Network Architecture in Cloud Computing Systems

Overview

Network architecture in cloud computing refers to the framework and design of networking resources that connect cloud-based services, servers, and clients. It ensures efficient, reliable, and secure data transfer across distributed cloud infrastructures.

Key Components

- **Front-End Platform** (Clients, User Devices)
- **Back-End Platform** (Cloud Servers & Storage)
- **Cloud-based Delivery** (Virtual Networks, Load Balancers)
- **Network Infrastructure** (Physical/Virtual Networks, Routers, Switches)
- **Security Layer** (Firewalls, Encryption, Identity Management)

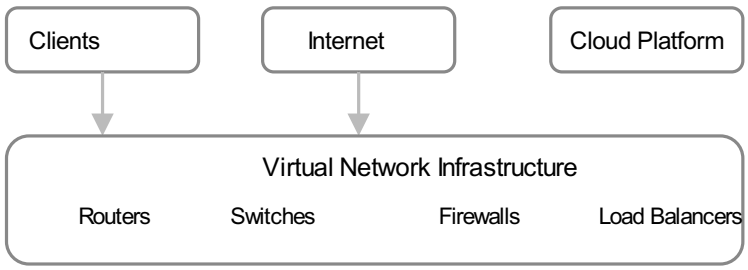

Fig.1 - Simplified Cloud Network Architecture

Network Architecture Models

Model	Description
Public Cloud	Network resources shared among multiple tenants on publicly accessible infrastructure.
Private Cloud	Dedicated network resources for a single organization, often behind firewalls.
Hybrid Cloud	Combines public and private network architectures for scalability and control.
Community Cloud	Infrastructure shared among several organizations with common concerns.

Core Design Principles

1. Scalability and Flexibility
2. High Availability and Fault Tolerance
3. Security and Compliance
4. Performance Optimization
5. Cost-Efficiency

Summary

Cloud network architecture underpins secure, fast, and scalable connectivity for cloud services by leveraging virtualized networking, layered security, and efficient resource allocation.