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PARULINSTITUTEOF ENGINEERING &TECHNOLOGY
FACULTY OF ENGINEERING & TECHNOLOGY
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Subject: Azure Fundamentals

Unit 1 : Cloud Concepts

Computer Science & Engineering

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DIGITAL LEARNING CONTENT

Azure Fundamentals Btech, 5th Semester

Prerequisite: Basic understanding of computer concepts and basic programming

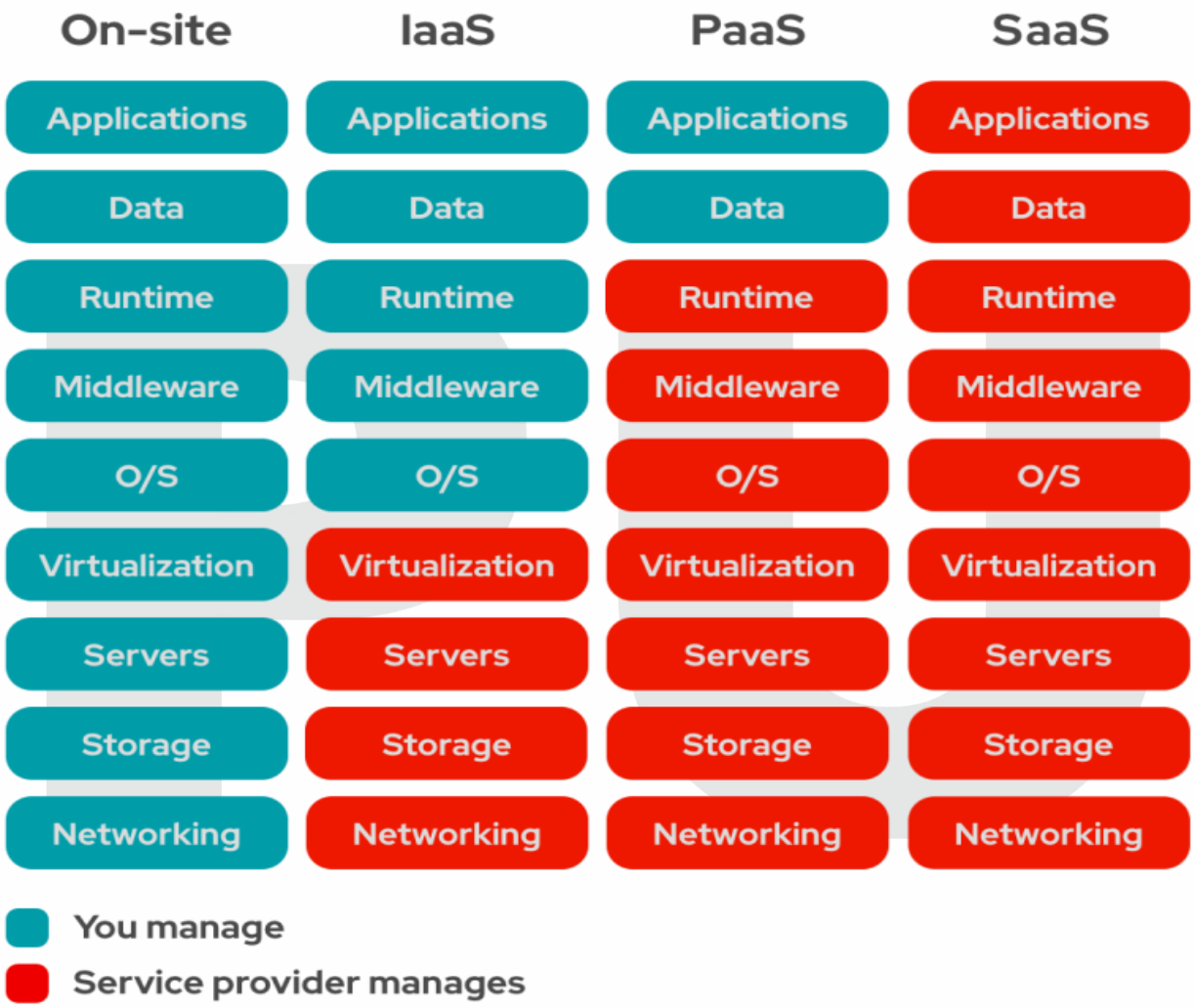
Rationale: This course provides a broad introduction to Azure cloud , infrastructure , services, security and compliance ,also billing , pricing and support plans.

Why Cloud Computing?

- Organizations can access and share resources such as networking, servers, databases, and storage through the internet, making the whole process faster, more efficient, cost-effective and flexible.
- Cloud computing makes it easier for organizations to store, access, manage and process data efficiently.
- Simply put, cloud computing uses hardware and software that resides in the Cloud, through the internet, to perform various complex organizational activities.
- In traditional business structures, all the data used to be stored in local machines and hard drives. With cloud computing, all the data is stored in virtual servers provided and maintained by third-party service providers.

Cloud Technology Services are of Three Types:

- **IaaS** (Infrastructure as a Service)
- **SaaS** (Software as a Service)
- **PaaS** (Platform as a Service)


On-site
IaaS
PaaS
SaaS
Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking
You manage
Service provider manages

What is Iaas?

- For example, through virtualization technology, the provider hosts infrastructural components such as virtual machines, virtual LANs, networks, storage, hard drives, etc.
- IaaS (infrastructure as a service) describes the provision of infrastructure and computing resources as a service.
- IaaS (includes all the physical computing resources that facilitate the delivery of apps as a service).
- IaaS is also known as HaaS (hardware as a service).
- Amazon Web Services (AWS) is one of the best IaaS examples. Cisco Metapod, Microsoft Azure, and Google Compute Engine (GCE) are also some example of IaaS.

The IaaS Delivery Model:

- The IaaS provider provides his client with either a dashboard or an API. Then, it allows access to the end-user to all the services.
- This way, the end-user has complete control over the entire infrastructure. Along with infrastructural services, the provider will supply accompanying services.
- These services, at last, will be rendered to support this infrastructural assistance. Some examples of these services are detailed billing, load balancing, and clustering, log access.
- In addition to all the above, the IaaS provider will enable data-storage-related services such as data back-up, replication, and recovery.

Examples of IaaS:

- Microsoft Azure
- Amazon Web Services
- Google Compute Engine
- Cisco Metapod
- Joyent
- OpenStack

Applications of IaaS:

IaaS is used in the following scenarios in the current business environment:

- Development environment
- Testing environment
- Data storage
- Data Analytics

Advantages of IaaS:

- IaaS provides many benefits to clients planning to migrate their organizations to cloud technologies. Some of the key advantages include:
- The IaaS also provides the advantage of scalability for the clients meaning that they can upgrade or downgrade services with a simple click of a button.
- IaaS can help clients obtain the needed infrastructure within a short period. This will eliminate any time lag in procurement. The organization can carry out necessary tests quickly and deliver results on time.
- IaaS reduces the costs of buying, setting up and managing new and expensive hardware. IaaS as a service is also available on a subscription basis. All these features help the client cut down on substantial upfront expenses.

What is SaaS:

- As the name suggests, SaaS, or Software as a Service, is a cloud technology service where the SaaS provider hosts various applications on the Cloud and makes them available to customers over the internet.

- SaaS is also known as cloud application services and is one of the most commonly used cloud services.

- Apart from making the application available to the end-users, the SaaS provider will also be responsible for providing services such as managing the client's data, storage, and the application's updates.

- Furthermore, most of the SaaS applications will run on web browsers directly.
- This means the end-users will just need a computer with an internet connection and a browser to access the applications.

Applications of SaaS:

In the modern organizational context, the SaaS model can find applications in the following fields:

- Sales Management.
- Customer Relationship Management.
- Sales Management
- Human Resource Management.
- Financial Management.
- Email and collaboration management.

Examples of SaaS:

- Troop Messenger (Internal Team Messaging Application)
- Google Apps (Business Collaboration Tools)
- SalesForce Development (Cloud Computing Solutions For Business) or (Customer Relationship Management)
- Cattle call (enterprise video communications)

What is PaaS:

- PaaS meaning Provider as a Service, is a cloud technology service where the service provider provides a platform to the client or the end-user for software creation.

- A PaaS provider will provide platform-related infrastructure components such as storage, servers, operating systems, and networking equipment. The provider is also responsible for configuring and maintaining all the above features.

- In addition, the providers also provide the client with services such as programming languages, database management systems, libraries, etc.

Applications of PaaS:

PaaS can find applications in certain kinds of scenarios that include:

- Application designing, development, testing, and deployment
- Database Integration
- Web service integration

PaaS Examples:

- Microsoft Azure
- Amazon web services- Elastic Beanstalk
- Google App Engine
- Openshift
- SalesForce – Force.com

Advantages of PaaS:

- The PaaS model provides developers with a simple and cost-effective platform to develop and deploy their applications.
- Developers can concentrate fully on application development and deployment, improving overall performance efficiency.
- PaaS is beneficial when multiple developers have to work on an application from multiple locations.
- The PaaS model also provides the developer with various tools and services that help them through the app design, development, testing and deployment in an easily accessible manner.
- Scalability, reduced costs, reduced time lags, and overall improved output is among the other advantages of the PaaS model.

Real-world applications of cloud computing.

Online Data Storage : Cloud computing allows storing data like files, images, audios, and videos, etc on the cloud storage.

Backup and Recovery : Cloud vendors provide security from their side by storing safe to the data as well as providing a backup facility to the data.

Bigdata Analysis : We know the volume of big data is so high where storing that in traditional data management system for an organization is impossible.

Testing and development : Setting up the platform for development and finally performing different types of testing to check the readiness of the product before delivery requires different types of IT resources and infrastructure.

Real-world applications of cloud computing.

Anti-Virus Applications : Previously, organizations were installing antivirus software within their system even if we will see we personally also keep antivirus software in our system for safety from outside cyber threats.

E-commerce Application : Cloud-based e-commerce allows responding quickly to the opportunities which are emerging.

Cloud computing in education : Cloud computing in the education sector brings an unbelievable change in learning by providing e-learning, online distance learning platforms, and student information portals to the students.

Real-world applications of cloud computing.

E-Governance Application : Cloud computing can provide its services to multiple activities conducted by the government.

Cloud Computing in Medical Fields : In the medical field also nowadays cloud computing is used for storing and accessing the data as it allows to store data and access it through the internet without worrying about any physical setup.

Entertainment Applications : Many people get entertainment from the internet, in that case, cloud computing is the perfect place for reaching to a varied consumer base. Therefore different types of entertainment industries reach near the target audience by adopting a multi-cloud strategy.

Let's try to understand this using a real life example – **Modes of Transport !**

SaaS:

Government bus or train as a mode of transport – where you just catch and go on your Journey.

You are directly using the service provided by the government.

PaaS:

•Using Cab like Uber as a mode of transport. In this case you are calling the cab services to be at your service.
•Patrol and maintenance and other things will be taken care by the cab provider.

IaaS:

Renting a Car where you are responsible for driving, patrol and its maintenance.

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Thank You!!!

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