

CLOUD COMPUTING REFERENCE MODEL

The cloud computing reference model is like a blueprint or a map that helps us understand how cloud computing works. It does two main things:

- It breaks down the complex world of cloud computing into simpler parts that are easier to understand and work with.
- It sets standards for how these parts should work, which helps different cloud systems work together better.

This model organizes cloud computing into two types of components:

- **Layers:** Think of these like floors in a building. Each floor has its own specific job. There are five of these layers.
- **Cross-layer functions:** These are like services that run through the whole building, from the bottom floor to the top. There are three of these functions.

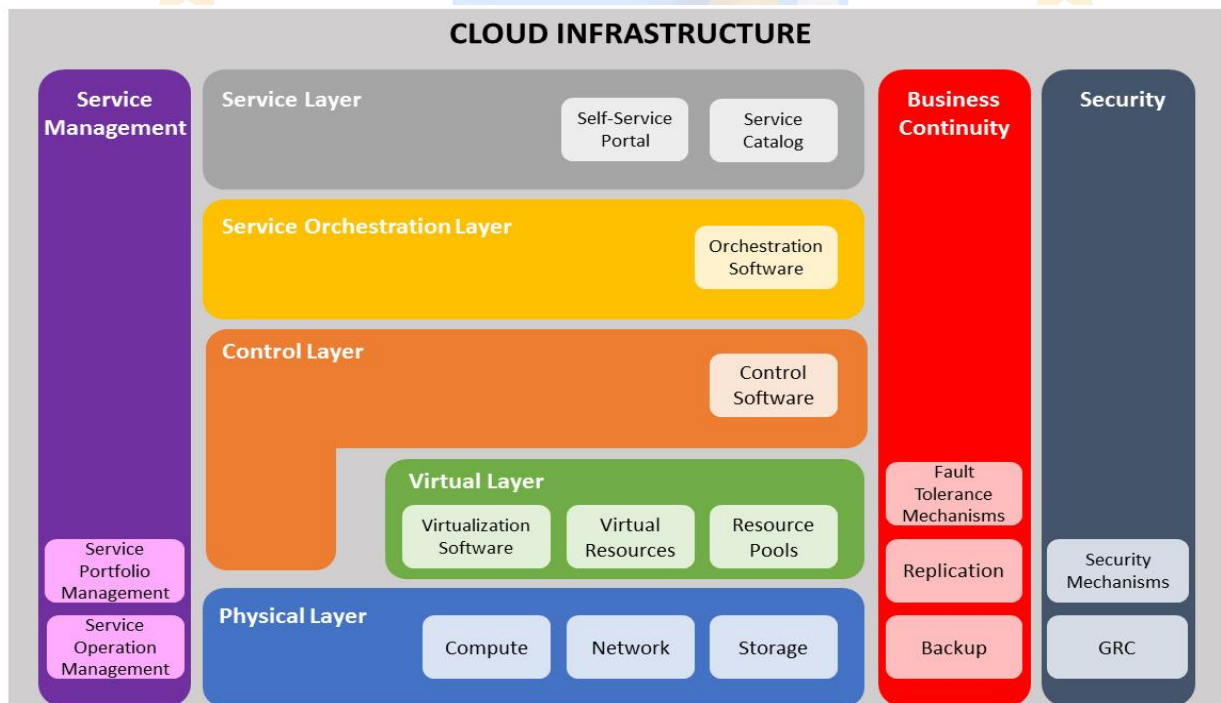
By organizing cloud computing this way, it becomes easier to:

- Understand how different parts of the cloud work

- Figure out how these parts work together
- Make sure different cloud systems can communicate and work together
- Plan and build new cloud systems

This model is called "abstract" because it's a simplified representation of how cloud computing works in real life. It focuses on the most important aspects without getting bogged down in all the technical details.

The Five Layers



1. Physical Layer

This is the foundation of the cloud. It includes actual computers, networking equipment (like routers and switches), and storage devices (like hard drives). These are the physical things you can touch. This layer does the actual work when the other layers ask it to do something.

2. Virtual Layer

This layer sits on top of the physical layer. It uses special software to create "virtual" versions of the physical resources. Imagine it's like creating multiple virtual computers inside one real computer. This allows many users to share the same physical resources without interfering with each other. It's like having your own personal space in a shared apartment.

3. Control Layer

This layer is like the manager of the cloud. It can be set up on either the physical or virtual layer. It uses control software to:

- Set up and configure resources
- Create pools of resources that can be shared
- Assign resources to different tasks or users
- Make sure resources are used efficiently

4. Service Orchestration Layer

Think of this layer as the conductor of an orchestra. It uses special software to coordinate different tasks automatically. It creates workflows, which are like step-by-step instructions for completing complex tasks involving multiple parts of the cloud.

5. Service Layer

This is the layer that users actually see and interact with. It has two main parts:

- Service Catalog: This is like a menu of all the available cloud services.
- Self-Service Portal: This is where users can choose, use, and manage their cloud services.

The Three Cross-Layer Functions

1. Business Continuity

This function works across all layers to make sure the cloud services keep running, even if problems occur. It includes:

- Planning ahead to prevent issues (proactive measures)
- Having backup plans to quickly fix issues (reactive measures)
- Making sure services meet the promised level of availability

2. Security

This function protects the entire cloud system. It includes:

- Administrative security: Rules, policies, and procedures to keep things safe
- Technical security: Tools like firewalls and antivirus software to protect against threats
- Ensuring the cloud meets legal and regulatory requirements

3. Service Management

This function takes care of the business side of running a cloud service. It has two main parts:

Service Portfolio Management:

- Planning what services to offer and how they should work
- Deciding where to invest money to improve services
- Setting prices for services
- Handling customer orders, bills, and payments

Service Operation Management:

- Setting up the cloud infrastructure
- Fixing problems when they occur
- Making sure there's enough capacity to meet demand

- Ensuring the cloud follows all necessary rules and regulations
- Monitoring how well the cloud services are working

