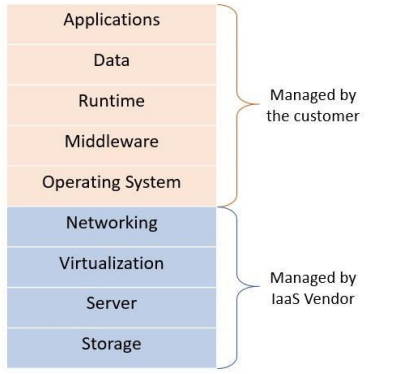
Infrastructure as a Service (IaaS)

Infrastructure as a service (IaaS) is a service provided by the cloud service provider (CSP) where they offer infrastructure i.e. virtualized computing resources that can be accessed over the internet. Thus, it is also called **hardware as a service** (HaaS).

Prior to the advent of cloud computing, companies used to build their own infrastructure which they have to maintain and upgrade with the frequently updating technology which comes with a tremendous expense.

As a solution to this, cloud vendor proposes IT infrastructure as a service that offers **storage, network, virtual machine, and servers** to their customer. On outsourcing infrastructure as a service, the customer does not have to indulge in the diligence of purchasing their own infrastructure.



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The customer doesn't even need to panic about the maintenance and updation of the infrastructure, as it is the responsibility of your cloud service provider maintain and update the infrastructure they provide to their customer.

By outsourcing the IaaS, the customer rents the storage, servers, virtual machines and the networking component using which it can access his leased hardware infrastructure. The customer can operate all his infra resources with the help of software called a hypervisor. A **hypervisor** is a special software that enables virtualization by allowing multiple operating systems on a common host system at the same time.

In IaaS, the customer can establish and maintain the operating system of his choice along with the other components such as applications, middleware, runtime and data.

Feature of IaaS

The cloud service provider's self-implied features include:

1. The cloud service providers have their self-owned computer hardware that is scalable.
2. The cloud service providers have their self-owned computer network that includes switches routers, load balancers, firewalls etc.
3. Internet connectivity which let the IaaS customers access their leased resources.
4. Cloud providers also maintain the virtualization to issue client-specified virtual machines.
5. The cloud service providers have to maintain the **service level agreement** (SLA) which encloses the negotiation between IaaS vendors and clients, that what minimum level of service will be maintained by the cloud service providers.
6. Cloud services bills you every month for the services you consumed, just like the other utility company bills their customers.

Benefits of IaaS

Benefits of outsourcing IaaS services from cloud vendors are as follows:

- **Reduces Risk**

  Outsourcing IaaS reduces the risk of data loss. IaaS vendors mirror your data on multiple servers which increases the redundancy. Even if one server fails your data is not lost.

- **Increased Availability and Scalability**

  IaaS is always available to their customers to manage high service demands. IaaS vendor ensures that the resources are always available to the customer and even the customers can freely scale up the services according to their requirement.

- **Geographical Accessibility**

  The IaaS customer can access their IaaS service from any location in the world over the internet. So geographical location is not a limitation in IaaS services.

- **Flexibility**

  IaaS allows their customer to scale their resources depending on their business requirement. IaaS service does not bind its customer with a fixed package of services. Customers can customize their own set of services.

- **Cost and Time Saving**

  Outsourcing IaaS services saves the cost and time of the customer. As the customer does not have to indulge in purchasing and setting up of an infrastructure neither he has to worry

about maintaining and updating the infrastructure with the latest technology. All this is handled by the IaaS vendor.

- **Full Control of Virtual Machine**

  The customer has full control over the virtual machines. As the customer has to provide the administrative details to operate the virtual machine or in case they have to save data over the cloud storage. Without administrative details, no one can access your resource. So the customers have full control over their leased resources.

Disadvantages of IaaS

Everything comes with its pros and cons there are some issues with the infrastructure as a service.

- **Security**

  There is always a security issue of your data in the IaaS environment. The security provided by the IaaS vendor is covered in the service level agreement (SLA). But most IaaS vendor does not assure you of 100% security in the public cloud. You may opt for a private or hybrid cloud for rendering more security.

- **Dependency**

  IaaS services can only be access by its customer over the internet which means the service is dependent on the internet. You must have an internet connection to access your IaaS resources. However, you are also dependent on the third party for your infra resources.

- **Compatibility**

  It is hard to switch your IaaS vendor as if you migrate your virtual machine it may create compatibility issues. This might leave you in the vendor lock-in problem.

- **Updation and Maintenance**

  The IaaS vendors are responsible for updating and maintaining the IT infrastructure but it does not perform any updation of software, applications, tools and data system.

- **Data Deletion**

  Whenever a customer ends up his services with the IaaS vendor, the IaaS vendor must ensure that the resources released by the previous customer leave no residue for the next customer who rents the same resource.

Examples of Infrastructure as a Service (IaaS)

- Google Compute Engine (GCE)
- Amazon Web Services (AWS)
- Rackspace
- Microsoft Azure
- Digital Ocean