

# Amazon Web Services

UNDERSTANDING CLOUD COMPUTING



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# Disclaimer

## How this chapter should be understood:

- overview of **main cloud providers**
- overview of their **market position**
- overview of their respective **main services**
- overview of their **strengths**
- examples of **customers**
- **case study**

## How this chapter should *not* be understood:

- **not** an ever-lasting ground truth
- **not** an exhaustive view
- **not** a comprehensive customer analysis

# The cloud infrastructure market

## Includes

- **PaaS** (Platform as a Service) = \$32B
- **IaaS** (Infrastructure as a Service) = \$40B
- **Private cloud** = \$43B

## Does not include

- SaaS (Software as a Service)
- Cloud data centers
- Other cloud services

# AWS's position on the cloud infrastructure market



- Q4 2019 market share: **32.4%**
- Q4 2019 revenue: **\$9.8B**
- Annual growth: **33.2%**

# AWS cloud services

*Personal cloud*

Amazon drive



# AWS cloud services

*Personal cloud*

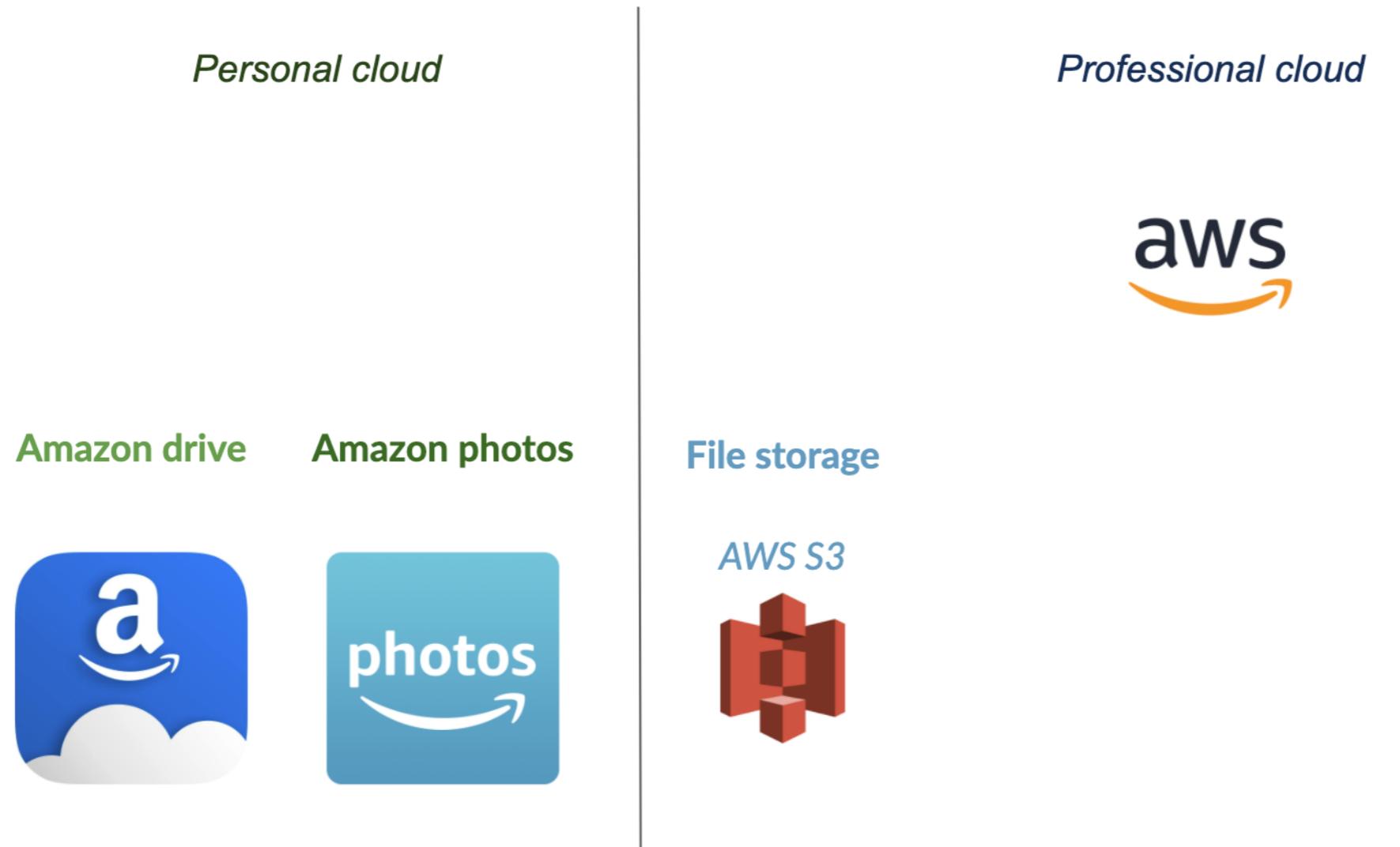
Amazon drive



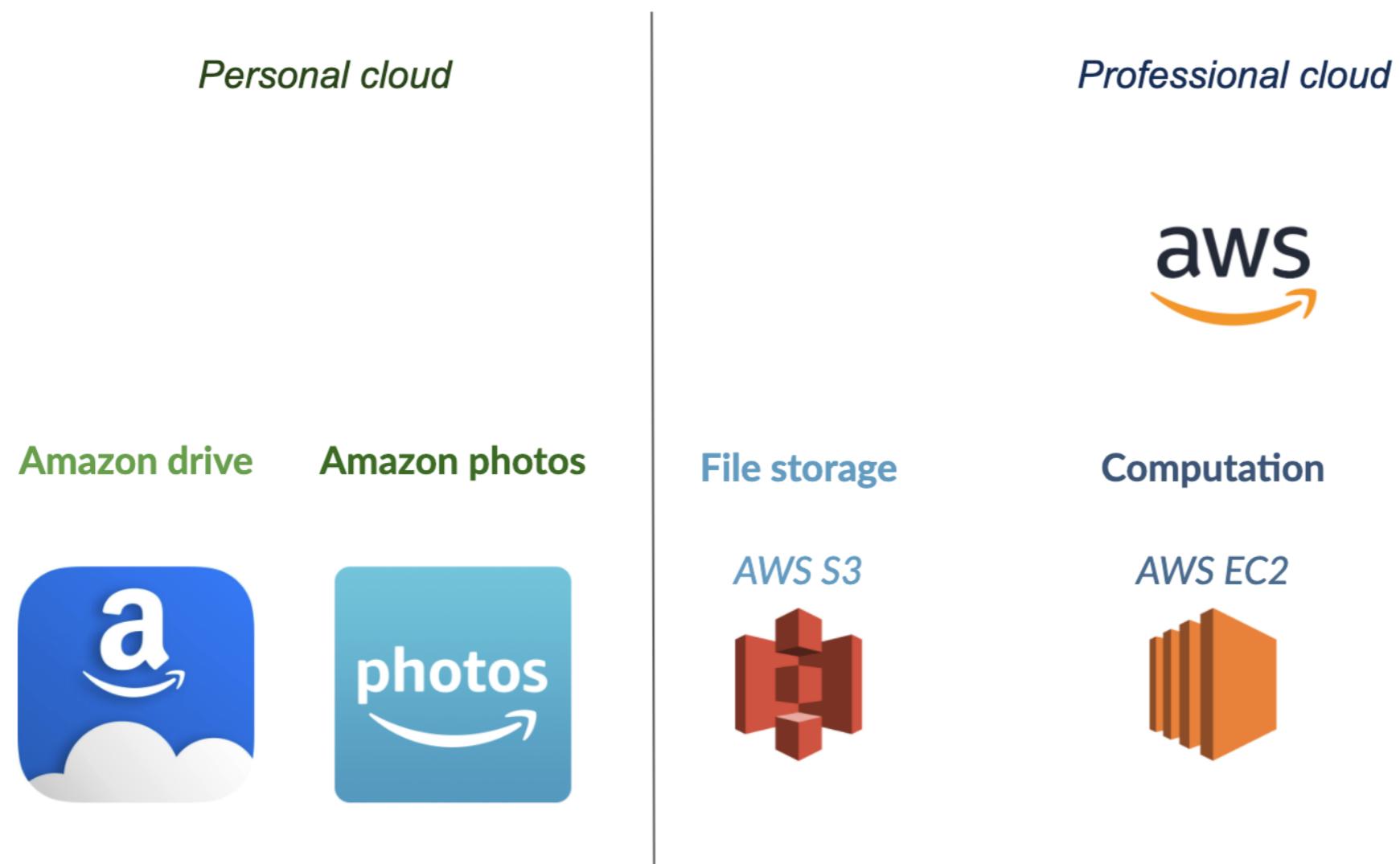
Amazon photos



# AWS cloud services



# AWS cloud services



# AWS cloud services



# AWS data services

- **Redshift** (analytics - data warehousing)
- **Kinesis** (real time data movement and analytics)
- **SageMaker** (predictive analytics and machine learning)

# AWS' strength

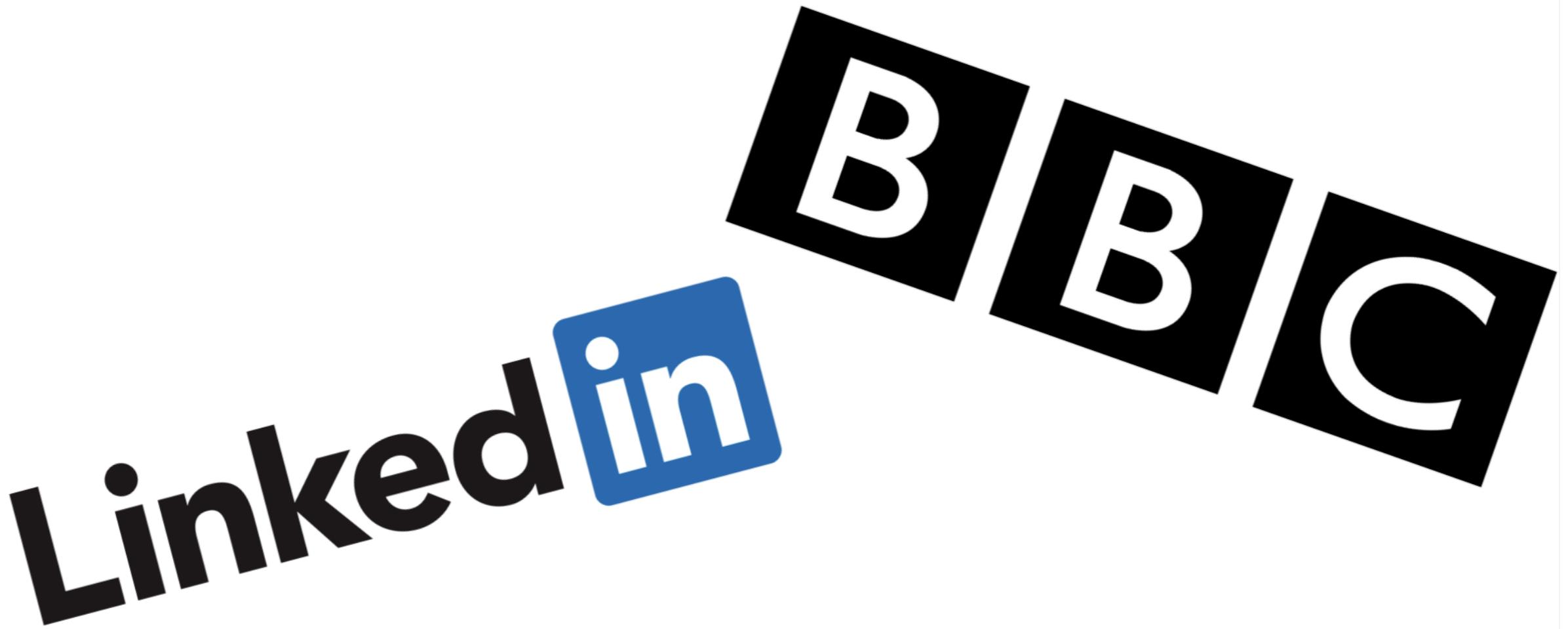
## First mover

- AWS launched in **2006** (Google Cloud in **2008**, Microsoft Azure in **2010**)  
--> breadth of services (computing, storage, databases, analytics, networking, mobile, developer tools, management tools, IoT, security and enterprise applications, analytics, machine learning or robotics)

# AWS customers



# AWS customers



# AWS customers



# AWS case study

**Company:** NerdWallet

**Problem:** Takes too long to deploy machine learning models

**Solution:**

- Amazon Sagemaker (cloud machine learning platform gathering machine learning processes)



# AWS case study

## Improvements:

- Reduce training times to days
- Reduce training costs by 75%
- Modernized data science engineering practices



nerdwallet<sup>TM</sup>

<sup>1</sup> <https://aws.amazon.com/solutions/case-studies/>

# **Let's practice!**

**UNDERSTANDING CLOUD COMPUTING**

# Microsoft Azure

## UNDERSTANDING CLOUD COMPUTING



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# Azure's position on the cloud infrastructure market



Microsoft Azure

- Q4 2019 market share: **17.6%**
- Q4 2019 revenue: **\$5.3B**
- Annual growth: **62.3%**

# Azure cloud services

*Personal cloud*

OneDrive



# Azure cloud services

*Personal cloud*

OneDrive



*Professional cloud*



File storage

Azure  
Blob Storage



# Azure cloud services

*Personal cloud*

OneDrive



*Professional cloud*



File storage

Azure  
Blob Storage



Computation

Azure  
Virtual Machines



# Azure cloud services

*Personal cloud*

OneDrive



*Professional cloud*



File storage

Azure  
Blob Storage



Computation

Azure  
Virtual Machines



Databases

Azure  
SQL Database



# Azure's data services

- **Data Lake Storage** (store data before cleaning)
- **Stream Analytics** (real-time analytics)
- **Machine Learning** (train and deploy machine learning models)

# Azure's strength

## Integration

- Integration with Microsoft products
- > benefits from customer loyalty, top-of-mind choice

# Azure customers



# Azure customers



# Azure customers



# Azure case study

**Organization:** Ottawa Hospital

**Needs:** Cost effective and secure disaster recovery solution (continue vital operations after a disaster)

**Solution:**

- Microsoft IaaS (secure, scalable environment)
- Azure Storage (medical imaging data)
- Azure Site Recovery (automatically deploy recovery processes)



# Azure case study

## Improvements:

- New secure, up-to-date, policy compliant disaster recovery site in under 3 months
- Compliant with data privacy regulations
- Saved ~50% on disaster recovery costs



<sup>1</sup> <https://customers.microsoft.com/>

# **Let's practice!**

**UNDERSTANDING CLOUD COMPUTING**

# Google Cloud

## UNDERSTANDING CLOUD COMPUTING



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# Google Cloud's position on the cloud infrastructure market



Google Cloud

- Q4 2019 market share: **6%**
- Q4 2019 revenue: **\$1.8B**
- Annual growth: **67.6%**

# Google Cloud services

*Personal cloud*

Google Drive



# Google Cloud services

*Personal cloud*

Google Drive



Google Photos



# Google Cloud services

*Personal cloud*

Google Drive



Google Photos



*Professional cloud*



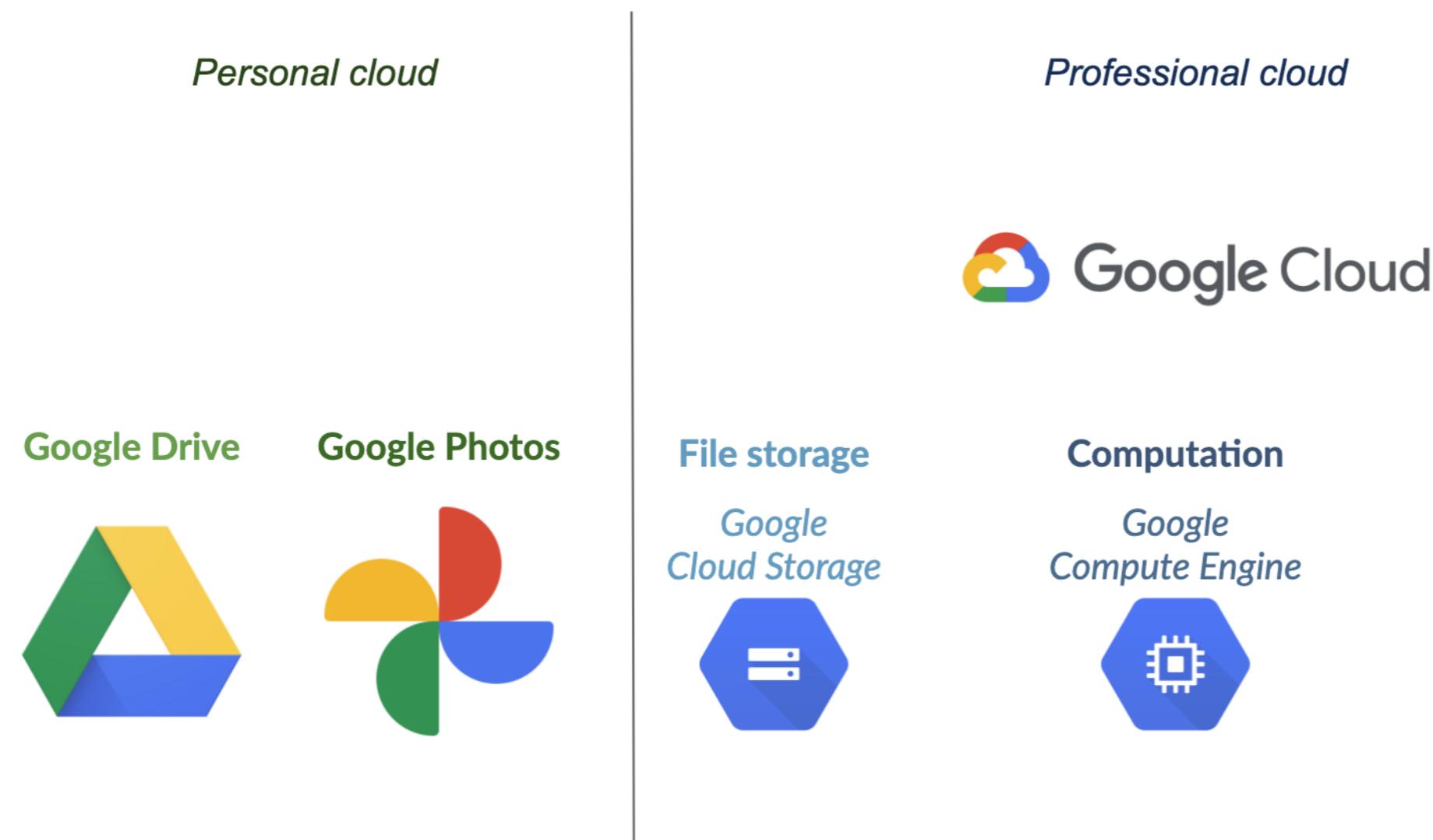
Google Cloud

File storage

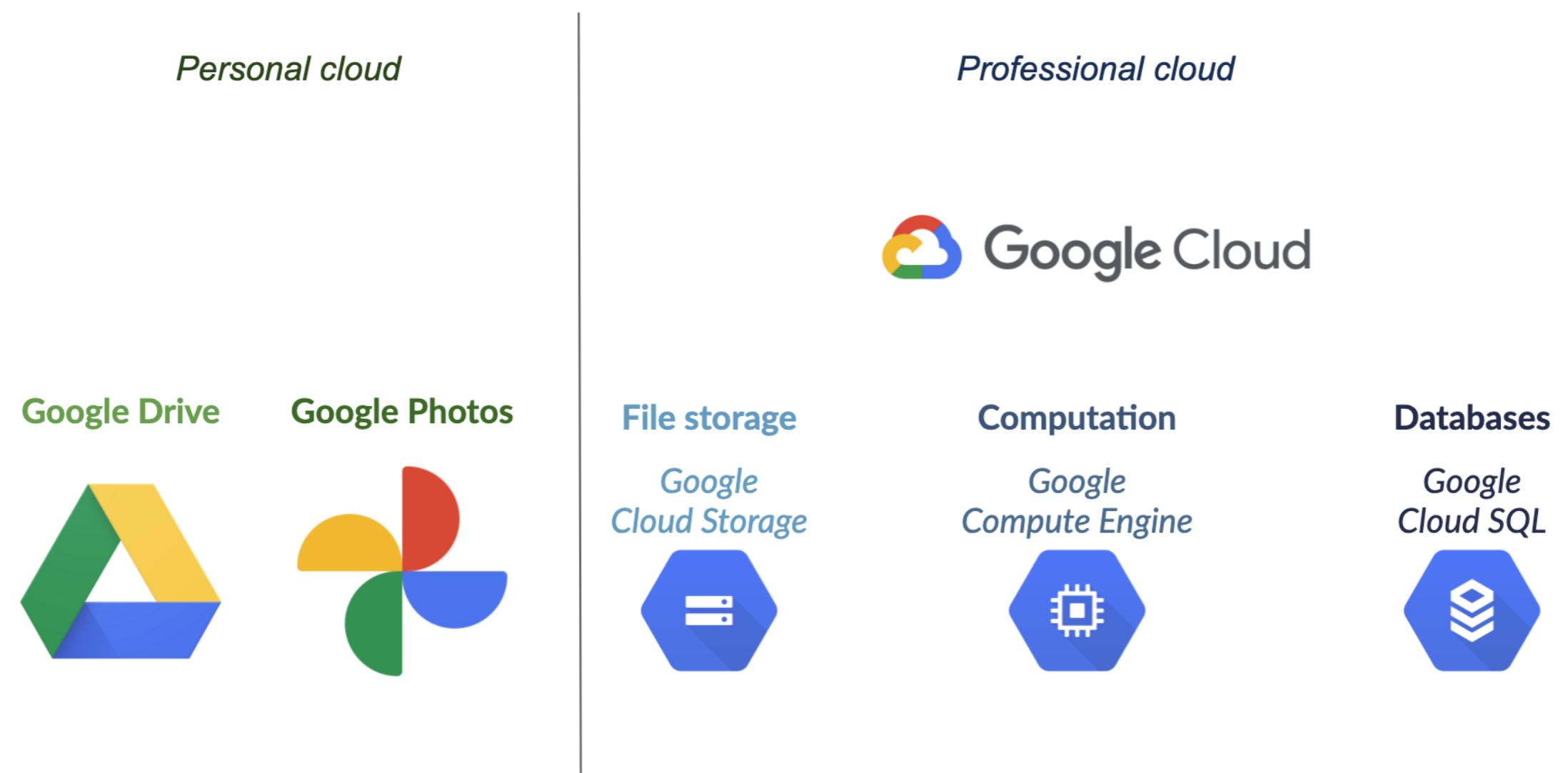
Google  
Cloud Storage



# Google Cloud services



# Google Cloud services



# Google Cloud data services

- **Big Query** (data warehouse)
- **Dataflow** (batch and stream data processing)
- **AutoML** (machine learning model training and development)

# Google Cloud's strength

## Multicloud

- Google Cloud Anthos

--> Run hybrid multicloud solutions: manage and deploy across several cloud providers

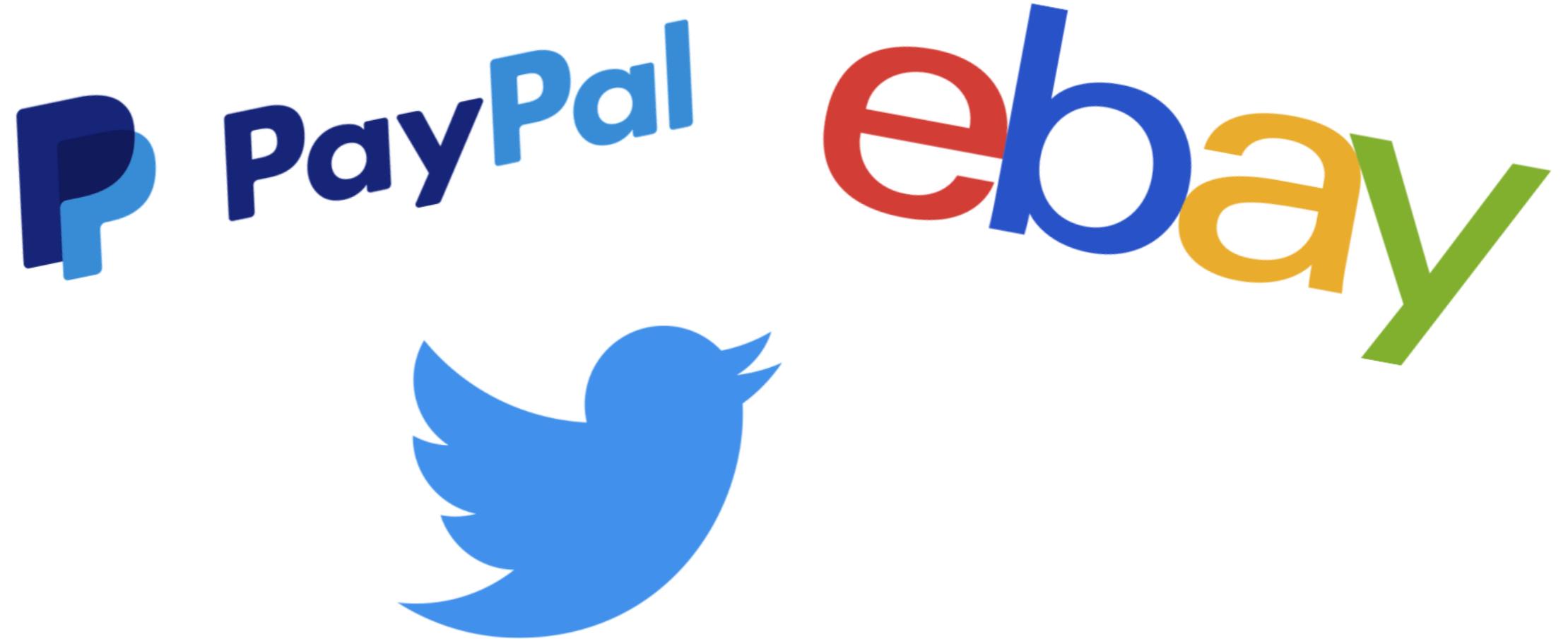
# Google Cloud customers



# Google Cloud customers



# Google Cloud customers



# Google Cloud case study

**Organization:** Lush

**Needs:** Improve e-commerce platform availability and stability during peak loads

**Solution:**

- Migrate entire global infra to Google Cloud
- Google Cloud Compute Engine (quickly test and provision environments during migration)
- Customer and product data on Google Cloud SQL



# Google Cloud case study

## Improvements:

- No outage during Boxing Day
- 40% reduction in hosting costs
- Later deployed an image recognition app to provide information on their product and reduce plastic packaging on Google Cloud AI platform

The logo for LUSH is displayed in large, bold, black letters. The letters are slightly irregular and have a hand-drawn feel. The 'U' has a small loop at the top, and the 'H' has a vertical stroke on its right side.

<sup>1</sup> <https://cloud.google.com/customers/lush/>

# **Let's practice!**

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# Other actors and final thoughts

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# Alibaba's position on the cloud infrastructure market



- Q4 2019 market share: **5.4%**
- Q4 2019 revenue: **\$1.6B**
- Annual growth: **71.1%**

# Alibaba Cloud services

*Personal cloud*



# Alibaba Cloud services

*Personal cloud*



*Professional cloud*

 **Alibaba Cloud**

File storage

Object Storage  
Service



# Alibaba Cloud services

*Personal cloud*



*Professional cloud*

 **Alibaba Cloud**

File storage

*Object Storage Service*



Computation

*Elastic Compute Service*



# Alibaba Cloud services

*Personal cloud*



*Professional cloud*

 **Alibaba Cloud**

**File storage**

*Object Storage Service*



**Computation**

*Elastic Compute Service*



**Databases**

*ApsaraDB*  
*RDS*



# Alibaba Cloud data services

- **E-MapReduce** (big data processing)
- **QuickBI** (analytics and visualization)
- **Machine Learning Platform for AI**

# Alibaba Cloud customers



# Alibaba Cloud customers



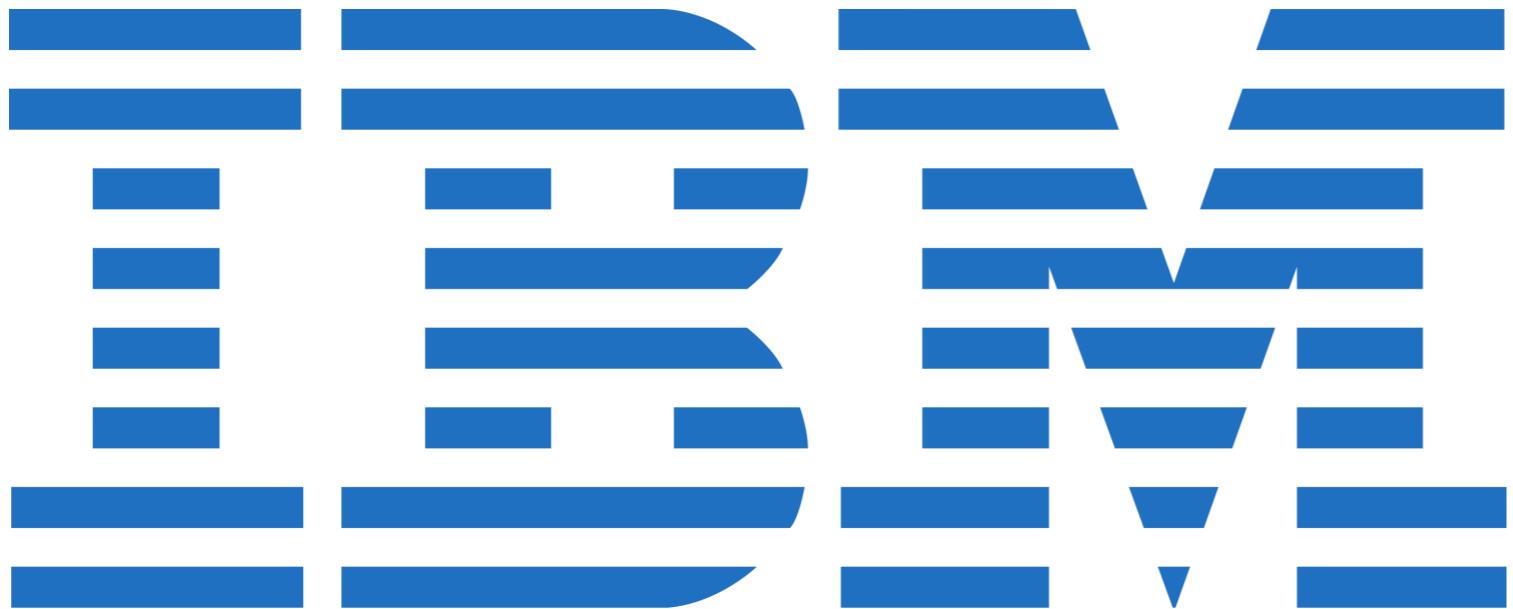
Schneider  
Electric

# Alibaba Cloud customers



Schneider  
Electric

# IBM's position on the cloud infrastructure market



- Q4 2019 market share: **1.8%**
- Q4 2019 estimated revenue: **\$530M**

# IBM Cloud services

*Personal cloud*



# IBM Cloud services

*Personal cloud*



*Professional cloud*



File storage

*IBM Cloud  
Object Storage*



# IBM Cloud services

*Personal cloud*



*Professional cloud*



File storage

*IBM Cloud  
Object Storage*



Computation

*IBM Cloud  
Virtual Server*



# IBM Cloud services

*Personal cloud*



*Professional cloud*



**File storage**

*IBM Cloud  
Object Storage*



**Computation**

*IBM Cloud  
Virtual Server*



**Databases**

*IBM Cloud  
DB2*



# IBM Cloud data services

- **Watson Knowledge Catalog** (find, curate, categorize and share data)
- **SPSS Statistics** (analytics with SPSS)
- **Watson Machine Learning** (train and deploy machine learning models)

# IBM Cloud customers



# IBM Cloud customers



# IBM Cloud customers



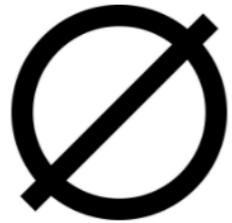
# Oracle's position on the cloud infrastructure market



- Smaller market share
- Exact numbers not published

# Oracle Cloud services

*Personal cloud*



# Oracle Cloud services

*Personal cloud*



*Professional cloud*

**ORACLE**

File storage

Object Storage



# Oracle Cloud services

*Personal cloud*



*Professional cloud*

**ORACLE**

File storage

Object Storage



Computation

Virtual Machines



# Oracle Cloud services

*Personal cloud*



*Professional cloud*

**ORACLE**

File storage

Object Storage



Computation

Virtual Machines



Databases

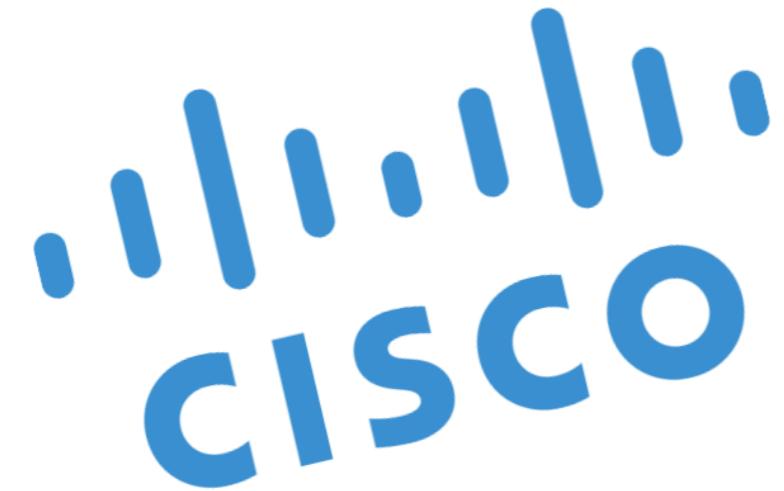
MySQL Database Service



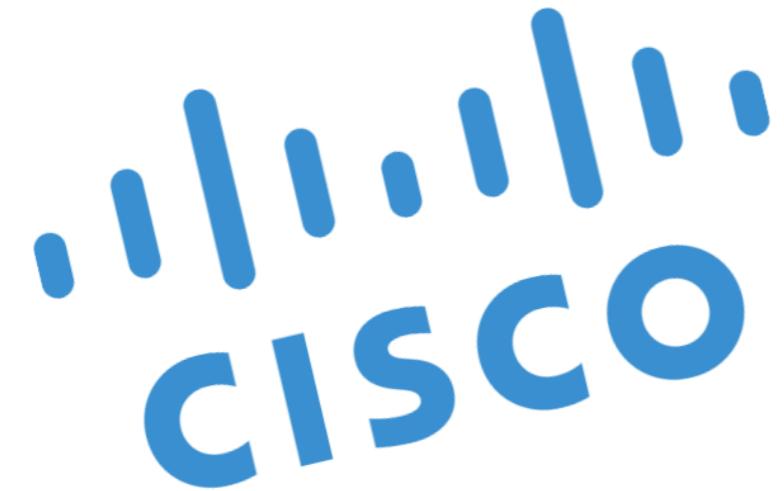
# Oracle Cloud data services

- **Autonomous Database** (data marts, data lakes, and batch data processing)
- **Analytics Cloud** (automated data preparation, visualization, forecasting and reporting)
- **Machine Learning** (train and deploy machine learning models)

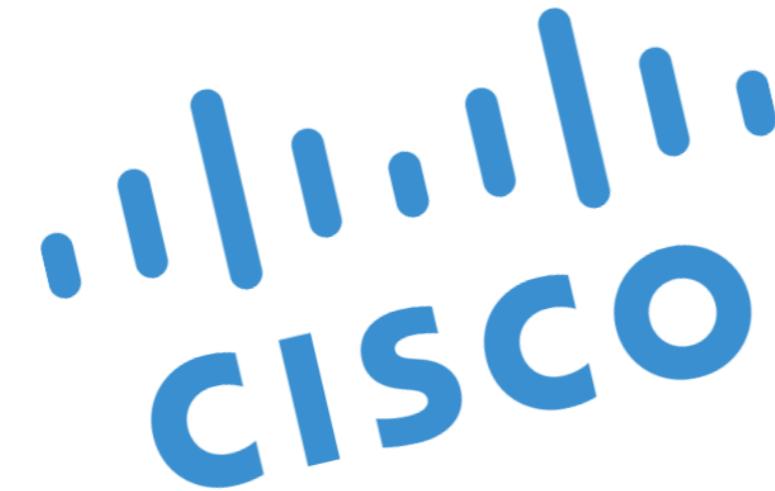
# Oracle Cloud customers



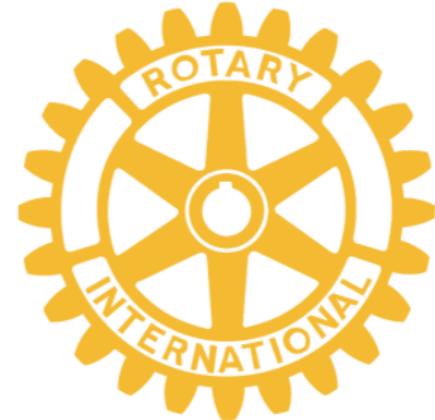
# Oracle Cloud customers



# Oracle Cloud customers



Rotary



# Keep in mind!

- Fierce competition: **things will move**
- Including SaaS tells a **different story**

# Making your case

- Best provider is the one meeting your **needs**:
  - **Current infrastructure costs**
  - Cost of running a **data center, physical hardware, storage**
  - Cost of **applications** (deprecate, migrate, rebuild)
  - Cost of **hiring** cloud specialists
  - **Benefits** for company and customers
  - **Risks** (regulation, security, disaster, vendor lock-in)

# Future of the cloud

- **Growing** amount of **data**
- AI needs computing **resources**
- Smart cities need an underlying **infrastructure**
- **Serverless** architectures are more and more popular

# **Let's practice!**

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# Congratulations!

## UNDERSTANDING CLOUD COMPUTING



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# Chapter 1 - Introduction to cloud computing

- How cloud computing **works**
- Why it is **powerful**
- Main **service models** (IaaS, PaaS, SaaS)

# Chapter 2 - Cloud strategies

- **Deployment models** (private, public, and hybrid)
- **Regulations**
- **Cloud roles**

# Chapter 3 - The cloud infrastructure market

- Market's **major players**
- Their **offerings**
- Their **customers**

# Next steps

- **Explore** further to find the right service for you
  - Talk with cloud expert
  - Explore the cloud provider websites
  - Get in touch with cloud providers
- **DataCamp's** cloud-focused **courses**

**Thank you!**  
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