# **Cloud Platform Programming**

# Assignment

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Question 1:

We have already studied the three core cloud service models — Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

Beyond these, many other "*X-as-a-Service*" models exist in the cloud ecosystem. Your task is to:

* Identify **at least 15 different "X-as-a-Service" models** apart from IaaS, PaaS, and SaaS.
* For **each model**, list the **top three companies/providers** offering that service.

# *Cloud Service Models:*

The cloud services model defines the control, management, and level of utilization of cloud services. There are three main types of cloud service models.

1. Infrastructure as a service (IaaS)
2. Platform as a service (PaaS)
3. Software as a service (SaaS)

Apart from these three main service model types, there are many other **X as a service** models, which means anything as a service we are using from the cloud. Some of them are listed below that provide different services

***1)Function as a service:***

This is a cloud service model that gives us a platform to run code units without managing the underlying cloud infrastructure. Some companies that provide this service are listed below.

* Cloud Run Functions
* Azure Functions
* Open FaaS.

***2) Container as a Service:***

This is a cloud service model that gives us a platform for deploying and managing containers without having to manage the underlying infrastructure. In this, we deploy a containerlized application and its data on a preferred CaaS solution. Some companies that provide this service are listed below.

* Amazon Elastic Container Service,
* Microsoft Azure Container Instances
* Google Cloud Container Builder

***3)Network as a Service:***

This is a cloud-based model that allows organizations to access and manage networking resources on demand without owning physical infrastructure. Below are some practical examples of NaaS offerings and their applications

* Cloudflare
* Juniper network as a service
* Perimeter 81

***4)Database as a Service:***

This is a cloud computing service that provides users with access to a managed database system without the need to purchase, configure, or maintain the underlying hardware and software. Below are some of the companies providing this service

* Amazon RDS
* Microsoft Azure SQL database
* Mongo DB Altas

***5)Communication as a Service***:

This is the **cloud-based communication model** that provides businesses with access to a comprehensive suite of communication tools through the internet. Some companies providing the services are listed below.

* Nextiva
* Cisco Unified Communications Manager (CUCM)
* RingCentral

***6)Hardware as a Service:***

Hardware as a service is a model where a business rents or leases the hardware it needs from the service provider on a subscription basis rather than purchasing it outright. Some companies providing the services are listed below.

* [Microsoft Corporation](https://www.microsoft.com/en-in)
* [Lenovo](https://www.lenovo.com/in/en/?srsltid=AfmBOoqVZKktseeLEglnQw0xP2mcGi99O-mWHkqHam7APtajlI7Qy0-G)
* [Amazon Web Services](https://aws.amazon.com/)

***7)Desktop as a Service :***

Desktop as a Service is a model that delivers virtual desktops to users over the internet. It eliminates the need for physical storage by hosting infrastructure, network resources, and storage in the cloud. Some companies providing the services are listed below.

* Elastic Desktop Service
* Amazon AppStream 2.0
* Accops Daas

***8)Security as a Service:***

This is the service model that deliver the security services over the internet. Rather then buying complex security infrastructure, organizations subscribe to these services from a third-party provider. Some companies providing the services are listed below.

* CrowdStrike
* SecureWorks
* Zscaler

***9)Disaster Recovery as a Service:***

This service provides cloud based solution for backing up and restoring data in event of a disaster. Some companies providing the services are listed below.

* Microsoft Azure
* VMWare
* iland

***10)Data as a Service***:

This service delivers data and data analytics services over the internet. Some companies providing the services are listed below.

* AWS Data Exchange
* GOOGLE Cloud
* Microsoft Azure

***11)Testing as a Service:***

These models provide testing tools and services for software quality assurance. Some companies providing the services are listed below.

* Lambda test
* Browser Stack
* Sauce Lab

***12)Backend as a Service:***

These models offer the backend services for mobile and web applications such as user authentication and data storage. Some companies providing the services are listed below.

* AWS Amplify
* Backendless
* Firebase(Google)

***13)Identity as a service:***

These models manage user identities and access to applications. Some companies providing the services are listed below.

* OneLogin
* Azure Active Directory
* Ping Identitys

***14) Monitoring as a service:***

These models provide the tools for monitoring IT infrastructure and applications. Some companies providing the services are listed below.

* Datadog
* App Dynamics
* Dynatrace

***15) AI as a Service:***

These models offer AI capabilities such as machine learning and natural language processing through the cloud. Some companies providing the services are listed below.

* AWS AI Services
* Microsoft Azure AI
* IBM Watson

Question 2:

* Choose one cloud provider (AWS, Azure, GCP, or OCI).
* Identify and analyze **two services** offered under each model (IaaS, PaaS, SaaS).
* Critically evaluate: *How would these services benefit a start-up vs. a large enterprise?*

Here, I would like to choose Microsoft Azure.

# Microsoft Azure:

Microsoft Azure is a cloud computing platform that offers a vast collection of services to users, including computing, analytics, storage, networking, and AI to build, run, and manage applications, eliminating the need for organizations to manage their own physical hardware. Azure supports various cloud service models, including IaaS, PaaS, and SaaS.

**IaaS (Infrastructure as a Service):**

Microsoft Azure allows users to deploy and manage virtual machines, virtual networks, and storage, providing users with complete control over their cloud computing environment. Microsoft Azure services under IaaS are,

1. **Azure Virtual Machines:**

This service provides on-demand, scalable virtual machines in the cloud.

* Start-ups can quickly set up virtual machines for development, testing, and production environments without the need for physical servers.
* Large enterprises can leverage Azure Virtual Machines to scale their infrastructure, support complex workloads, and maintain control over their operating systems and applications.

1. **Azure Virtual Network:**

This service enables users to create private networks in the cloud and allows them to isolate their resources and control network traffic.

* Start-ups can use Azure Virtual Network to create secure and isolated environments for their applications
* Large enterprises can use it to extend their on-premises networks to the cloud, facilitating hybrid cloud deployments and secure connectivity.

**PaaS (Platform as a Service):**

Microsoft Azure is allowing developers to build and deploy applications without worrying about managing the underlying infrastructure, operating systems, or maintenance tasks and backups. Microsoft Azure services under PaaS are.

1. **Azure App Service:**

This service enables developers to build, deploy, and scale web, mobile, and API apps.

* Start-ups can quickly deploy their applications without managing the underlying infrastructure, allowing them to focus on coding and innovation.
* Large enterprises can use Azure App Service to streamline application development, support containerized applications, and ensure high availability and scalability

1. **Azure SQL Database:**

This is a fully managed database service that provides a relational database as a service.

* sssStart-ups can use Azure SQL Database for their data storage needs, eliminating the need to manage database servers.
* Large enterprises can leverage Azure SQL Database to modernize their database infrastructure, improve performance, and scale their databases to meet growing demands.

**SaaS (Software as a Service):**

Microsoft Azure offers tools for developers to build and deploy their own SaaS applications using Azure's cloud infrastructure. Customers access applications over the internet through a subscription, eliminating the need for local installation and maintenance. Microsoft Azure services under SaaS are,

1. **Microsoft 365:**

This suite of productivity and collaboration tools includes applications like Word, Excel, and Teams.

* Start-ups can use Microsoft 365 for their communication and collaboration needs, enhancing productivity and teamwork.
* Large enterprises can use Microsoft 365 to streamline their workflows, ensure data security, and improve collaboration across teams.

1. **Dynamics 365:**

This is a suite of business applications that includes CRM, ERP, and other business process solutions.

* Start-ups can use Dynamics 365 to manage their customer relationships, streamline their operations, and gain insights into their business.
* Large enterprises can leverage Dynamics 365 to transform their business processes, improve customer experiences, and gain a competitive advantage.

For start-ups, Azure services provide agility, cost-effectiveness, and scalability, enabling rapid development and deployment and allowing start-ups to focus on innovation without the burden of managing physical infrastructure. For large enterprises, these services offer robust scalability, security, and integration capabilities to enhance their existing infrastructure, improve operational efficiency, and support complex applications. Additionally, large enterprises benefit from compliance and governance features that Azure provides, ensuring that they meet industry regulations.