it could be done via running
    a spark job
z.put("maxAge", 83)
```

FINISHED

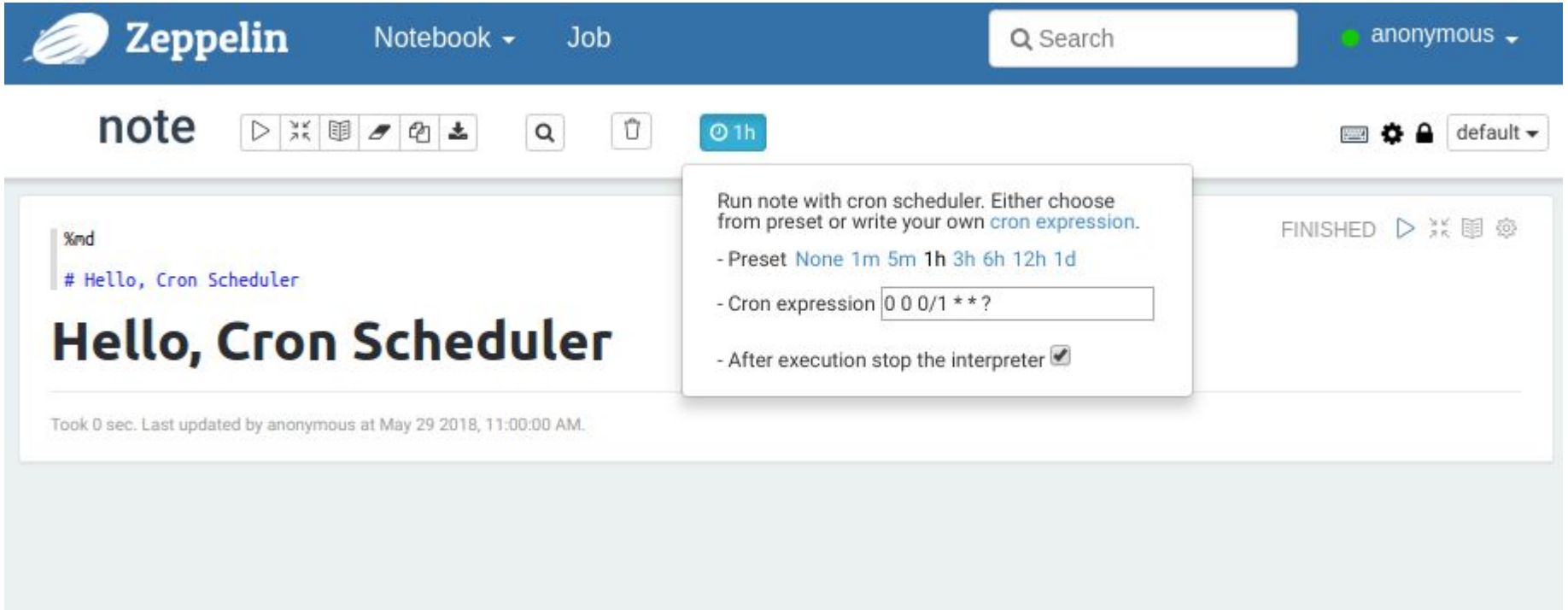
```
%jdbc(interpolate=true)
select * from bank where age = {maxAge}
```

FINISHED

settings

age	job	marital
83	retired	married
83	retired	married
83	retired	divorced
83	retired	divorced

Scheduling. Don’t try on prod!



Notebook storages

1. (default) use local file system and version it using local Git repository - GitNotebookRepo
2. all notes are saved in the notebook folder in your local File System - VFSNotebookRepo
3. all notes are saved in the notebook folder in hadoop compatible file system - FileSystemNotebookRepo
4. storage using Amazon S3 service - S3NotebookRepo
5. storage using Azure service - AzureNotebookRepo
6. storage using Google Cloud Storage - GCSNotebookRepo
7. storage using Aliyun OSS - OSSNotebookRepo
8. storage using MongoDB - MongoNotebookRepo
9. storage using GitHub - GitHubNotebookRepo

Interpreters. JDBC

- Postgresql - JDBC Driver
- Mysql - JDBC Driver
- MariaDB - JDBC Driver
- Redshift - JDBC Driver
- Apache Hive - JDBC Driver
- Presto/Trino - JDBC Driver
- Impala - JDBC Driver
- Apache Phoenix itself is a JDBC driver
- Apache Drill - JDBC Driver
- Apache Tajo - JDBC Driver

Polynote

Polynote in a nutshell

- Умеет варить объекты в одном кернели и конвертить из Scala в Python
- Сырой, но хоть какая-то альтернатива Zeppelin / Jupyter

https://polynote.org/

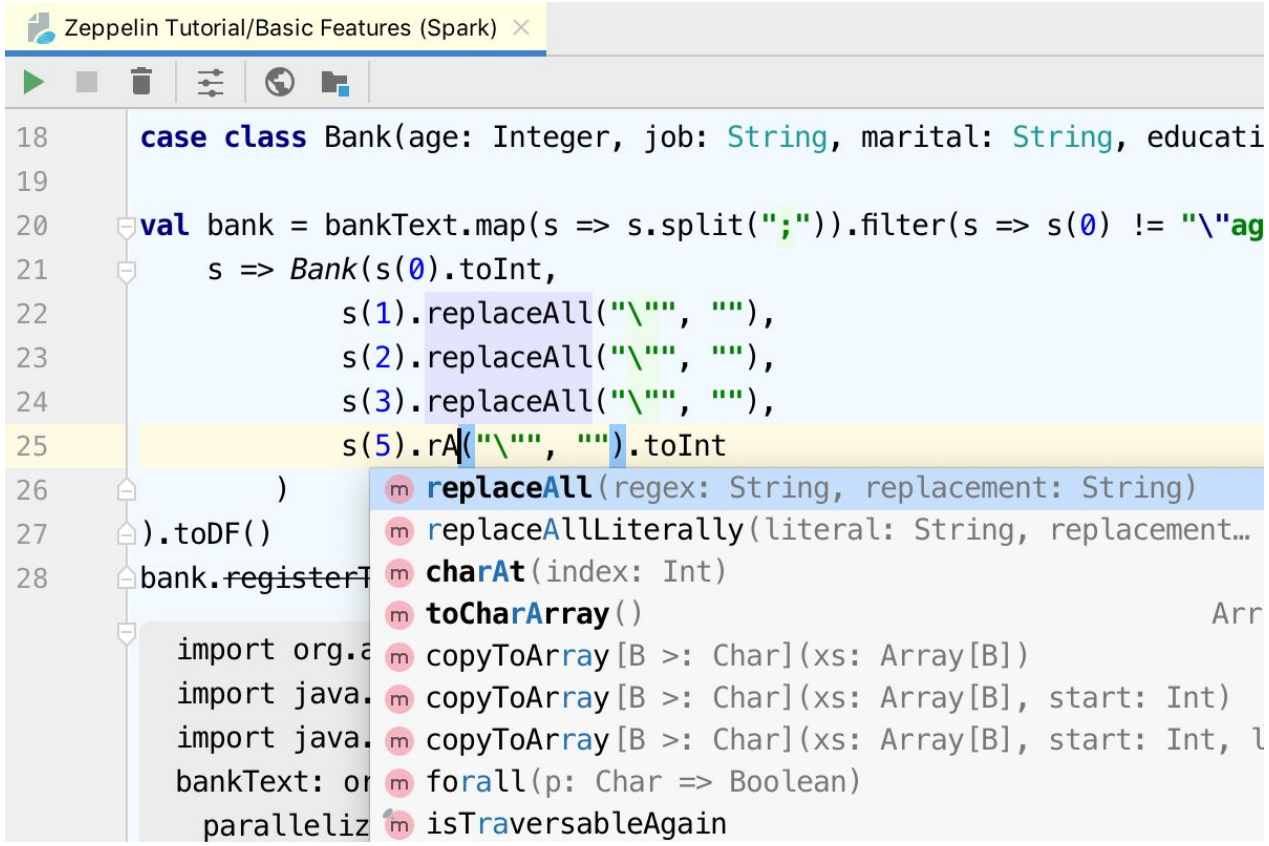
Polynote

NETFLIX | OSS

Big Data Tools

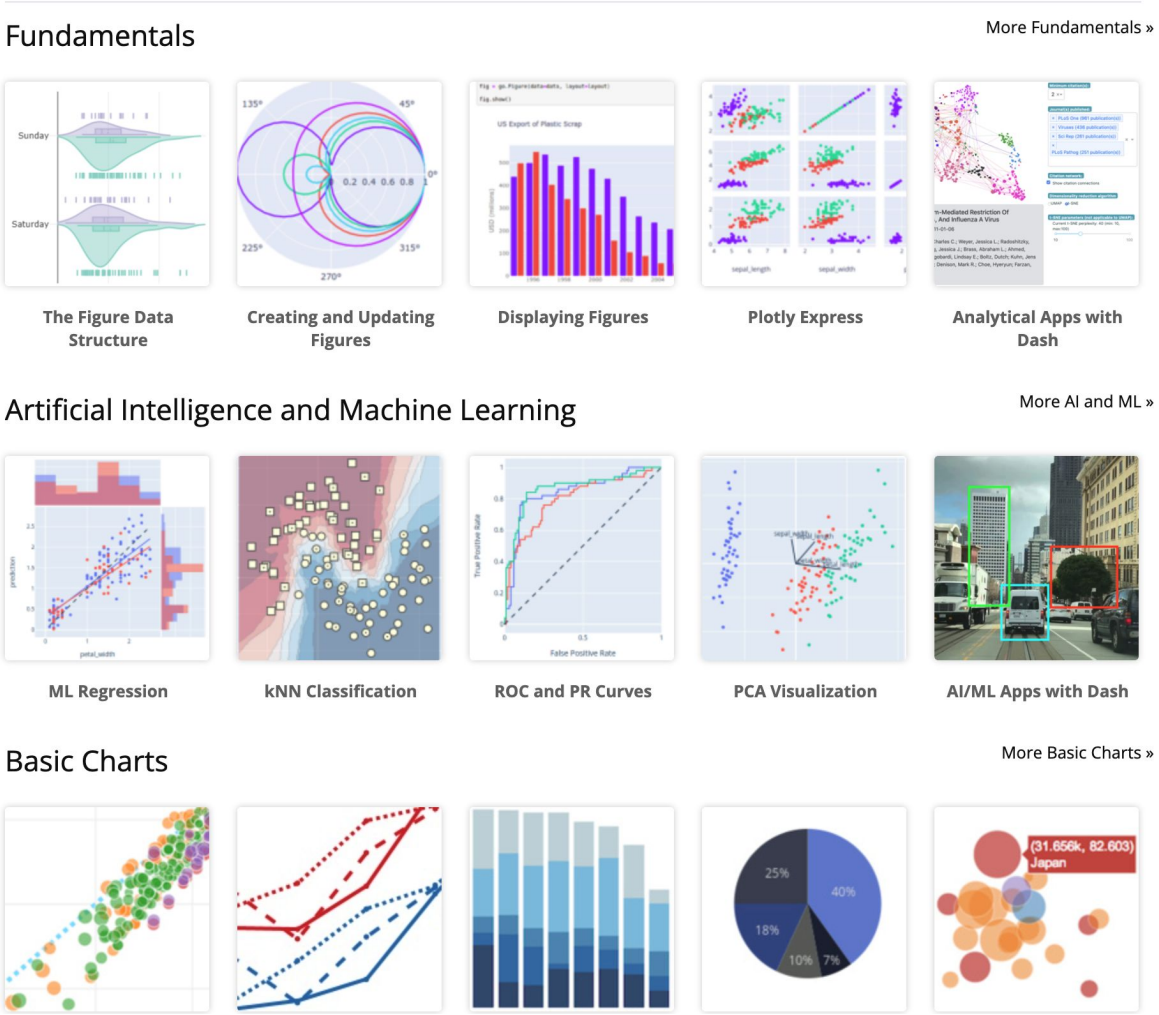
Big Data Tools in a nutshell

- Интеллектуальная поддержка Zeppelin notebooks
- Интеграция с инструментами Spark и Hadoop
- Распределенные файловые системы и столбцовые форматы
- Инструменты для работы с таблицами и диаграммами



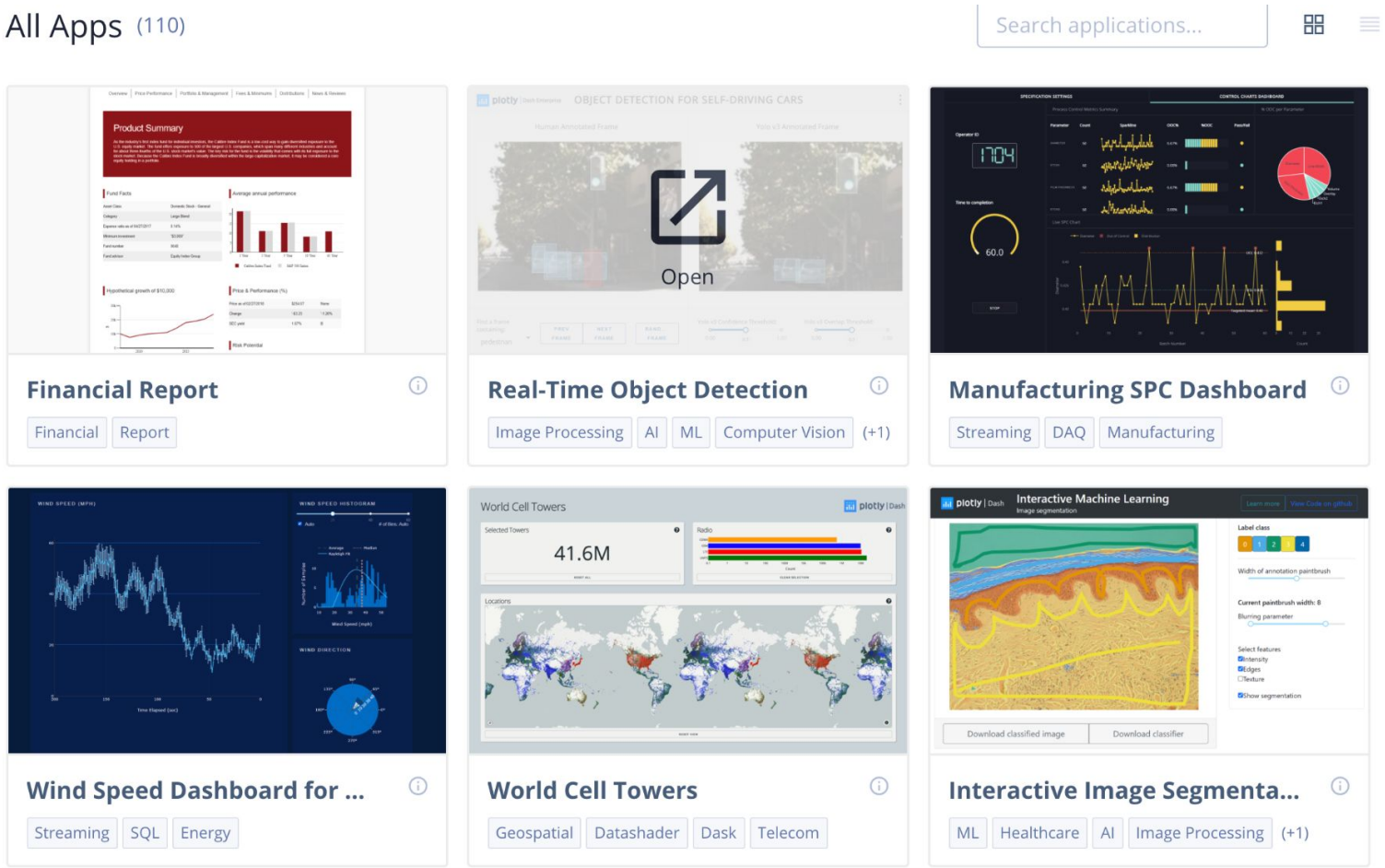
More vis tools

Plotly. Multilang vis tool



[Plotly Python Graphing Library | Python]

Dash. Visual apps at web



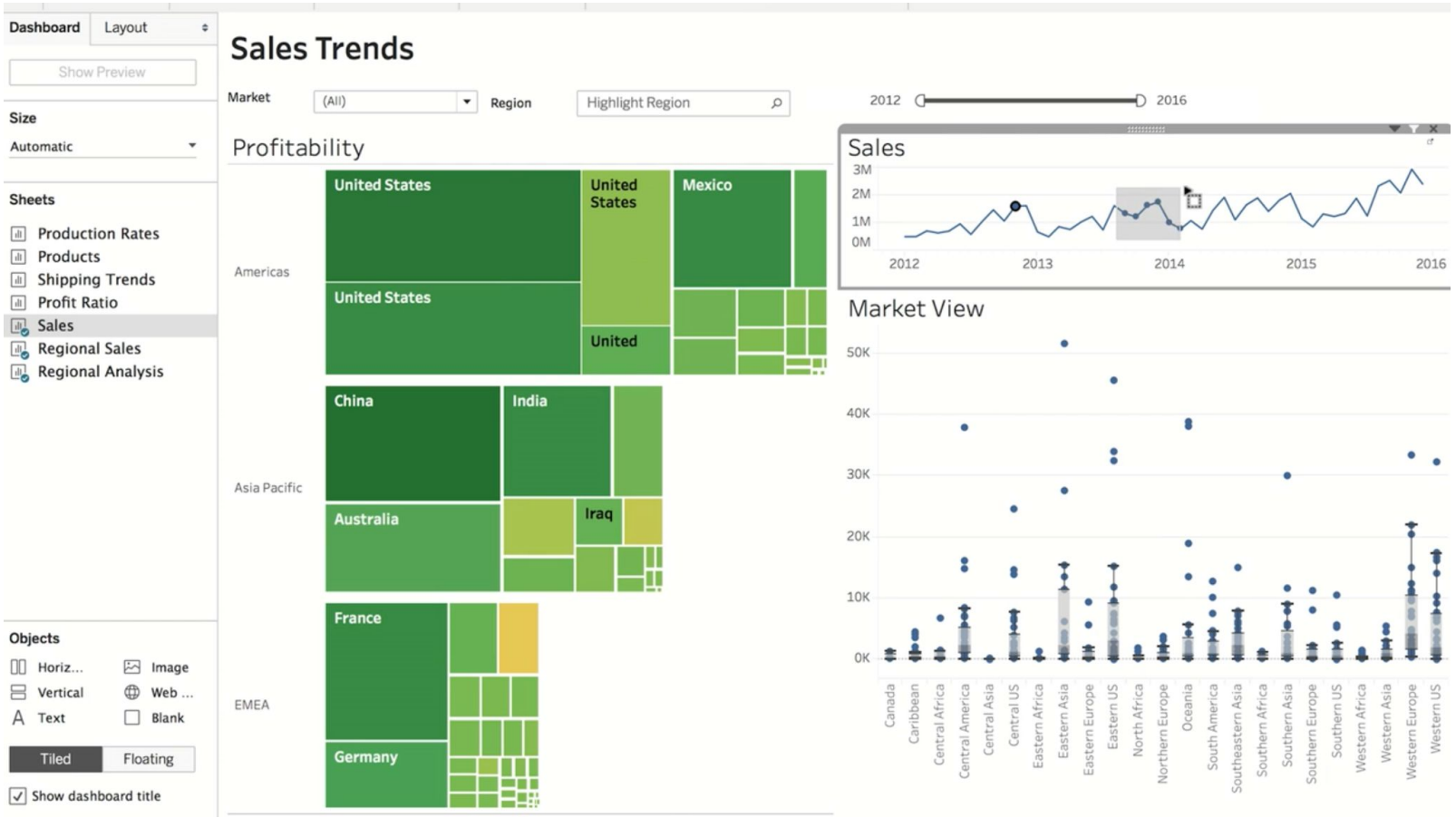
https://dash.gallery/Portal/

Tableau. Expensive industrial standart

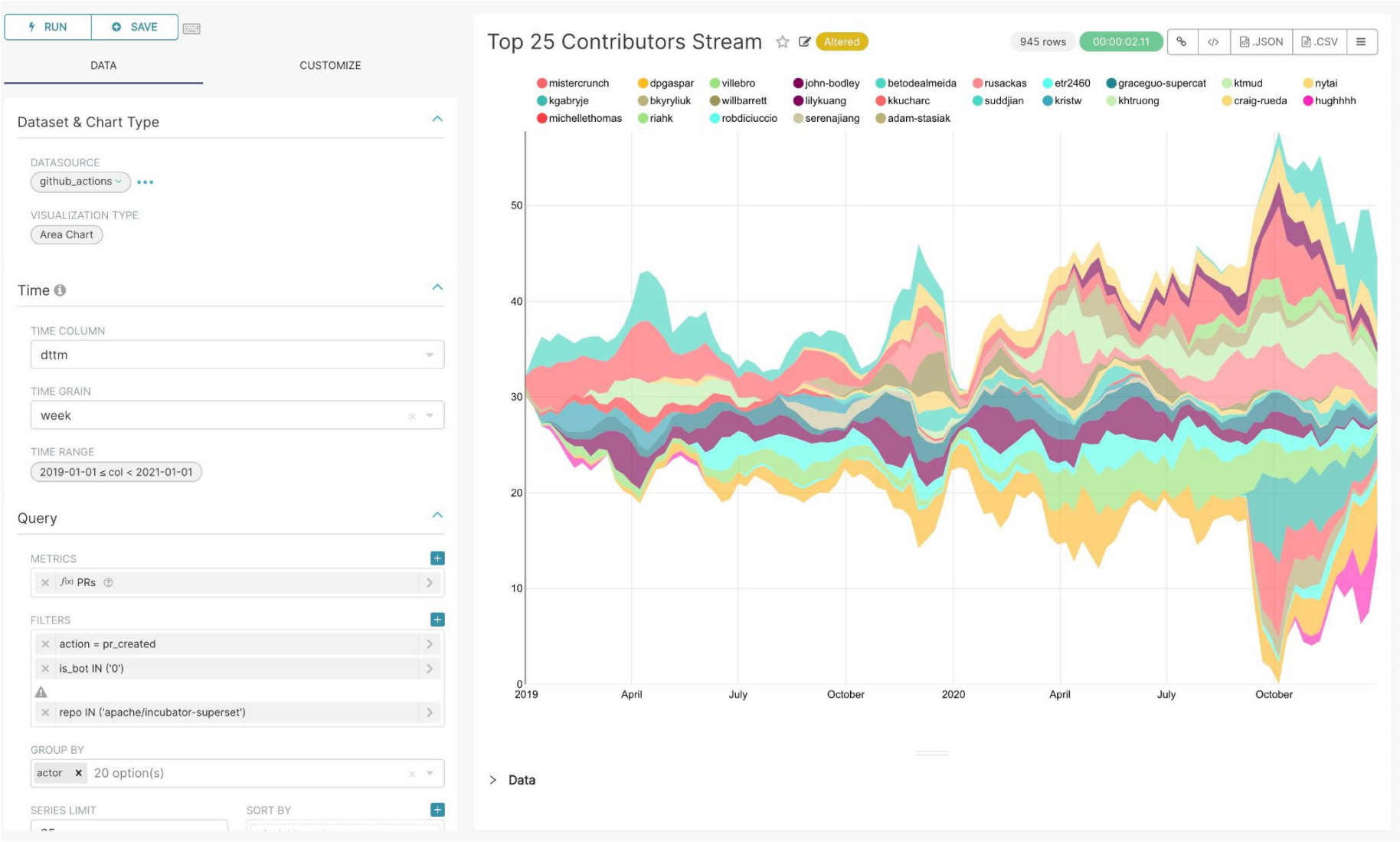
Tableau native data connectors

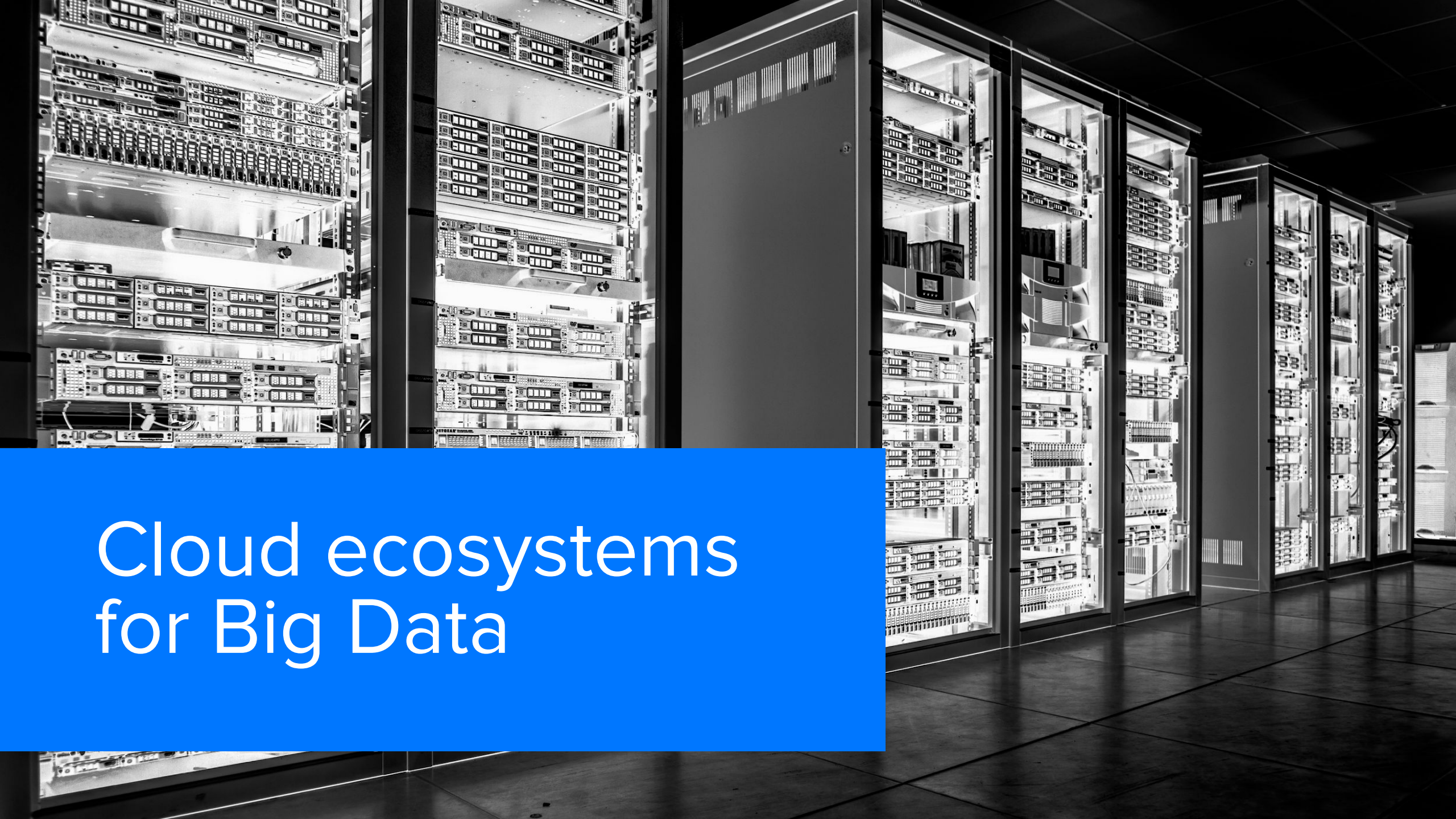
Connect to all of your data—no matter where it resides. Tableau offers native connectors built and optimized for many databases and files—from spreadsheets and PDFs to big data, cube, and relational databases on-premises or in the cloud, even application data or data on the web.

Tableau. Interface



SuperSet

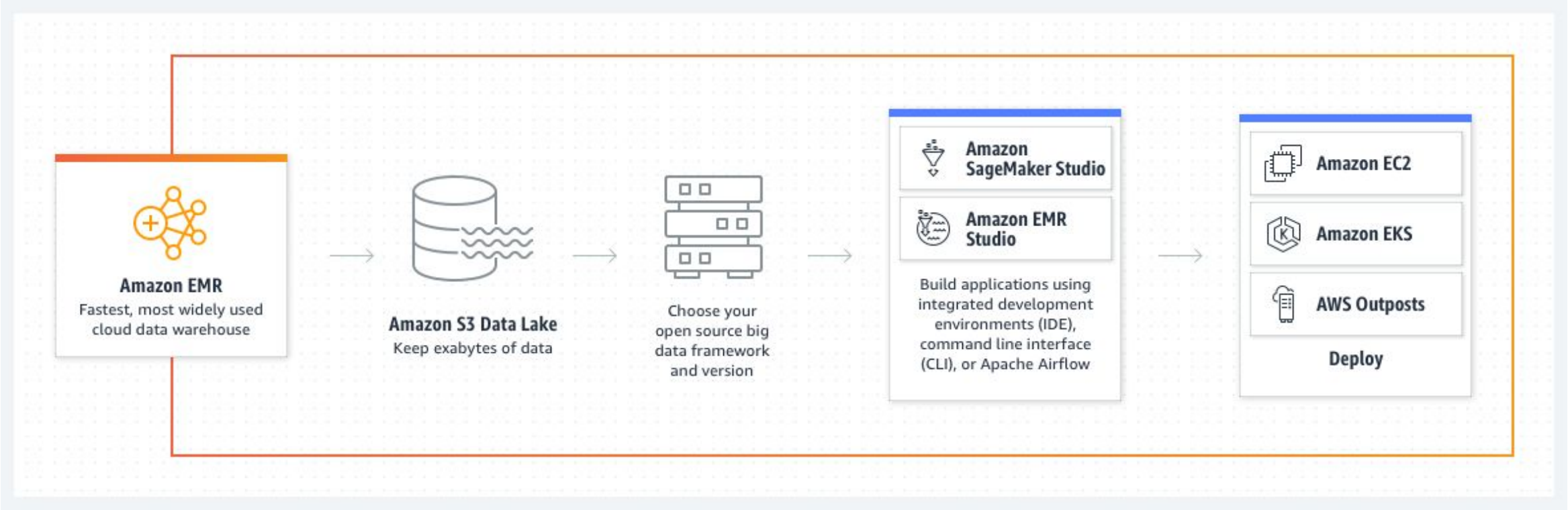

RUN
SAVE
DATA
CUSTOMIZE
Dataset & Chart Type
DATASOURCE
github_actions
VISUALIZATION TYPE
Area Chart
Time
TIME COLUMN
dttm
TIME GRAIN
week
TIME RANGE
2019-01-01 ≤ col < 2021-01-01
Query
METRICS
PRs
FILTERS
action = pr_created
is_bot IN ('0')
repo IN ('apache/incubator-superset')
GROUP BY
actor
20 option(s)
SERIES LIMIT
SORT BY
Top 25 Contributors Stream
Altered
945 rows
00:00:02.11
.JSON
.CSV
mistercrunch
dpgaspar
villebro
john-bodley
betodealmeida
rusackas
etr2460
graceguo-supercat
ktmud
nytai
kgabryje
bkyryliuk
willbarrett
lilykuang
kkucharc
suddjian
kristw
khtruong
craig-rueda
hughhhh
michellethomas
riahk
robdiciuccio
serenajiang
adam-stasiak
50
40
30
20
10
0
2019
April
July
October
2020
April
July
October
Data



Cloud ecosystems for Big Data

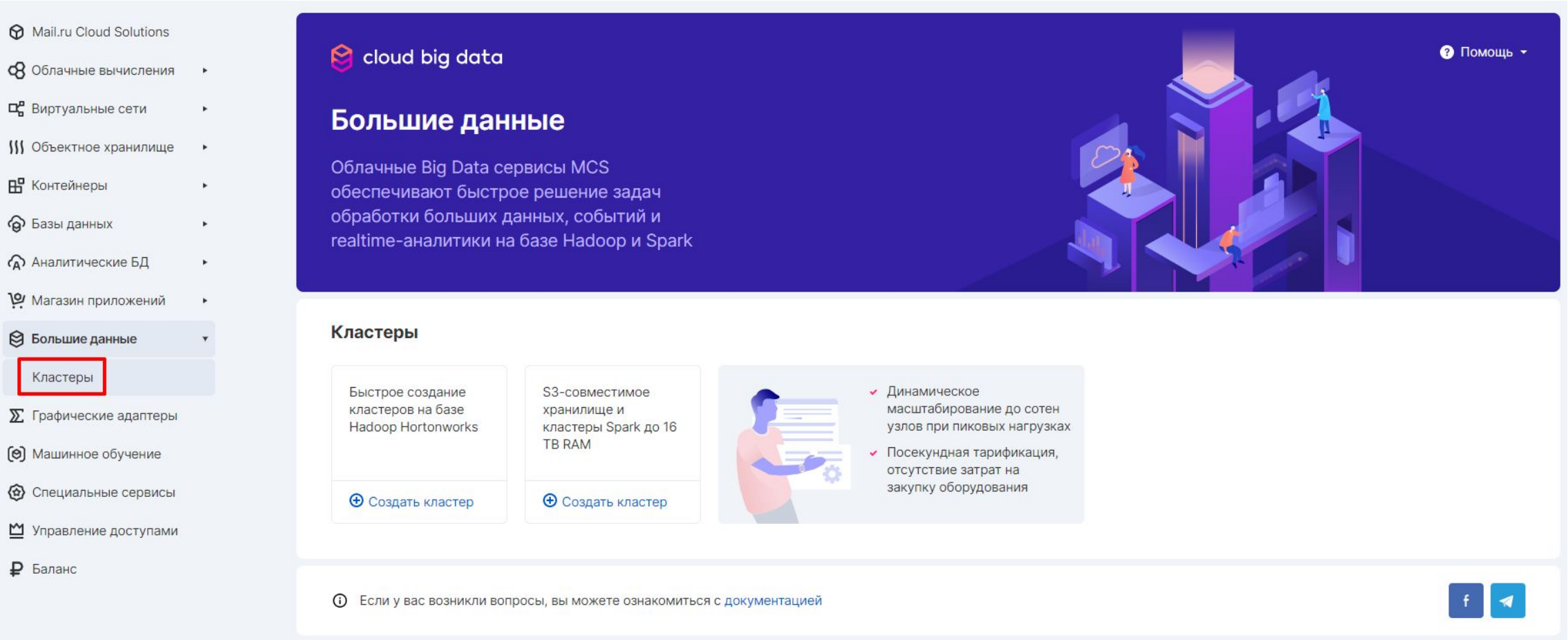
Amazon EMR

https://aws.amazon.com/ru/emr/features/?nc=sn&loc=2&dn=1



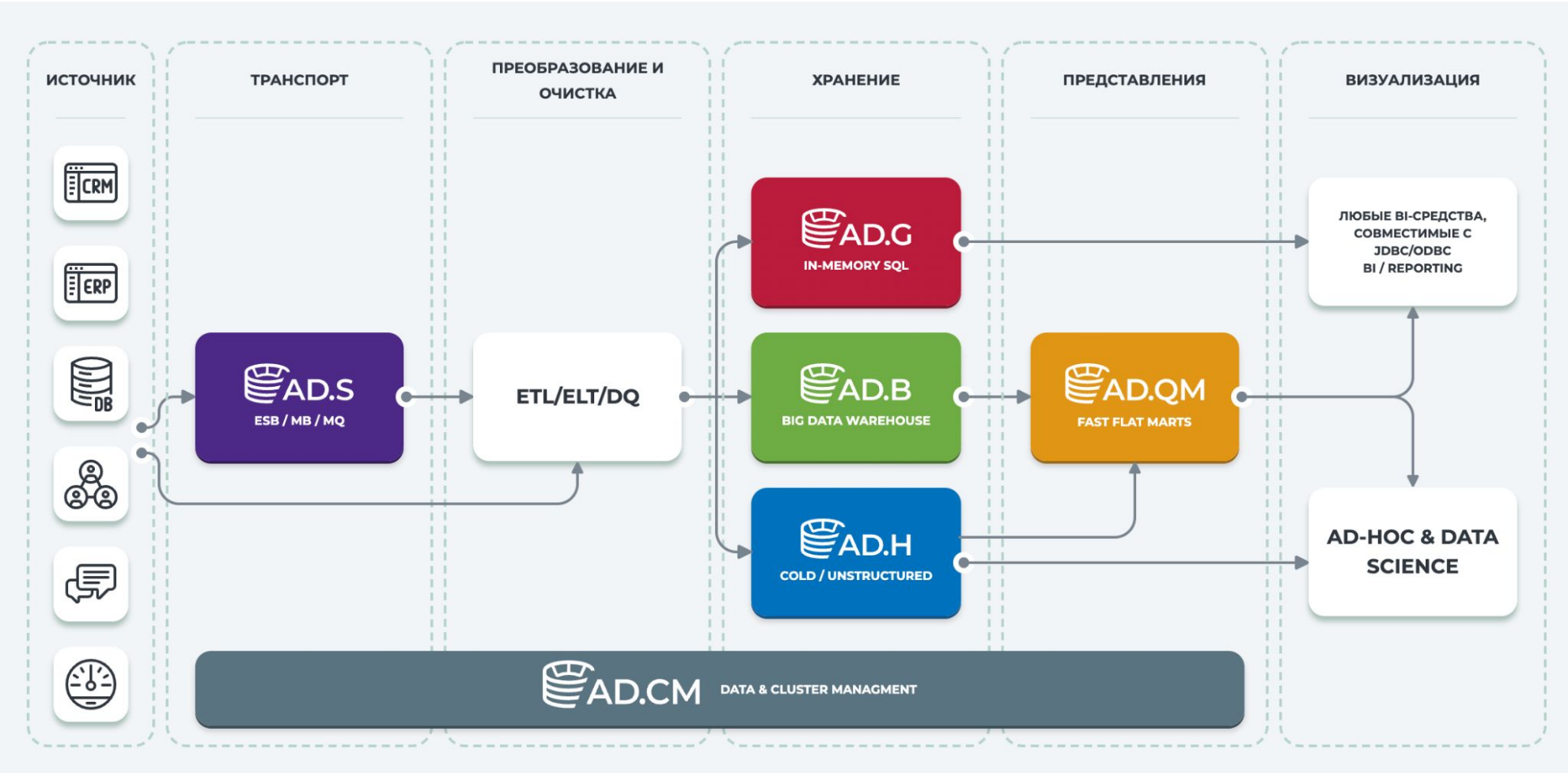
Amazon EMR – это платформа для быстрой обработки, анализа и работы с большими данными с помощью машинного обучения (ML), использующая платформы с открытым исходным кодом.

VK Cloud Solutions



ArenaData

https://arenadata.tech/



Snowflake


WHERE YOUR DATA CLOUD EXPERIENCE BEGINS:
ONE PLATFORM, MANY WORKLOADS, NO DATA SILOS
DATA ENGINEERING
DATA LAKE
DATA WAREHOUSE
DATA SCIENCE
DATA APPLICATIONS
DATA SHARING
DATA SOURCES
DATA CONSUMERS
snowflake®

Recommended links and literature

1) https://polynote.org/
2) https://zeppelin.apache.org/
3) https://docs.aws.amazon.com/emr/index.html