Cloud deployment models

UNDERSTANDING CLOUD COMPUTING

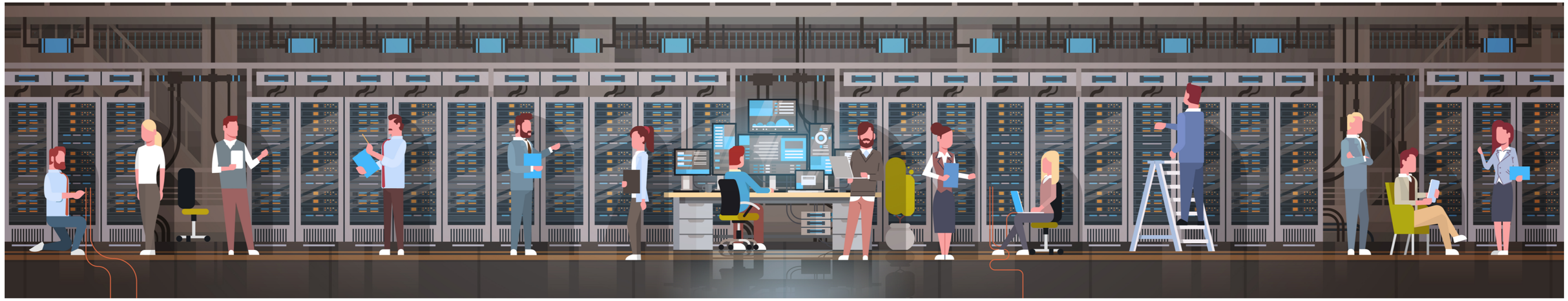


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Cloud deployment models

- 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

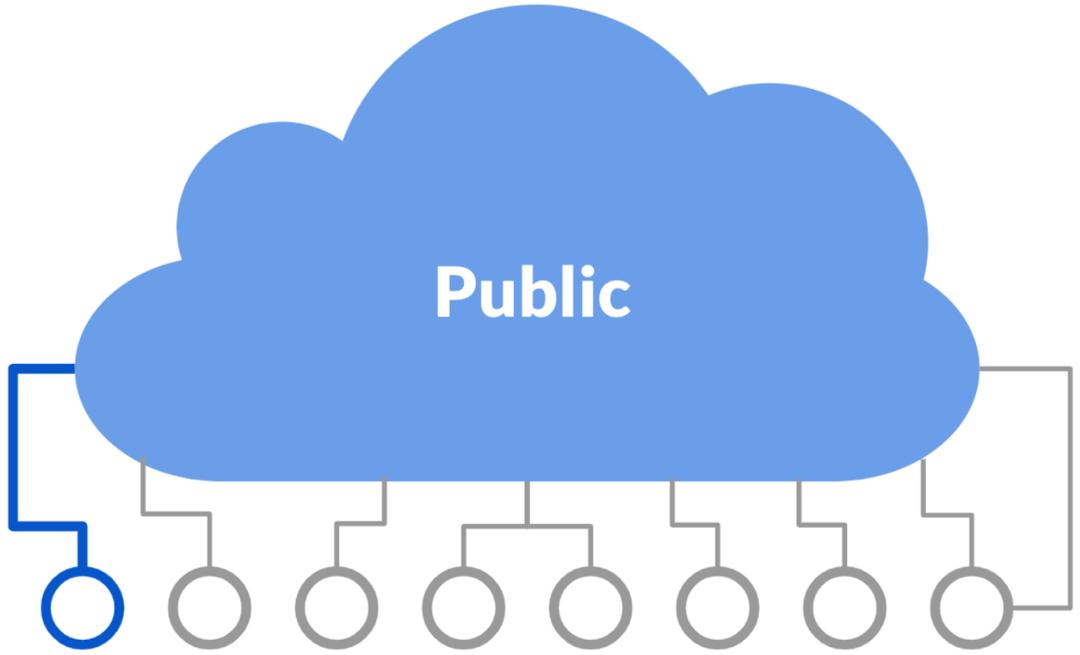
Cloud infrastructure is shared and open for use by the general public. It's owned and managed by a cloud service provider.

Public clouds are Internet accessible.

Pros:

- Get started quickly with minimal investment
- Easier to scale

Cons: No access to data center and hardware

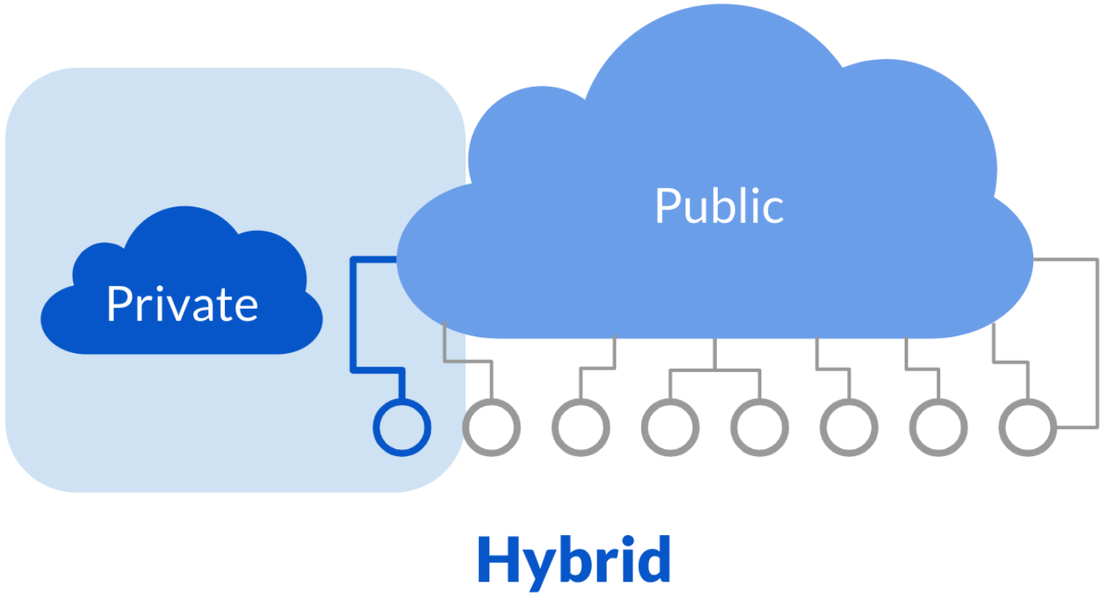


Hybrid cloud

Organization uses a combination of two or more distinct models.

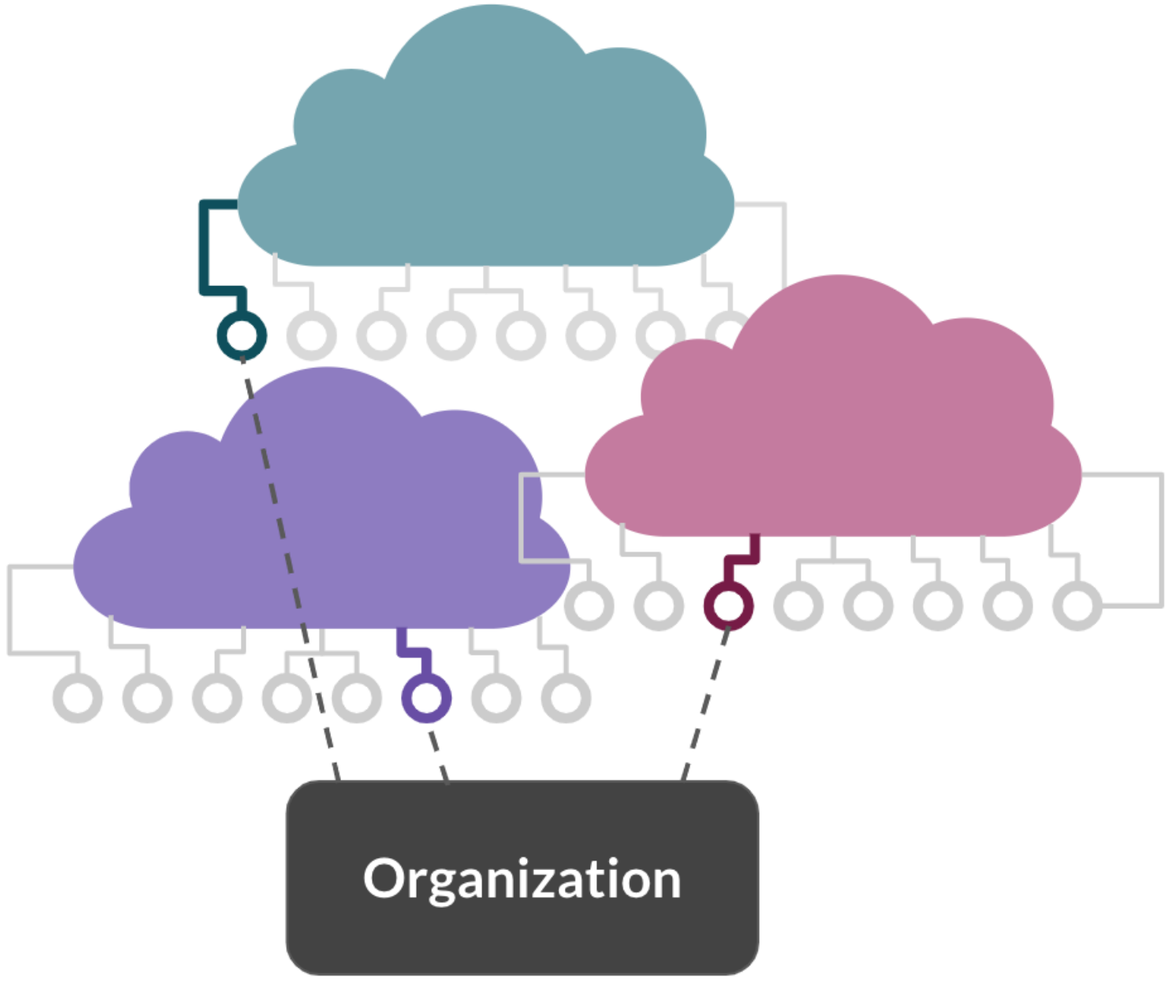
Use cases:

- 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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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)

[1] https://ec.europa.eu/info/law/law-topic/data-protection/reform/what-personal-data_en

Other regulations

- Brazil's Lei Geral de Proteçao 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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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



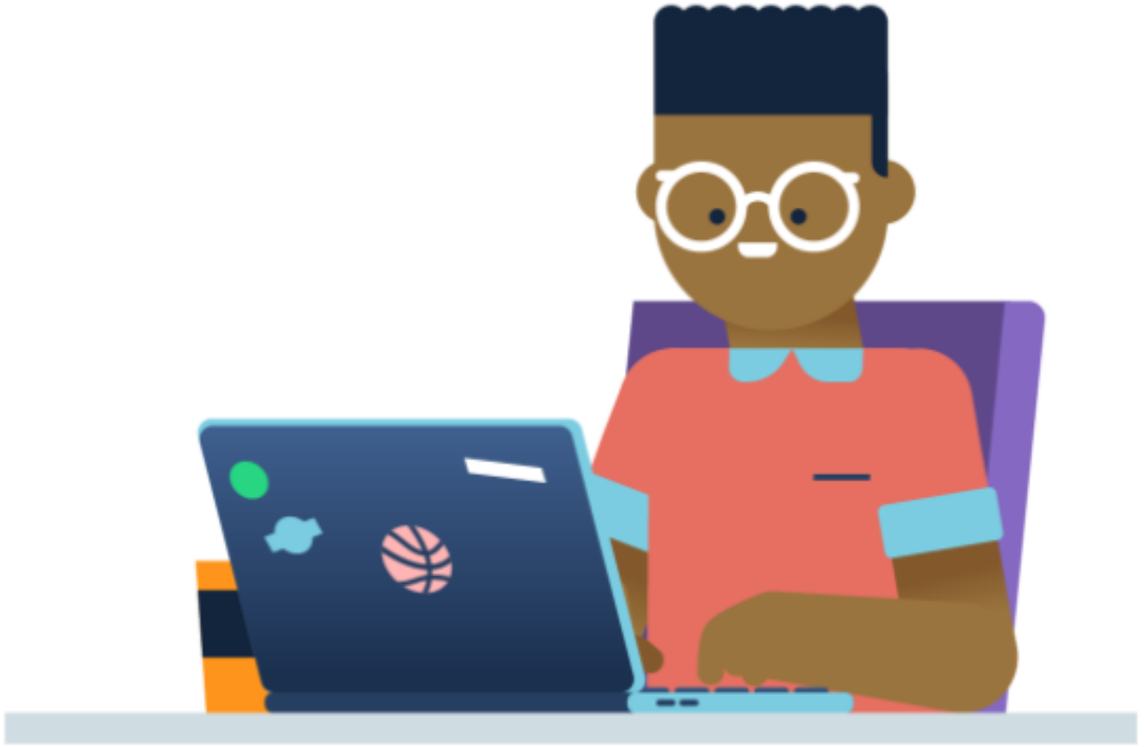
DevOps engineer

- Software **Dev**elopment + IT **Op**erations
- 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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