Cloud Security

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Cloud Security Idea/Concept

Cloud security, also known as cloud computing security, is a collection of security measures designed to protect cloud-based infrastructure, applications, and data.

- protect a company's data
- distributed denial of service (DDoS) attacks, malware, hackers, and unauthorized user access or use

Types of cloud deployment models

1. Private Cloud
2. Public Cloud
3. Hybrid Cloud

Public Cloud

Public cloud services are hosted by third-party cloud service providers. Security features, such as access control, identity management, and authentication, are crucial to public clouds.

Pros of public cloud:

- Highly scalable
- Cost-effective
- Management is delegated to the cloud service provider
- Not bound by geographical restrictions

Cons of public cloud:

- Offers less customization
- Sudden changes by cloud provider can have dire impacts
- Lesser autonomy over servers
- Since the server is shared, it is less secure

Private Cloud

Private clouds are typically more secure than public clouds, as they're usually dedicated to a single group or user and rely on that group or user's firewall.

Pros of a private cloud:

- Highest level of security
- Better autonomy over the servers
- Highly customizable
- No risk of sudden changes that can disrupt company operations

Cons of a private cloud:

- Requires extensive expertise of IT personnel
- Comparatively expensive

Hybrid Cloud

Hybrid clouds combine the scalability of public clouds with the greater control over resources that private clouds offer.

Pros of hybrid cloud:

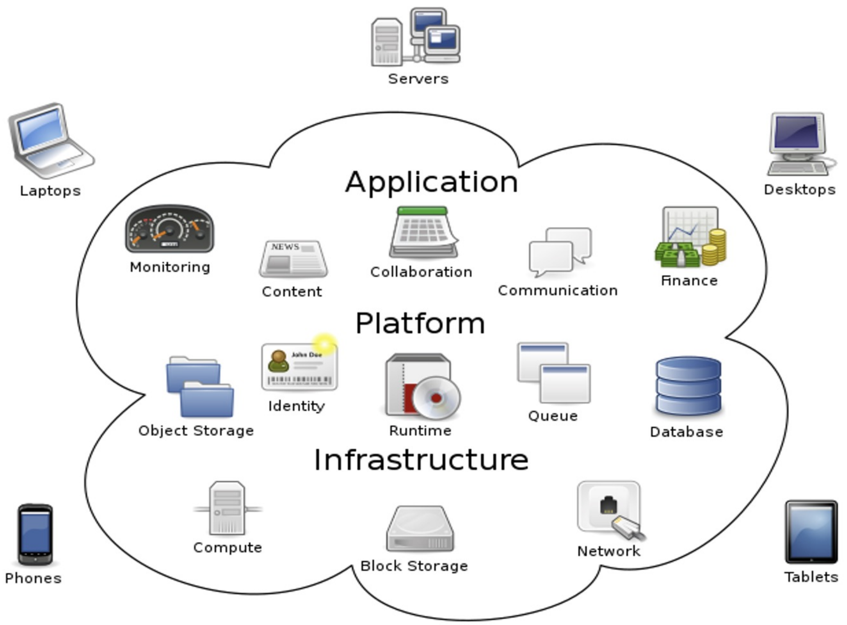
- Highly secure, flexible, and economic
- Better security than pure public cloud solutions

Cons of hybrid cloud:

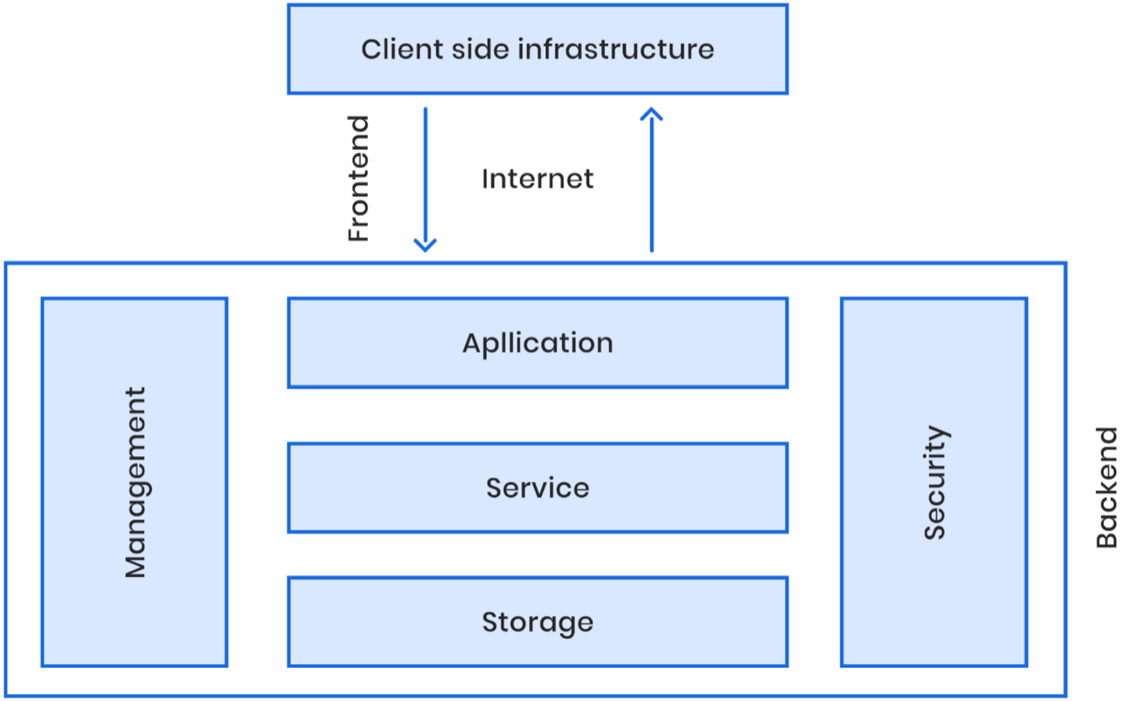
- Since communication occurs between public and private clouds,it can become conflicted at times.

Cloud Computer

- Delivery of computer service
- Internet access
- Reliable

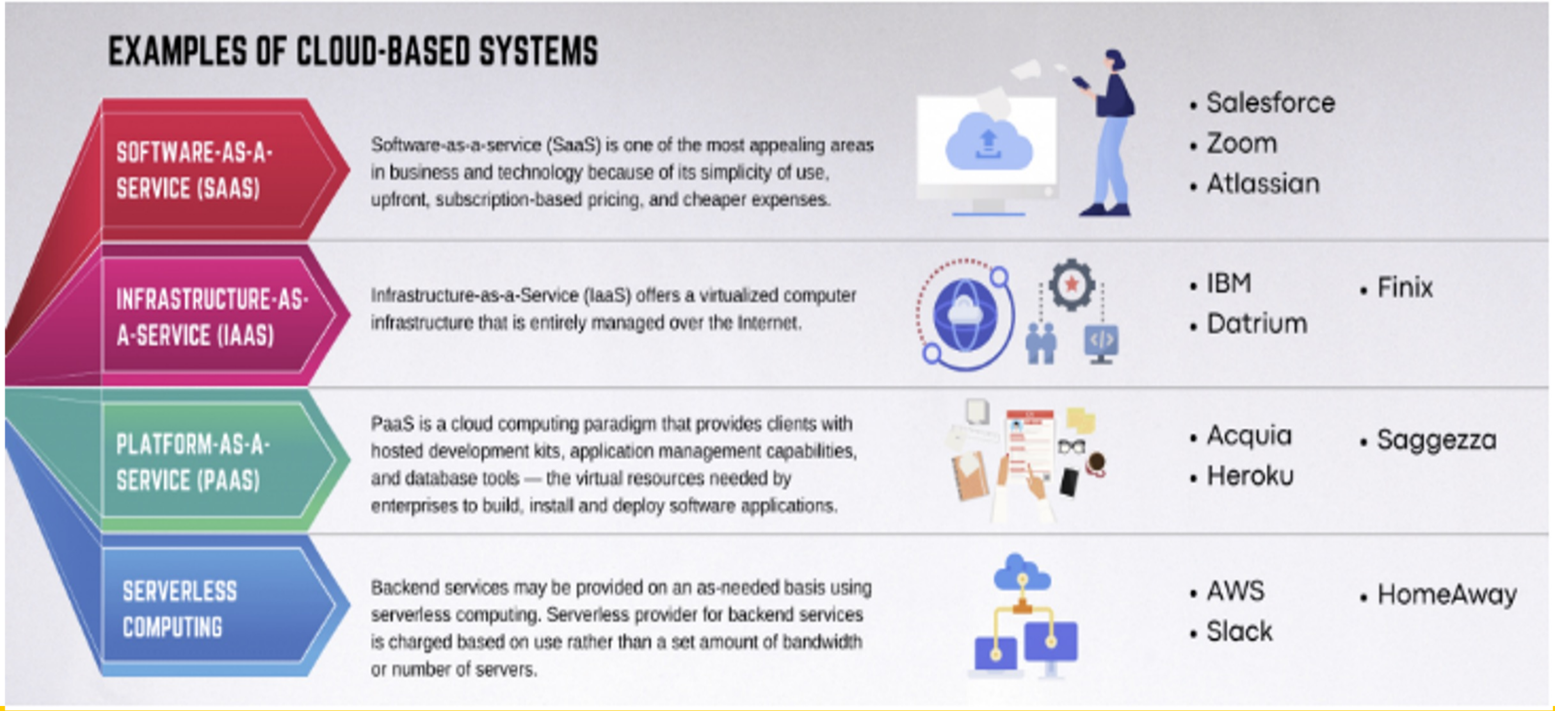


Cloud Computer Architecture



Example of Cloud Systems

- Software-as-a-Service (Saas)
- Infrastructure-as-a-Service(IaaS)
- Platform-as-a-Service(PaaS)
- Serverless Computer



EXAMPLES OF CLOUD-BASED SYSTEMS

SOFTWARE-AS-A-SERVICE (SAAS)

Software-as-a-service (SaaS) is one of the most appealing areas in business and technology because of its simplicity of use, upfront, subscription-based pricing, and cheaper expenses.

- Salesforce
- Zoom
- Atlassian

INFRASTRUCTURE-AS-A-SERVICE (IAAS)

Infrastructure-as-a-Service (IaaS) offers a virtualized computer infrastructure that is entirely managed over the Internet.

- IBM
- Datrium
- Finix

PLATFORM-AS-A-SERVICE (PAAS)

PaaS is a cloud computing paradigm that provides clients with hosted development kits, application management capabilities, and database tools — the virtual resources needed by enterprises to build, install and deploy software applications.

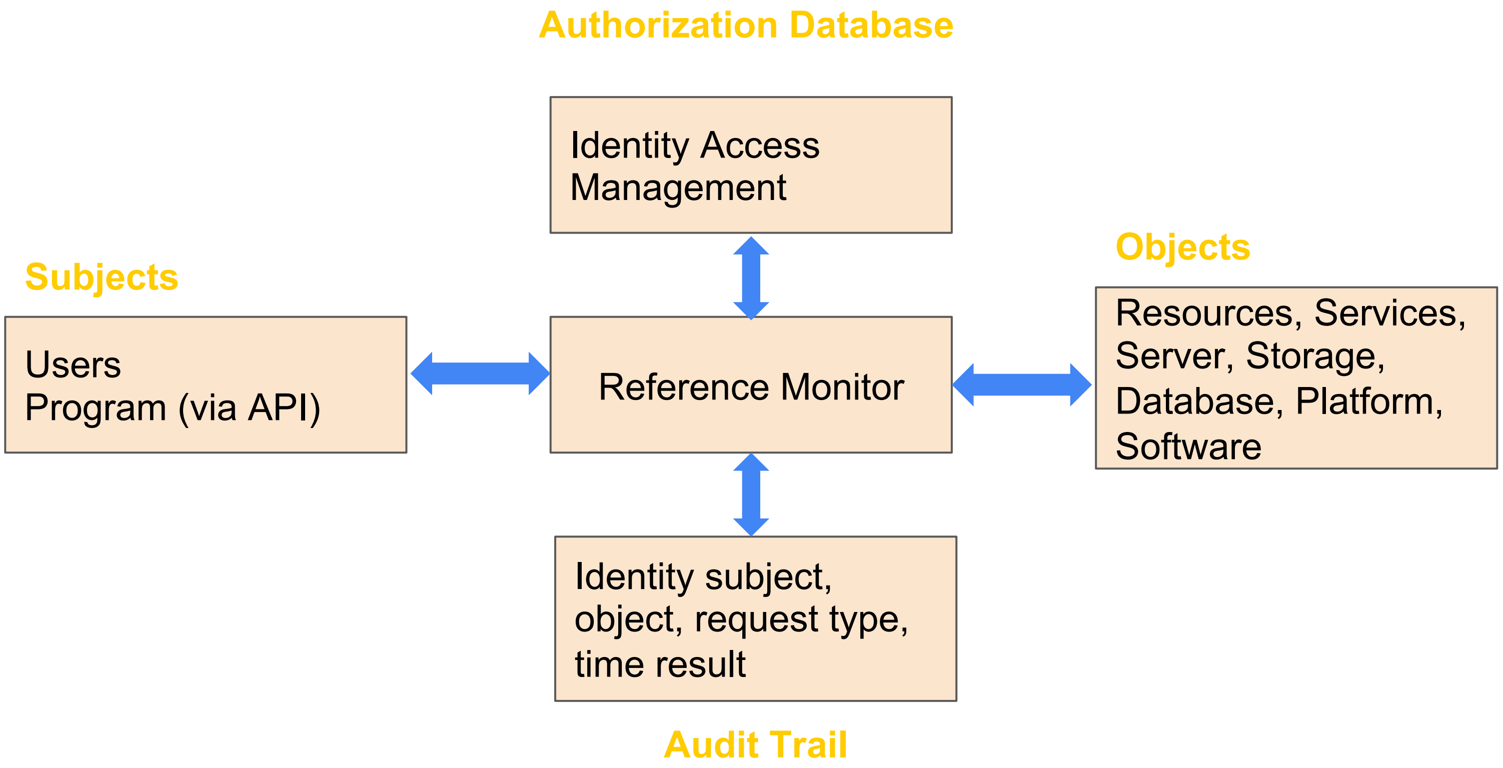
- Acquia
- Heroku
- Saggezza

SERVERLESS COMPUTING

Backend services may be provided on an as-needed basis using serverless computing. Serverless provider for backend services is charged based on use rather than a set amount of bandwidth or number of servers.

- AWS
- Slack
- HomeAway

Cloud as a Reference Monitor: 4 key components



Authorization Database

Identity Access Management

Subjects

Users
Program (via API)

Reference Monitor

Objects

Resources, Services, Server, Storage, Database, Platform, Software

Identity subject, object, request type, time result

Audit Trail

Cloud as a Reference Monitor: 3 Principles

Tamperproof ✗

Non bypassable ✗

Verifiable ✗

Advantage & Limitation

Pros:

1. Protection against attacks
2. Data security
3. Improved availability
4. Increased reliability
5. Improved scalability
6. Regulatory compliance

Limitation:

1. Vulnerable
2. Additional risk
3. Security controls -> leaving gaps or leading to configuration confusion.

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THANK YOU