

# Cloud deployment models

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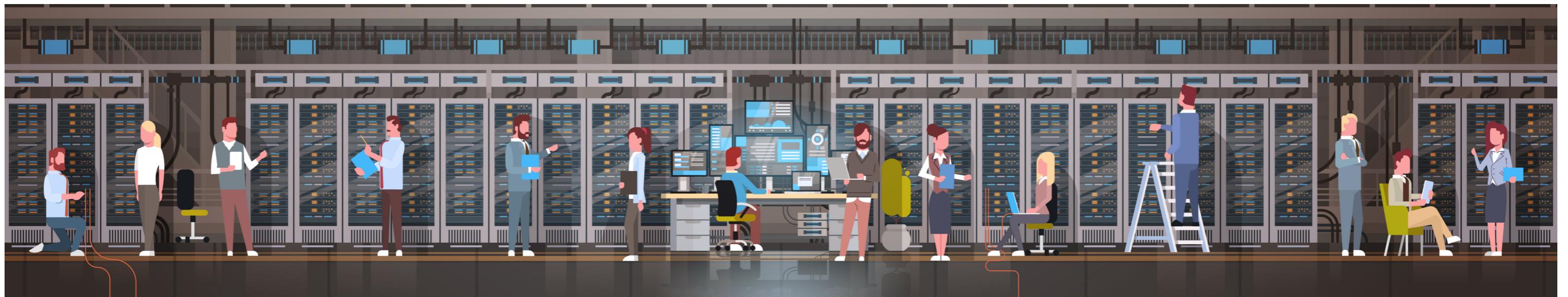


**Lis Sulmont**

Curriculum Manager, DataCamp

# Cloud deployment models

- Important decision in cloud adoption
- How much control do you need over your cloud environment?
- Three main types: **private, public, and hybrid**



# Private cloud

Cloud infrastructure is designated for exclusive use by its tenants.

Private clouds are accessed by a network link.

*Pros:* Direct control of resources and data

*Cons:* More upfront investment

Unlike on-premise, private cloud uses virtualization for on-demand compute resources and can be off-premises.



# Public cloud

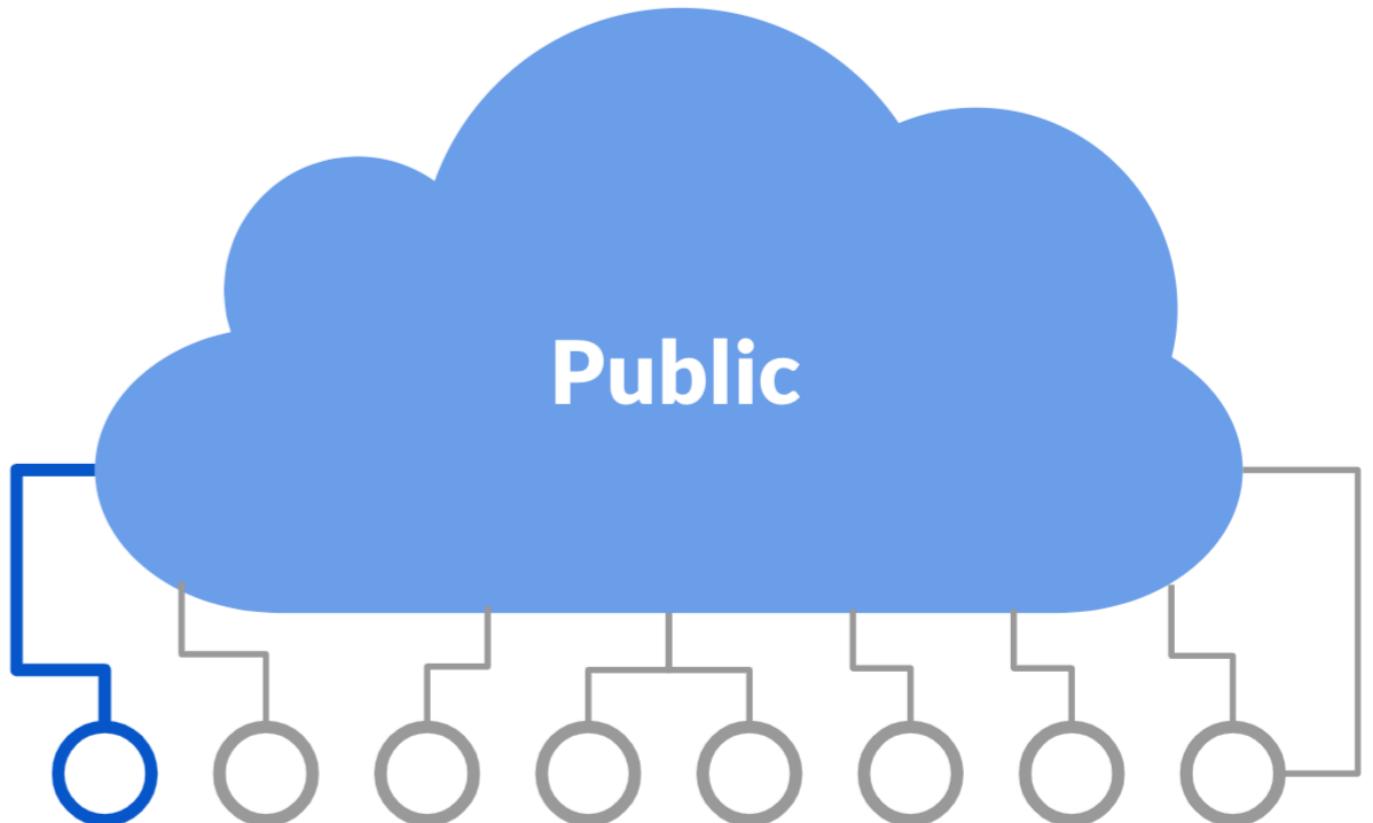
Cloud infrastructure is shared and open for use by the general public. It's owned and managed by a cloud service provider.

Public clouds are Internet accessible.

*Pros:*

- Get started quickly with minimal investment
- Easier to scale

*Cons:* No access to data center and hardware

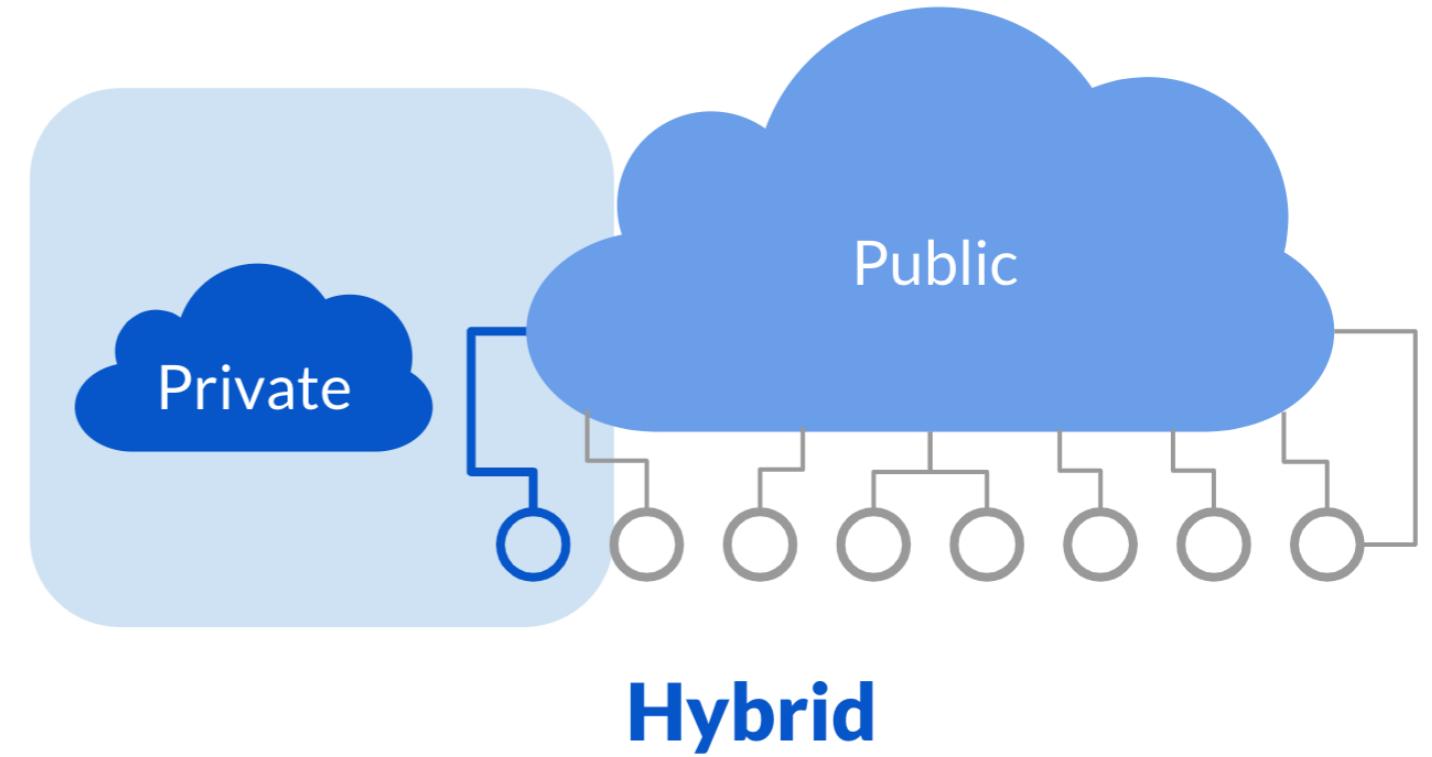


# Hybrid cloud

Organization uses a combination of two or more distinct models.

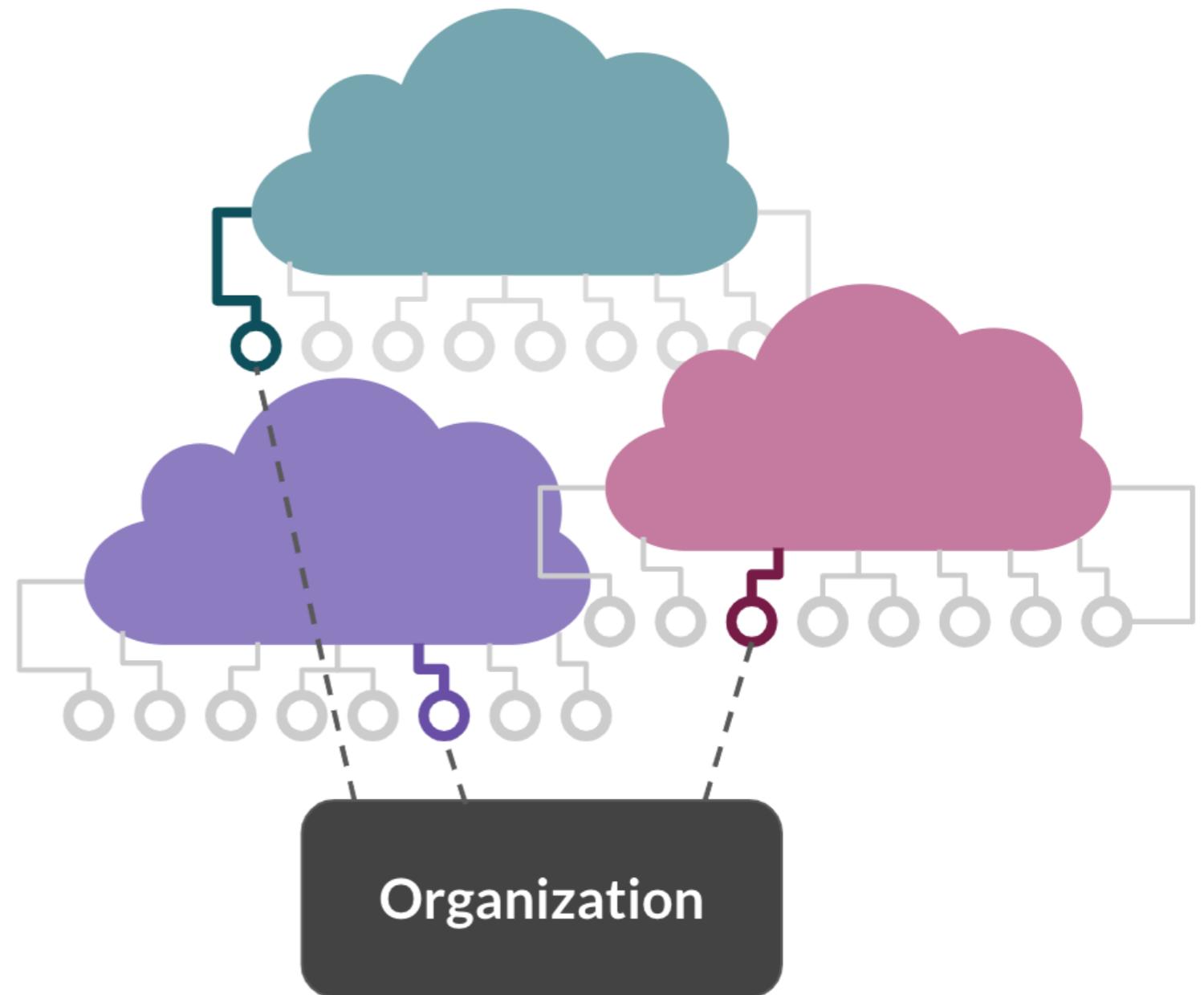
Use cases:

- Store sensitive data on the private cloud and use application on public cloud for analytics
- **Cloud bursting:** when private cloud hits capacity, temporarily move overflow to the public cloud to avoid disruption of service



# Other deployment models

- **Multicloud**
  - Combination of different cloud provider services
  - Flexibility on pricing plans and service offerings
  - No reliance on one vendor



# Other deployment models

- **Community**
  - Infrastructure shared by a specific community for exclusive use
  - Common interest or concern, e.g., security, jurisdiction, mission
  - Can be managed and hosted internally or externally



# **Let's practice!**

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# Regulations on the cloud

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**Lis Sulmont**

Curriculum Manager, DataCamp

















# General Data Protection Regulation (GDPR)

- Regulates how personal data is collected, processed, and stored from users in the EU
- Examples:
  - Users must explicitly consent to data collection
  - Notify users of any data breaches
  - Personal data information must be encrypted, anonymized, and/or pseudonymized
  - **Personal data can't leave EU borders, unless you can guarantee the same level of protection**
- Fine: 20 million Euros or up to 4% of the worldwide annual revenue

# What is personal data?

Personal data is any information that relates to an identified or identifiable living individual. Different pieces of information, which collected together can lead to the identification of a particular person, also constitute personal data. [1]

- Includes: *home address, first name, last name, email address, location data, IP address, racial or ethnic origin, political opinions, sexual orientation, health related data*
- Personally identifiable information (PII)

<sup>1</sup> [https://ec.europa.eu/info/law/law-topic/data-protection/reform/what-personal-data\\_en](https://ec.europa.eu/info/law/law-topic/data-protection/reform/what-personal-data_en)

# Other regulations

- Brazil's Lei Geral de Proteção de Dados (LGPD)
- California's Consumer Privacy Act (CCPA)
- USA's Health Insurance Portability and Accountability Act (HIPAA)
- Japan's Act on Protection of Personal Information
- Thailand Personal Data Protection Act (PDPA)
- Canada's Personal Information Protection and Electronic Documents Act (PIPEDA)

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# Cloud roles

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**Lis Sulmont**

Curriculum Manager

# Most in-demand skill: cloud computing



# Familiar data roles and the cloud

- **Data scientist**
  - Run computationally expensive analyses on the cloud
- **Machine learning scientist**
  - Train and deploy machine learning models on the cloud
- **Data engineer**
  - Build pipelines on the cloud to ingest, transform, and store big data
- **Data analyst**
  - Access data on the cloud via business intelligence tools

# Creation of new cloud roles

- Cloud architect
- Cloud engineer
- DevOps engineer
- Security engineer

# Cloud architect

- Solutions architect for the cloud
- Design cloud infrastructure for a given business problem
- Plan the deployment of the infrastructure
- Ensure scalability and optimized for cost



# Cloud engineer

- Build, maintain and monitor cloud services
- Migrating operations to the cloud



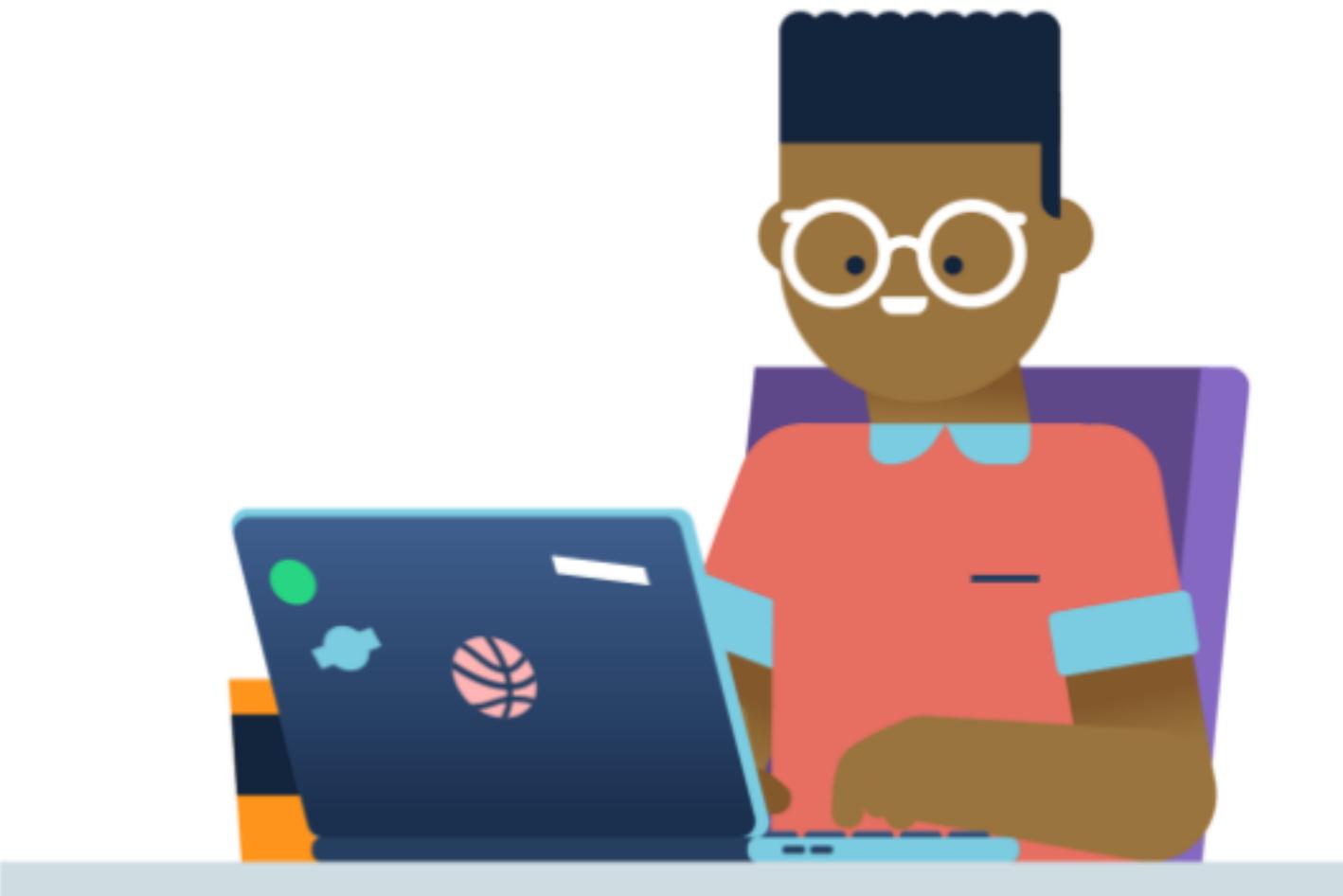
# DevOps engineer

- Software Development + IT Operations
- Infrastructure as code
- Ensure the reliability, availability, and scalability of the cloud through software development and automation



# Security engineer

- Spec security requirements
- Test and assess security of data on the cloud
- Responsible for protecting organization and user data



# **Let's practice!**

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