



# SNS COLLEGE OF ENGINEERING



Kurumbapalayam(Po), Coimbatore – 641 107

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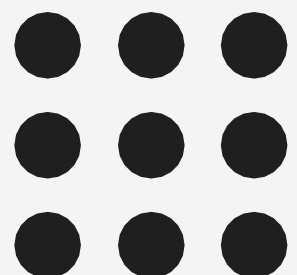
## Department of Information Technology

Course Name – CS8791 Cloud Computing

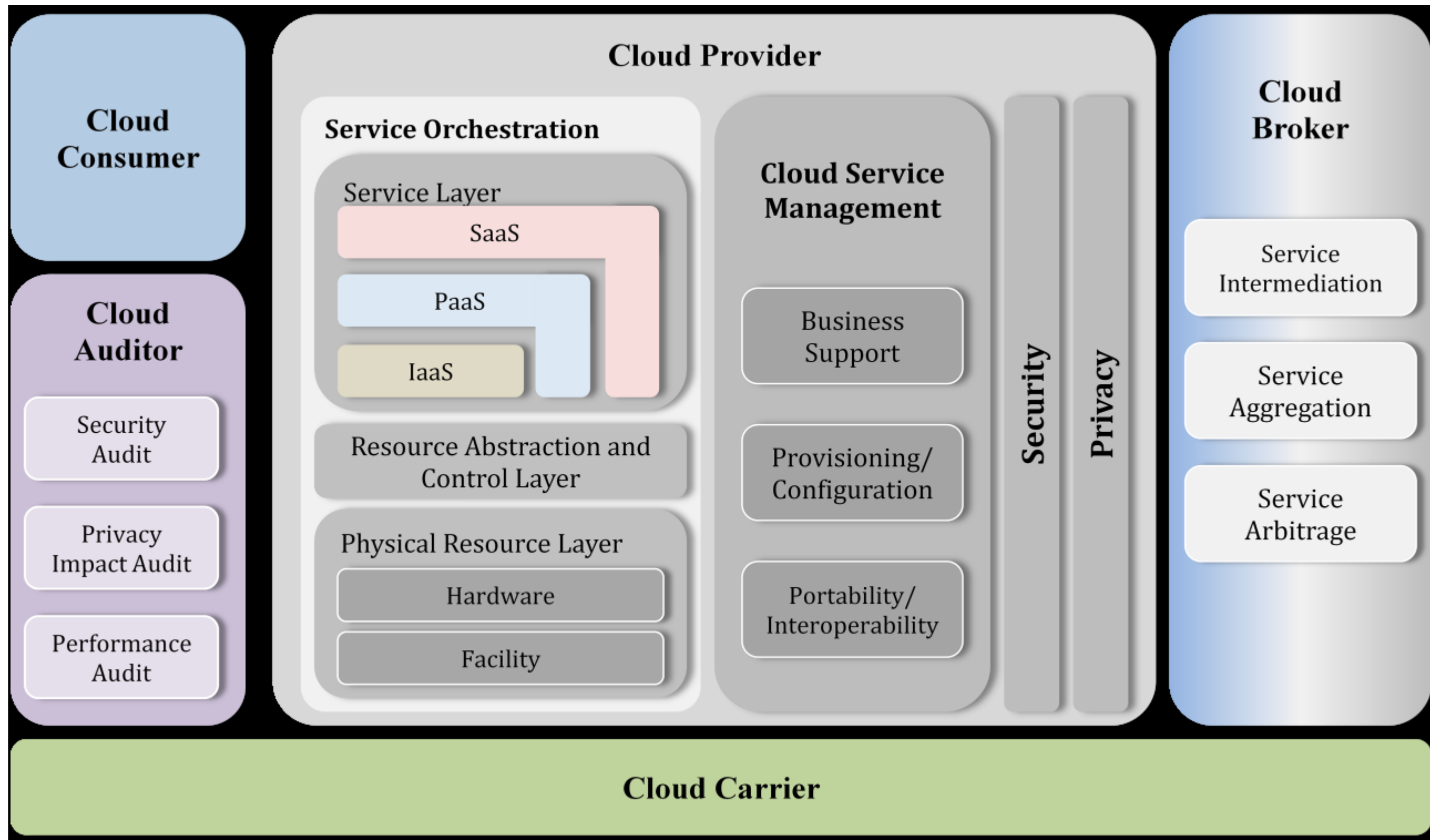
IV Year / VII Semester

Unit 3 – Cloud Architecture, Service and Storage

Topic 1 – NIST Cloud Reference Architecture



# NIST CLOUD REFERENCE ARCHTECTURE



# NIST CLOUD REFERENCE ARCHTECTURE

The NIST cloud computing reference architecture defines five major actors:

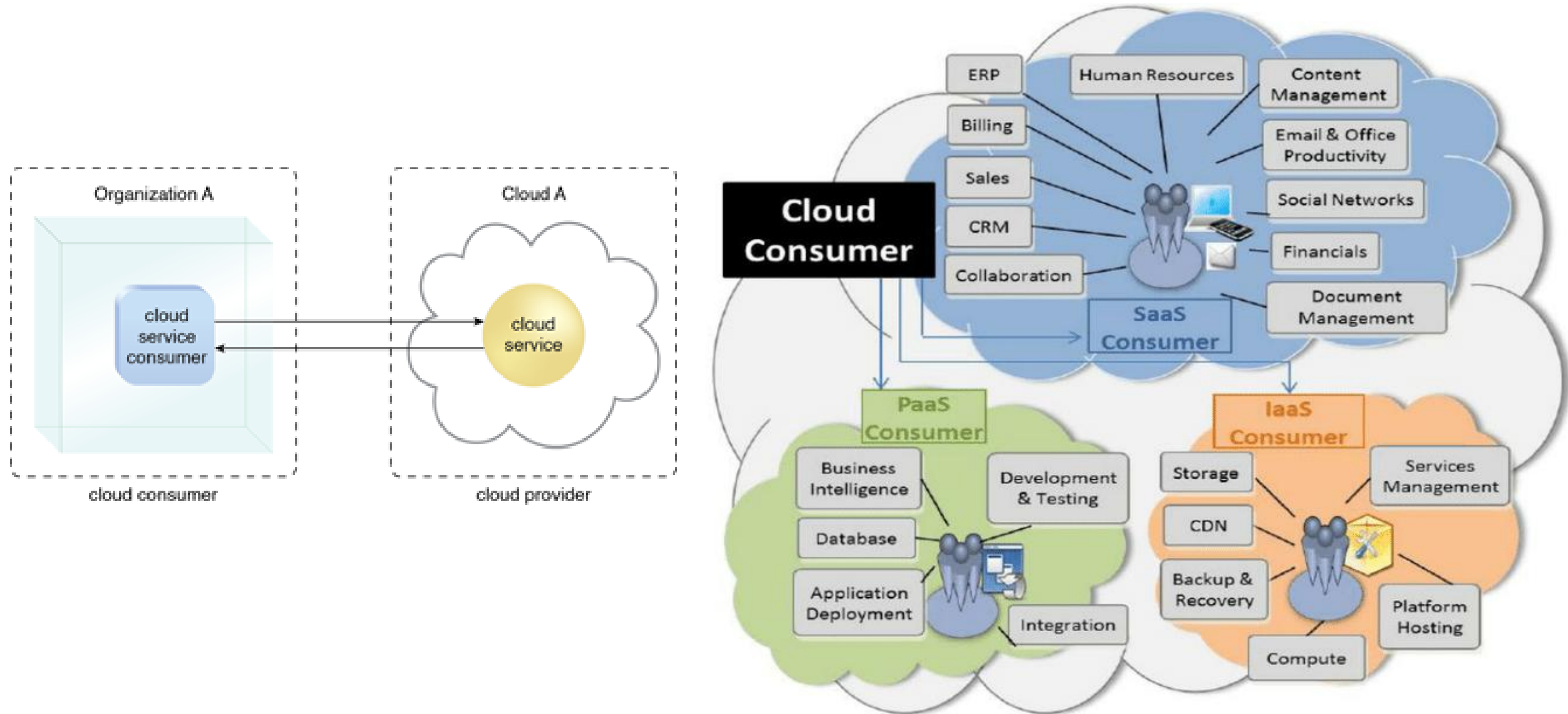
- cloud consumer,
- cloud provider,
- cloud carrier,
- cloud auditor and
- cloud broker.

Actor	Definition
<b>Cloud Consumer</b>	A person or organization that maintains a business relationship with, and uses service from, <i>Cloud Providers</i> .
<b>Cloud Provider</b>	A person, organization, or entity responsible for making a service available to interested parties.
<b>Cloud Auditor</b>	A party that can conduct independent assessment of cloud services, information system operations, performance and security of the cloud implementation.
<b>Cloud Broker</b>	An entity that manages the use, performance and delivery of cloud services, and negotiates relationships between <i>Cloud Providers</i> and <i>Cloud Consumers</i> .
<b>Cloud Carrier</b>	An intermediary that provides connectivity and transport of cloud services from <i>Cloud Providers</i> to <i>Cloud Consumers</i> .

**Table 1: Actors in Cloud Computing**

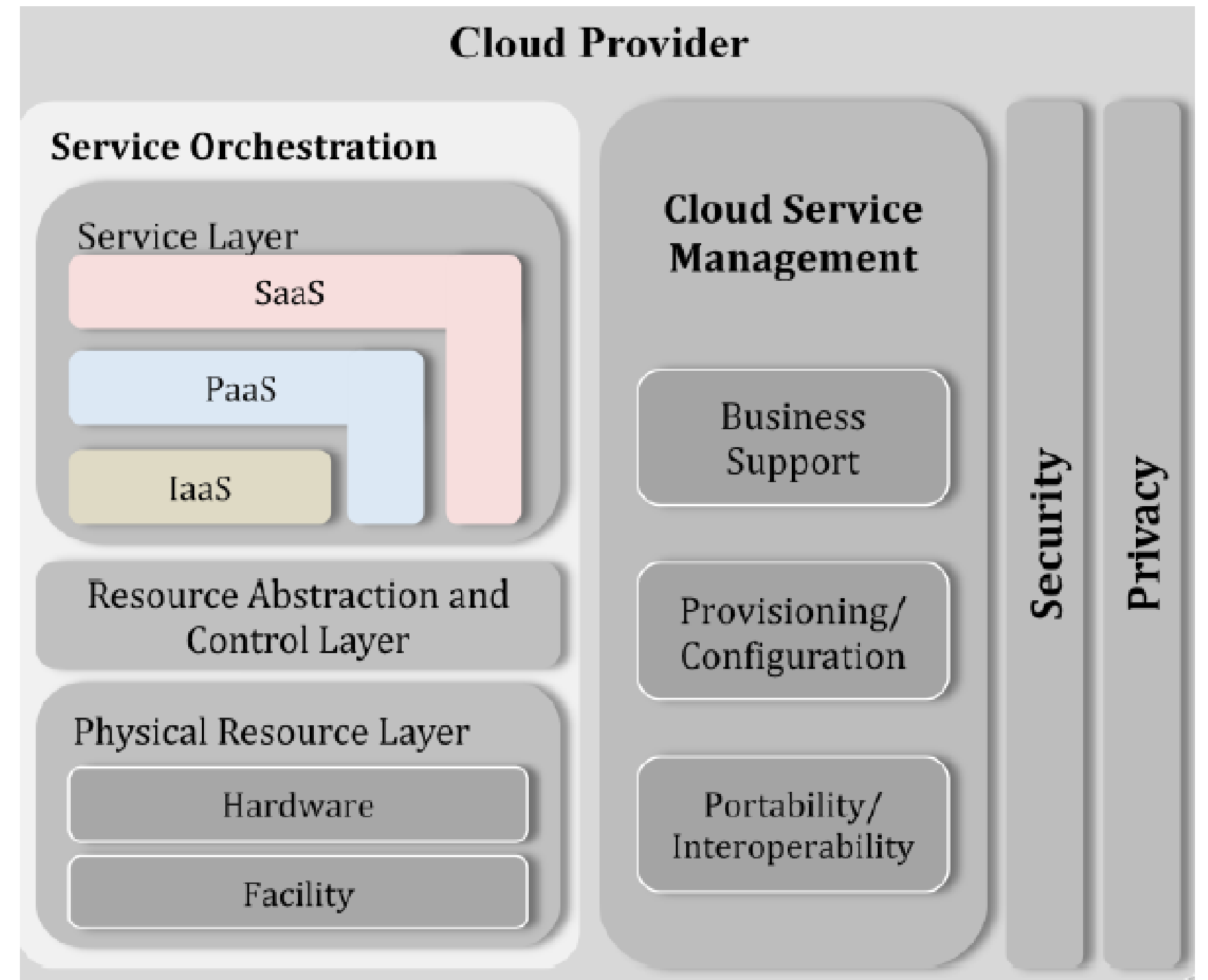
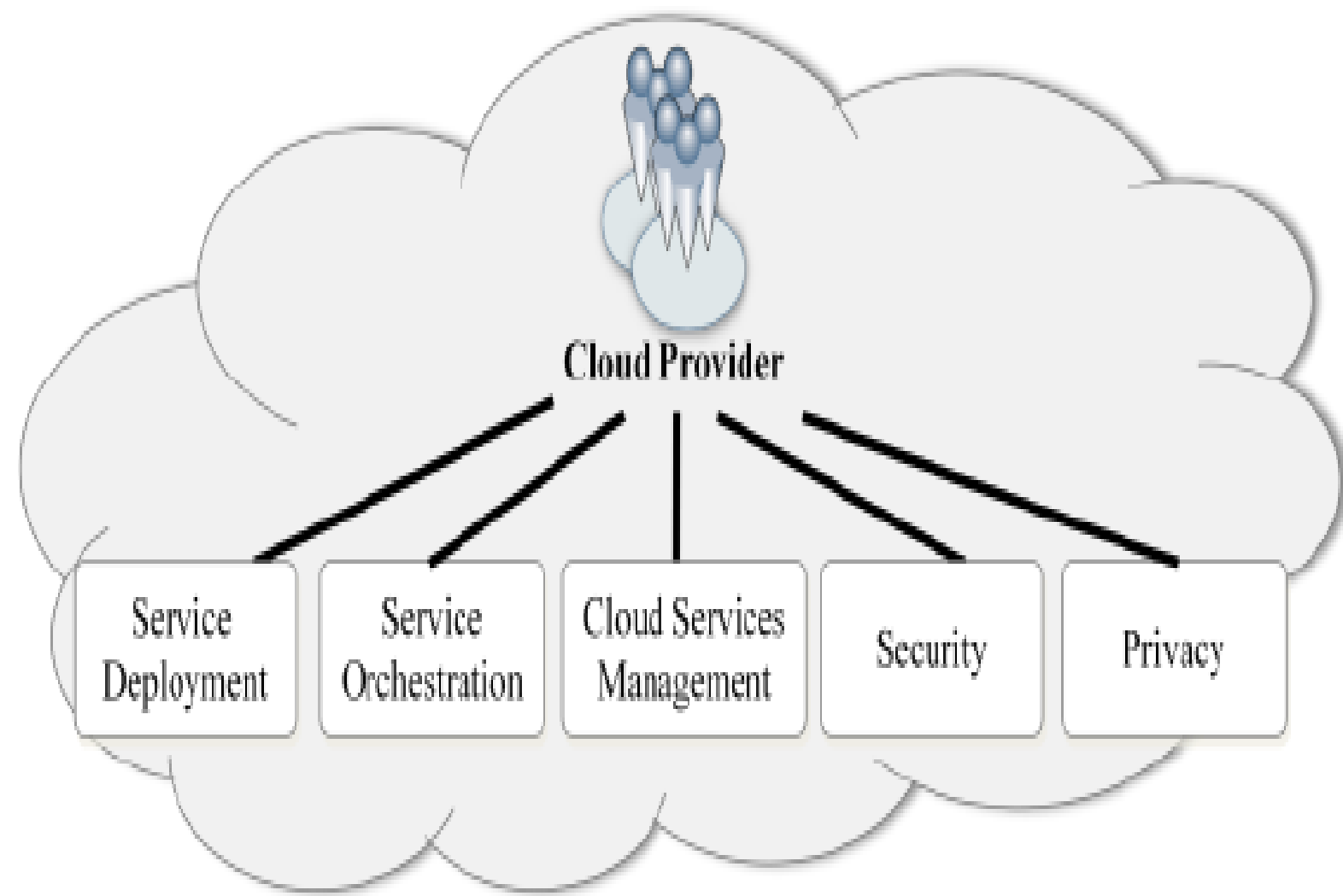
# NIST CLOUD REFERENCE ARCHITECTURE

## Cloud Consumer



# NIST CLOUD REFERENCE ARCHTECTURE

## Cloud Provider



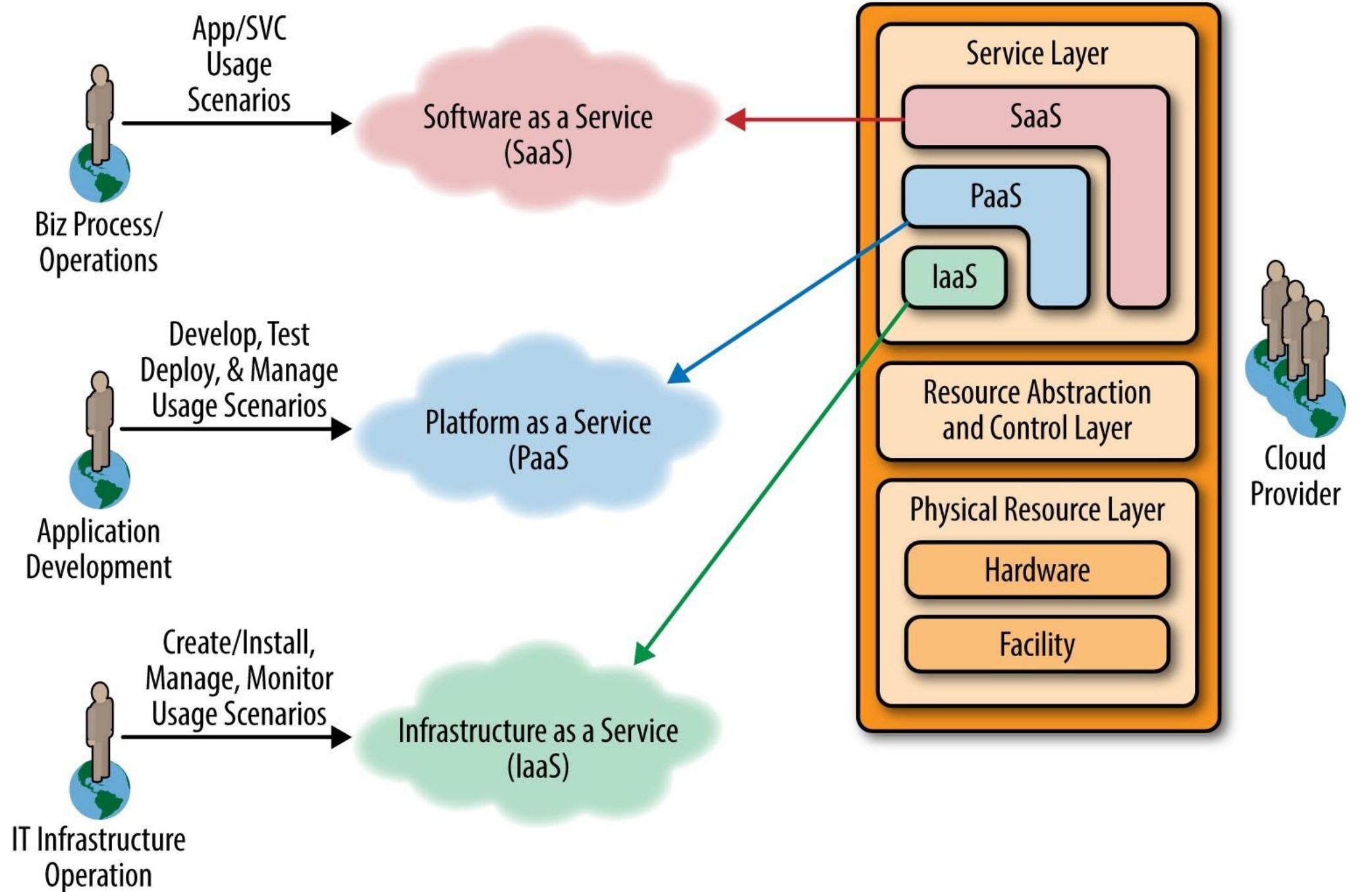
# NIST CLOUD REFERENCE ARCHITECTURE

## Service Orchestration

Composition of components to provide services to consumers

### 3 Layered Model

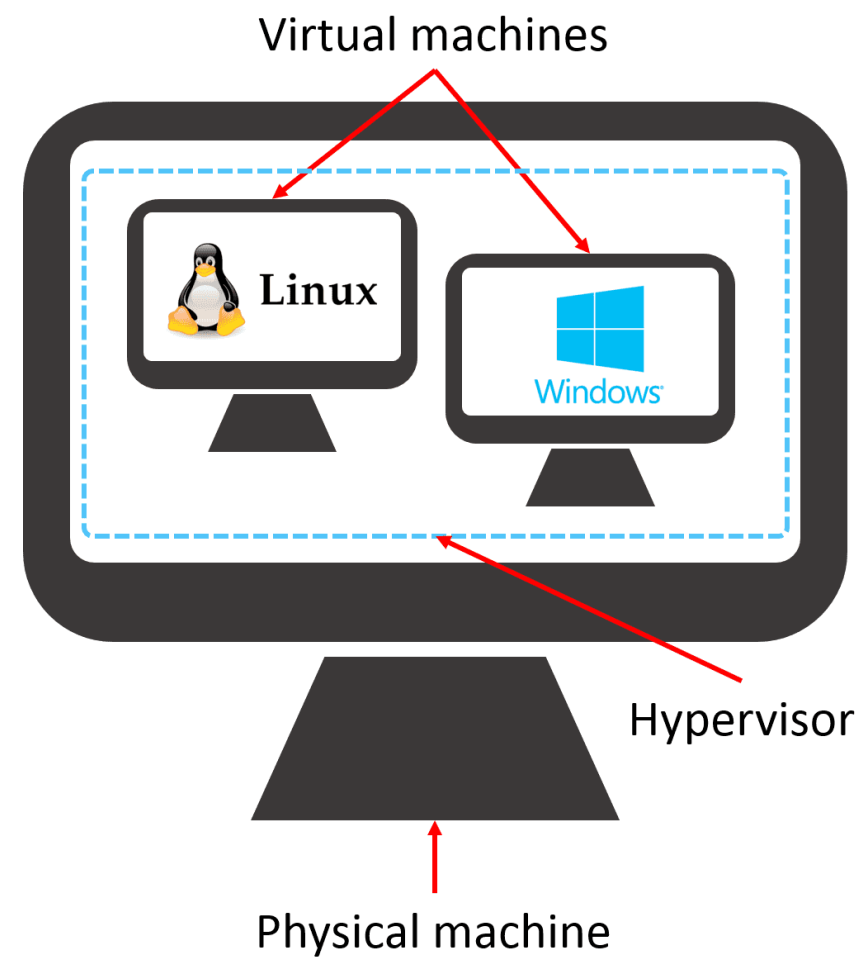
- Service Layer
- Resource Abstraction and Control Layer
- Physical Resource Layer



# NIST CLOUD REFERENCE ARCHTECTURE

## Resource abstraction and control layer

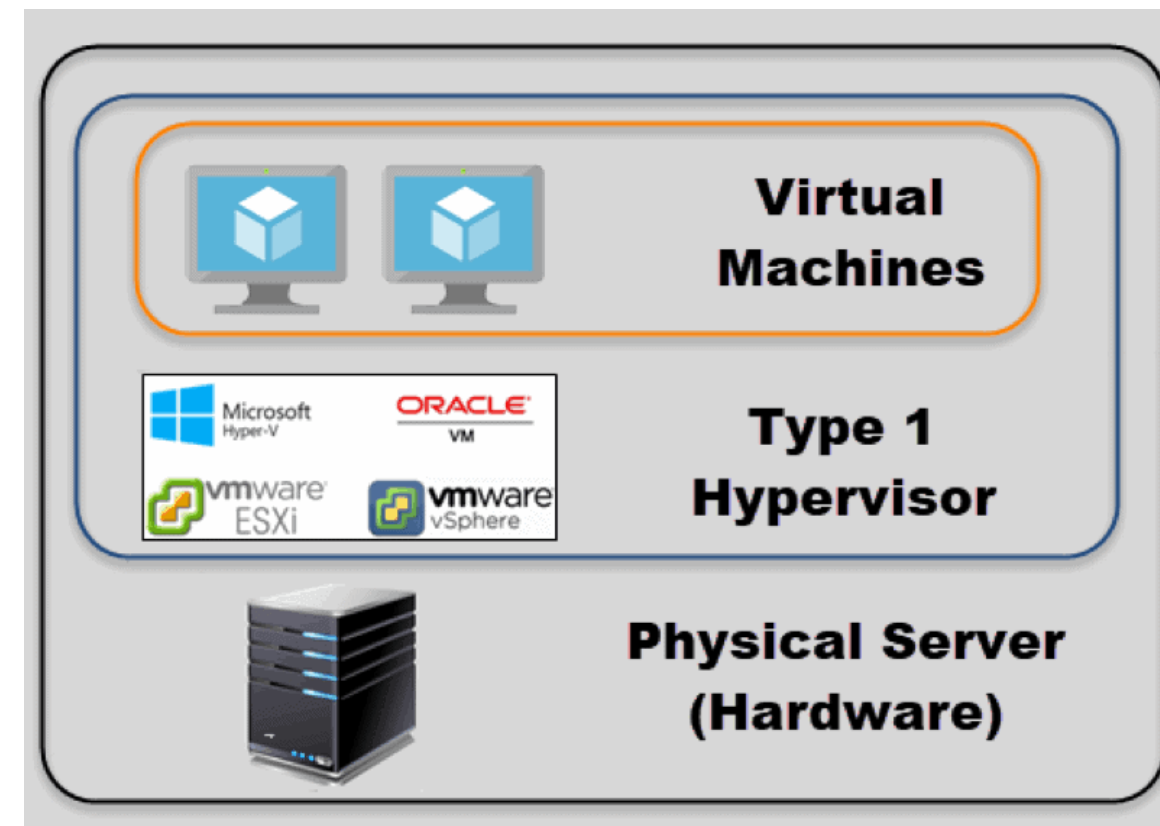
1. Resources provided through consumers through this layer
2. Uses Software Abstraction
3. Access to physical resources.



## Physical resource layer

Includes physical computing resources.  
Hardware

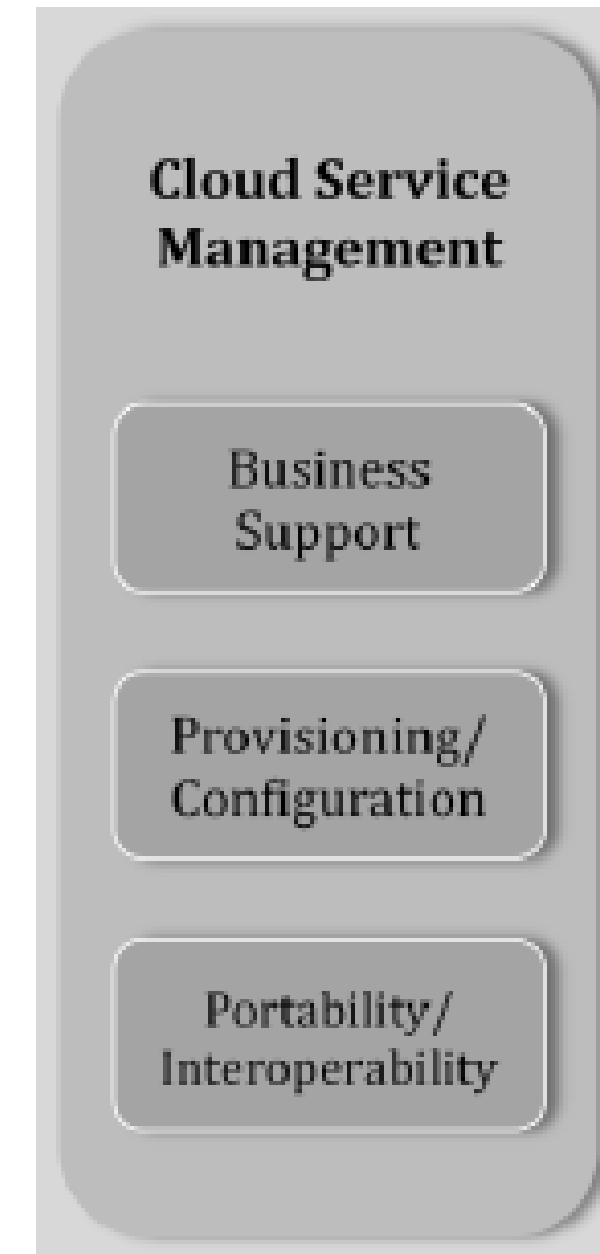
1. computers (CPU and memory),
2. networks (routers, firewalls, switches, network links and interfaces),
3. storage components (hard disks)



# NIST CLOUD REFERENCE ARCHTECTURE

## Cloud Service Management

- Service-related functions
  - necessary for the management and operation of services
1. *business support,*
  2. *provisioning and configuration,*
  3. *portability and interoperability* requirements







# NIST CLOUD REFERENCE ARCHTECTURE



## **Business support**

business-related services dealing with clients and supporting processes

1. Customer management
2. Contract management
3. Inventory Management
4. Accounting and Billing
5. Reporting and Auditing
6. Pricing and Rating

# NIST CLOUD REFERENCE ARCHTECTURE

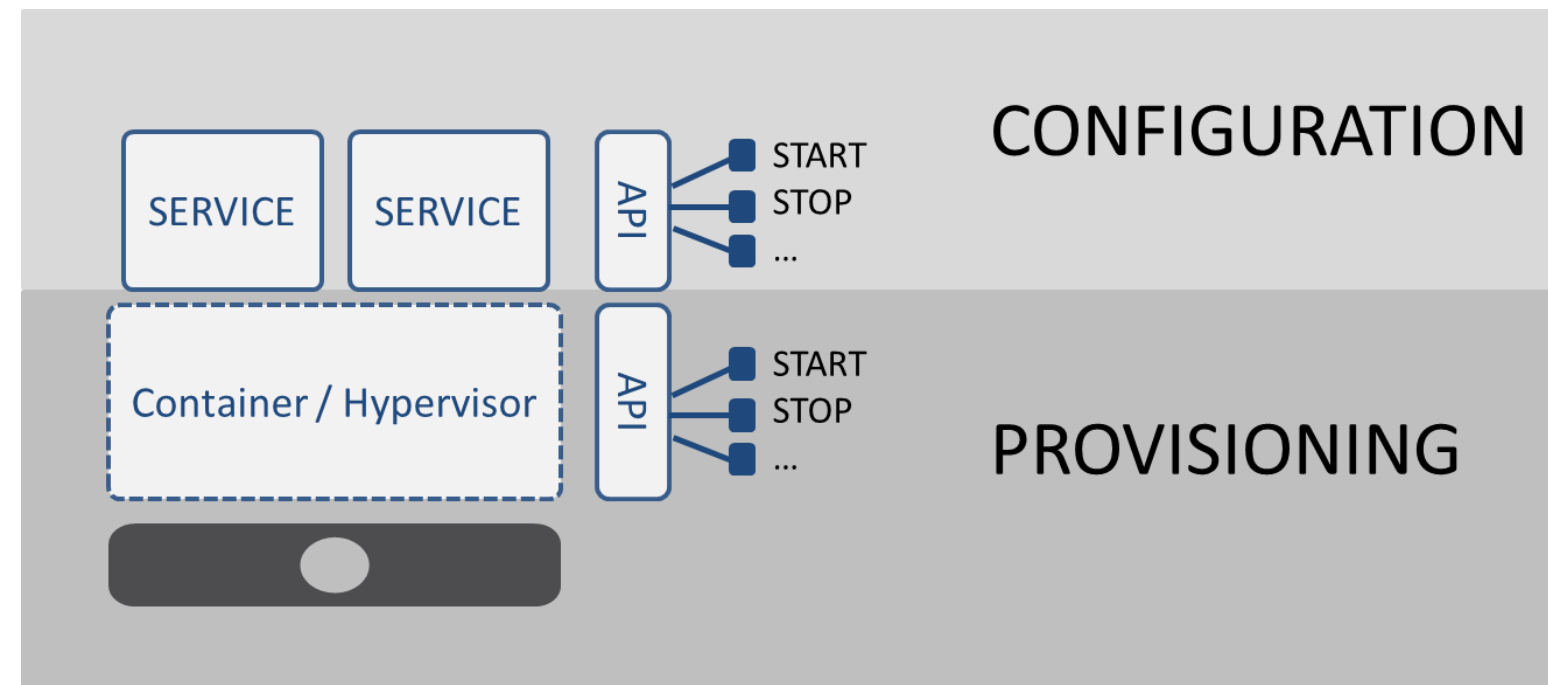
## Provisioning and Configuration

- Rapid provisioning
- Resource changing
- Monitoring and Reporting
- Metering
- SLA management

## Portability and Interoperability

provide mechanisms to support

1. Data portability,
2. Service interoperability, and
3. system portability





# NIST CLOUD REFERENCE ARCHTECTURE



## Security

Physical Security

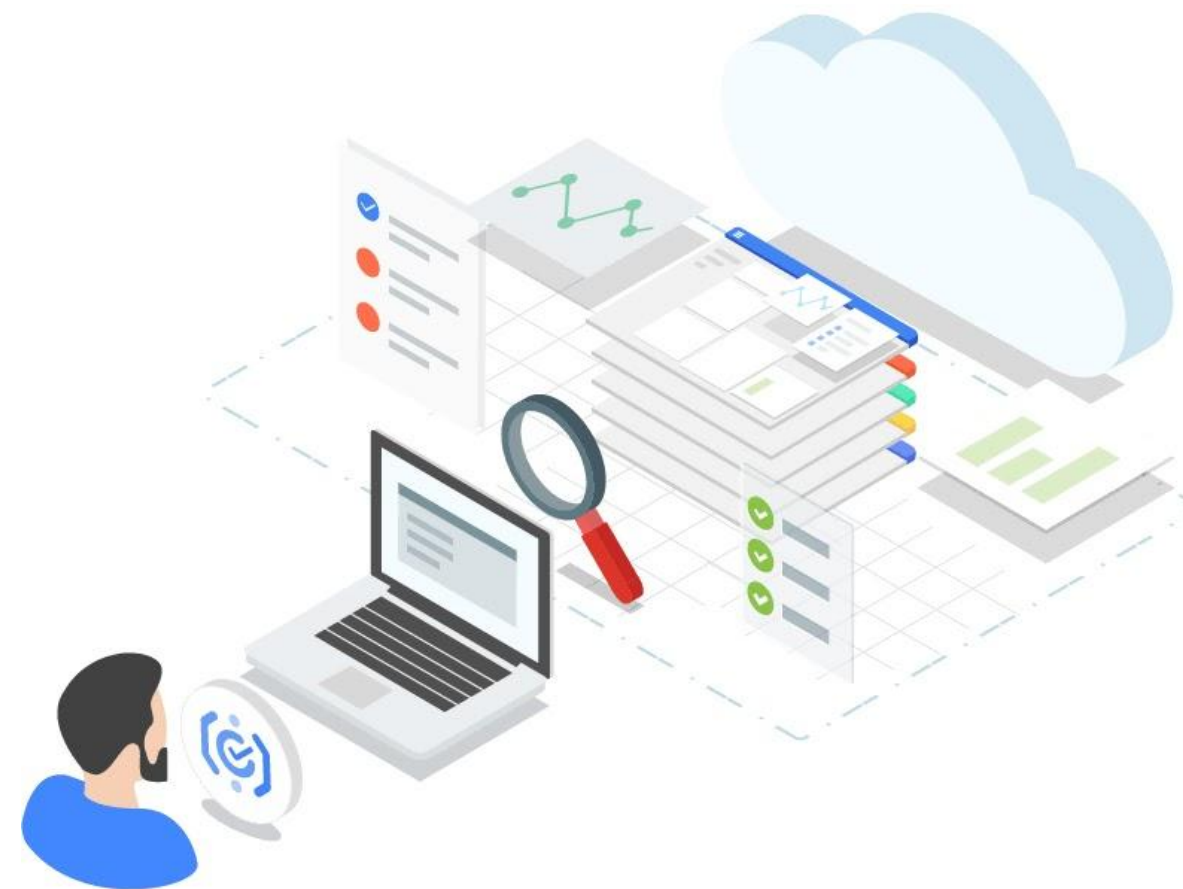
Application Security

- authentication,
- authorization,
- availability,
- confidentiality,
- identity management,
- integrity,
- audit,
- security monitoring,
- Incident response, and
- security policy
- management.

# NIST CLOUD REFERENCE ARCHTECTURE

## Cloud Auditor

- Examination of cloud service controls with the intent to express an opinion thereon
- verify conformance to standards through review of objective evidence.
- evaluate the services like security controls, privacy impact, performance, etc.
- Security Audit
- Privacy impact audit
- Performance audit

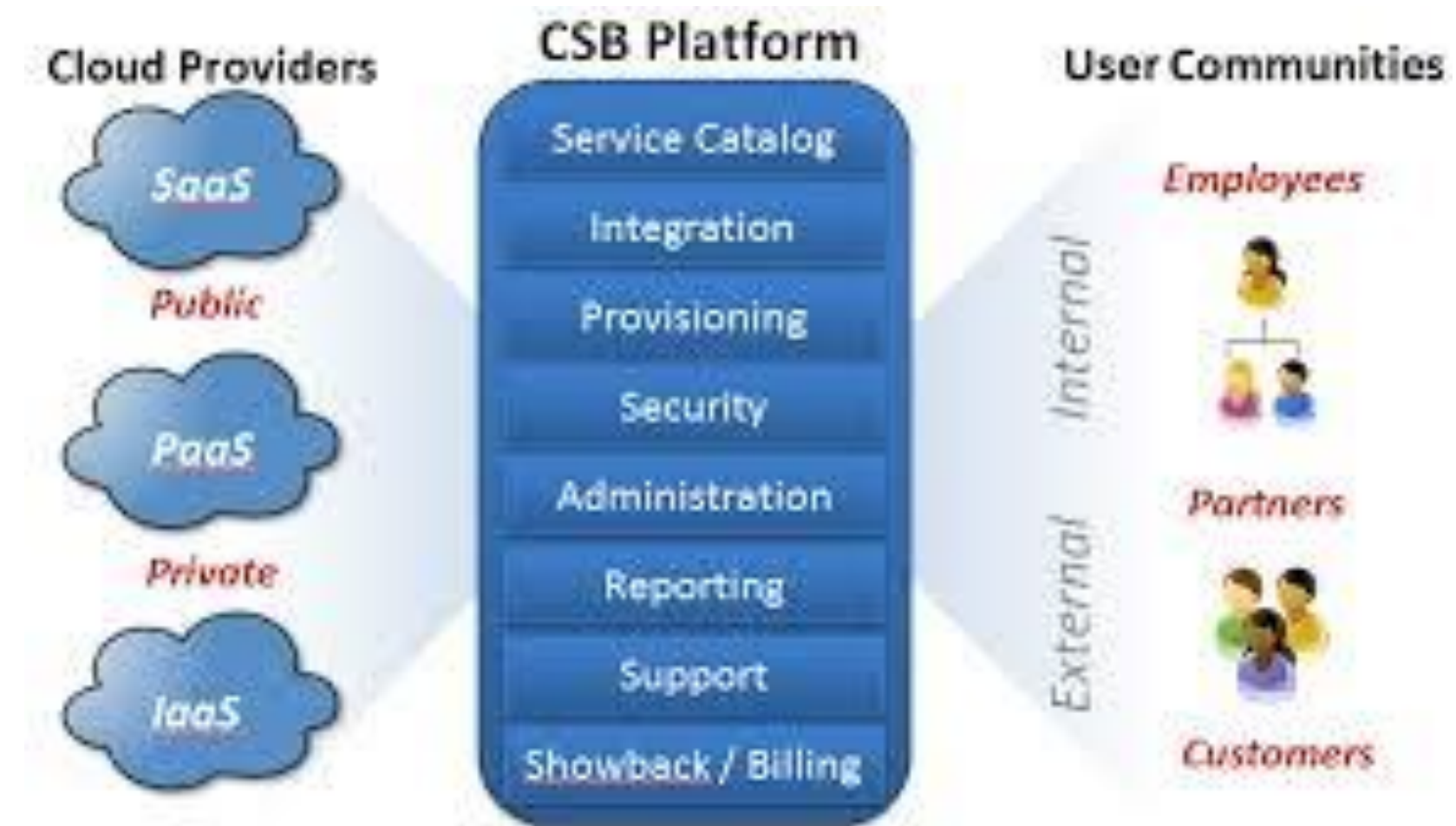


# NIST CLOUD REFERENCE ARCHTECTURE

## Cloud Broker

cloud broker is manages the use, performance and delivery of cloud services and negotiates relationships between cloud providers and cloud consumers

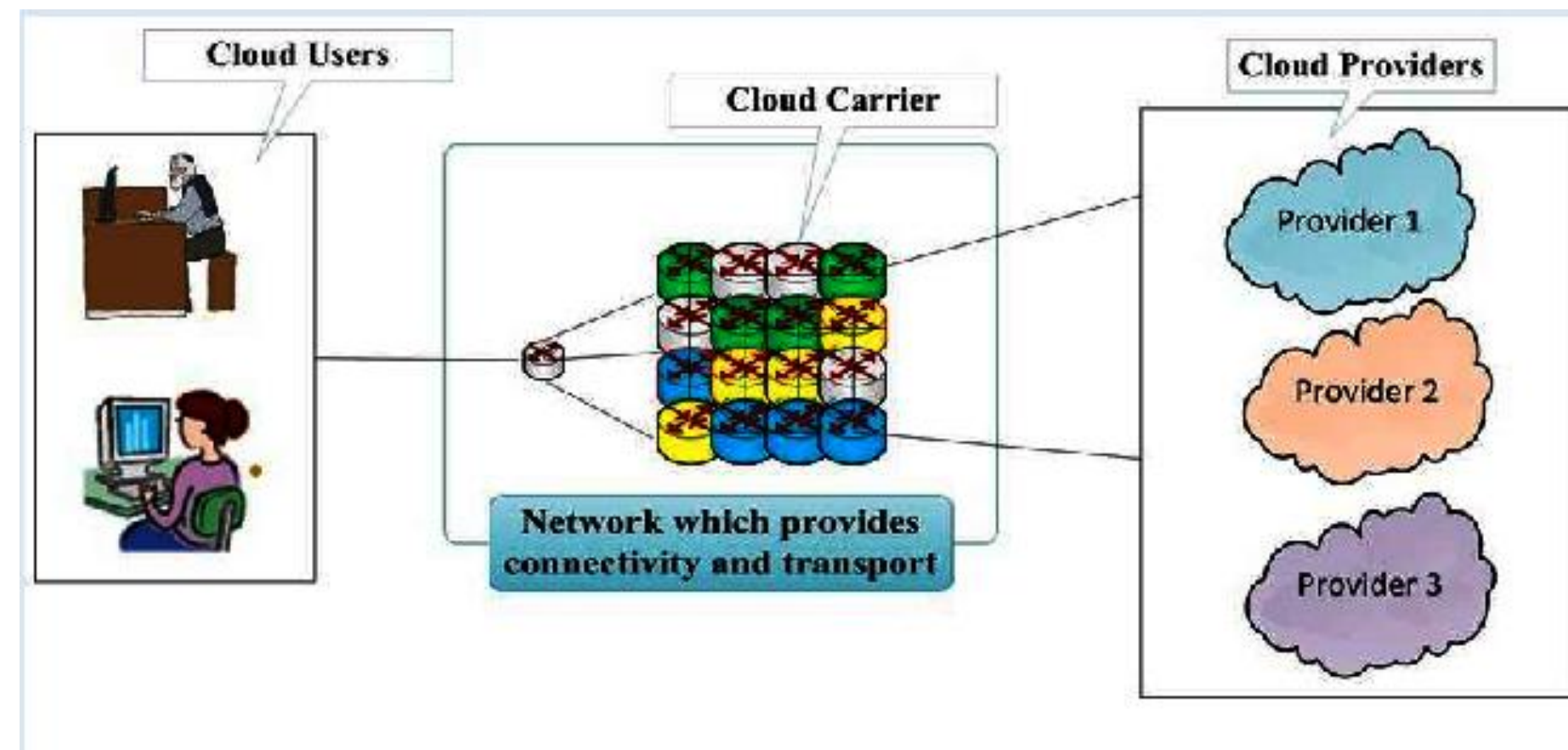
1. Service Intermediation
2. Service Aggregation
3. Service Arbitrage



# NIST CLOUD REFERENCE ARCHTECTURE

## Cloud Carrier

- an intermediary that provides connectivity and transport of cloud services between cloud consumers and cloud providers.
- provide access to consumers through network, telecommunication and other access devices.
- transport agent





**THANK YOU**