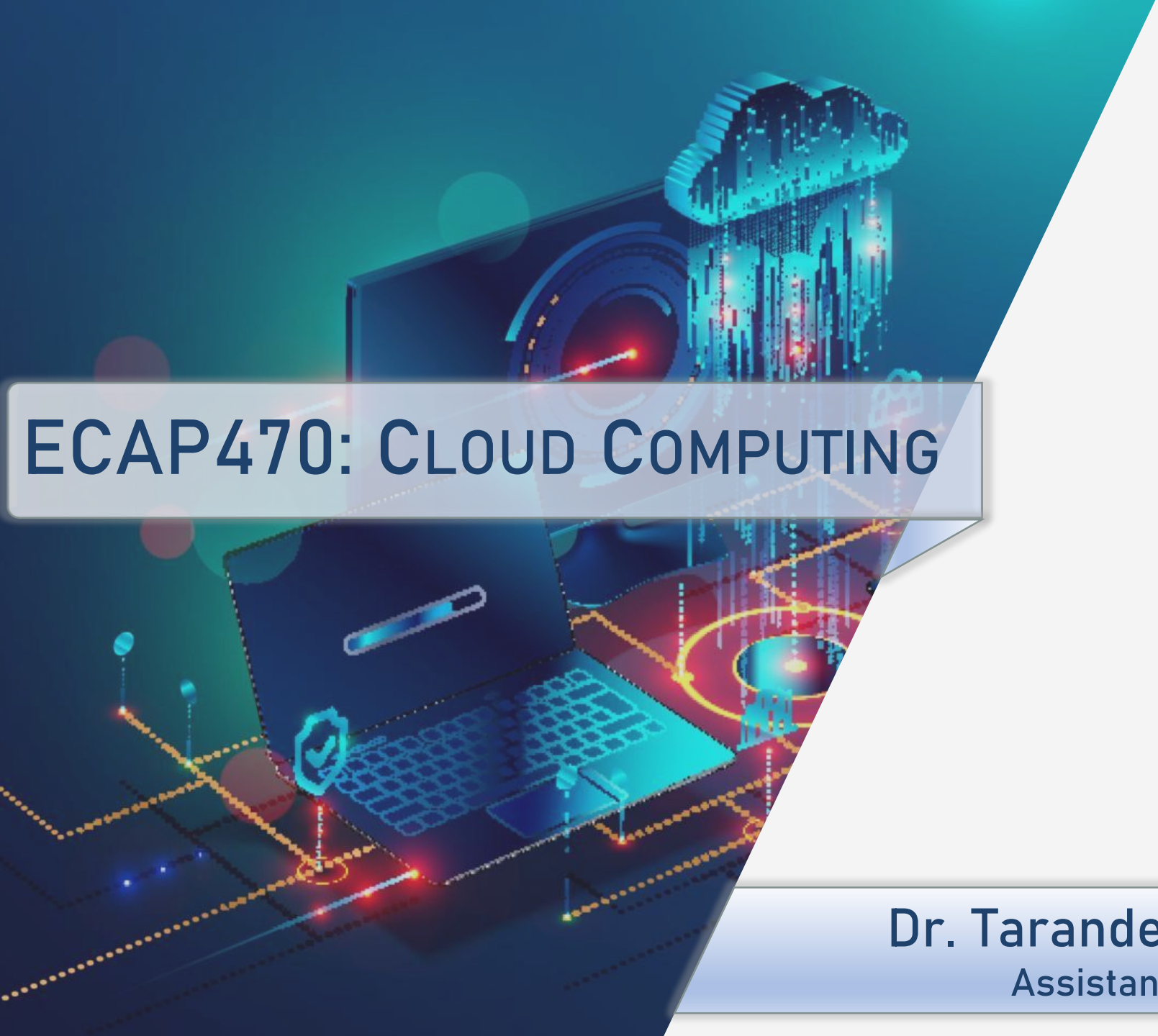


ECAP470: Cloud Computing

Dr. Tarandeep Kaur
Assistant Professor

Learning Outcomes

After this lecture, you will be able to,

- ✓Learn about the cloud services and their types.
- ✓Explore Software as a Service, Platform as a Service, Infrastructure as a Service.

Cloud Services

Any IT services that are provisioned and accessed from a cloud computing provider.

Incorporates all delivery and service models of cloud computing and related solutions.

Cloud Services

- Delivered over the internet and accessible globally from the internet.
- Describe how the services delivery is carried out in cloud computing.
- Indicate the topological layouts for the cloud computing.
- The entities basically correspond to the operational components in cloud computing.

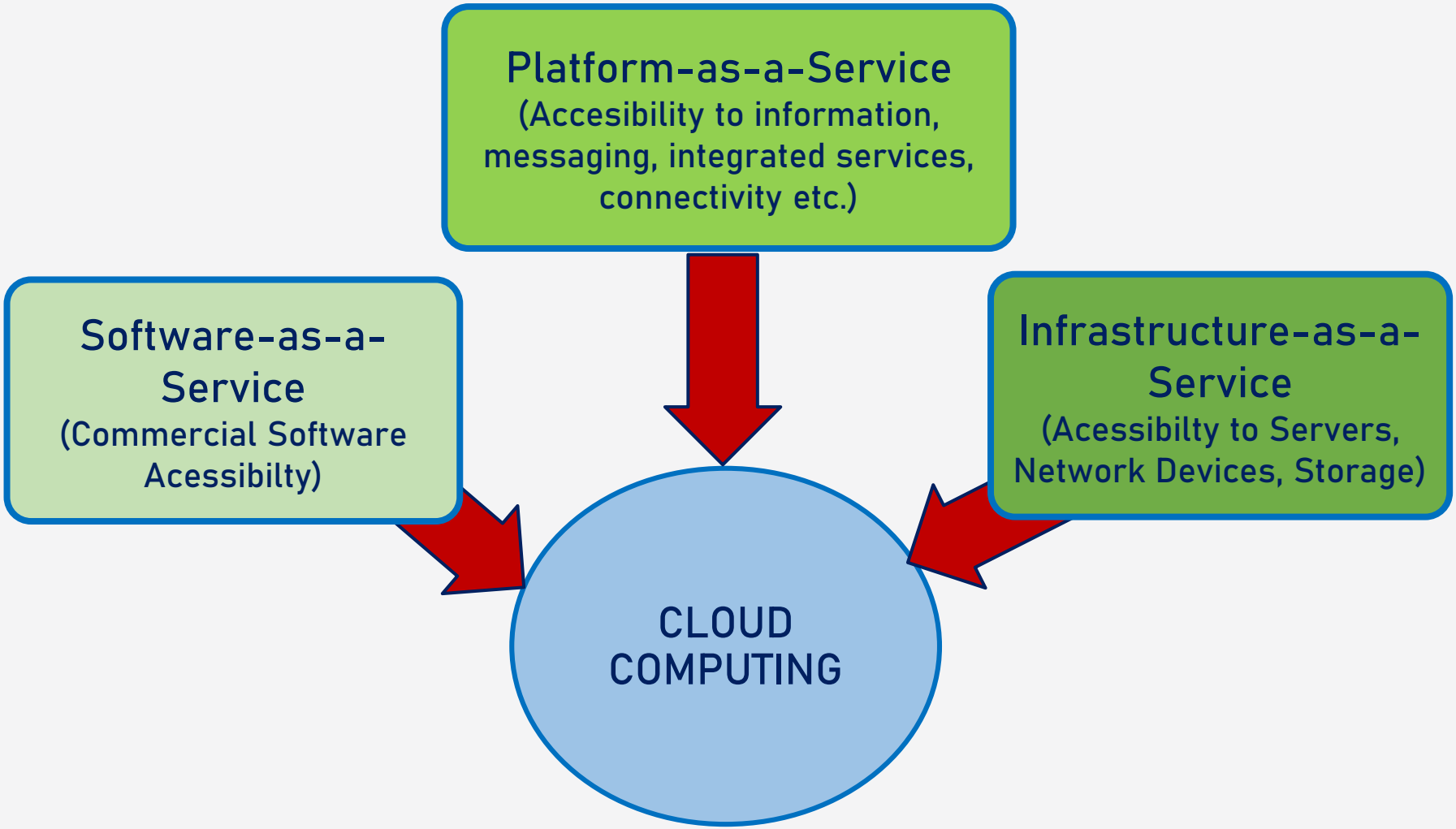
Cloud Services

- Cloud services provide great flexibility in provisioning, duplicating and scaling resources to balance the requirements of users, hosted applications and solutions.

Classification of Cloud Services

- Two high levels of classifications, namely, Archetypal and Hybrid cloud service models.
- Classic or archetypal category pertains to the three original cloud service models,
  - Software-as-a-Service (SaaS)
  - Platform-as-a-Service (PaaS)
  - Infrastructure-as-a-Service (IaaS)

Classic Cloud Service Models



Hybrid Cloud Service Models

- Driven by the need for more flexibility and control on the deployment of their applications, hybrid models emerged.
- Consolidation of PaaS and IaaS models.

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How to Pick a Cloud Service Model?

- Cloud computing is a general term used to identify online delivery of data storage, processing, analytics, and other services, online without being dependent on local hardware.
- In order to decide, let's take a deeper look at the main types of cloud-based services and examine their features and differences.

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Infrastructure-as-a-Service (IaaS)

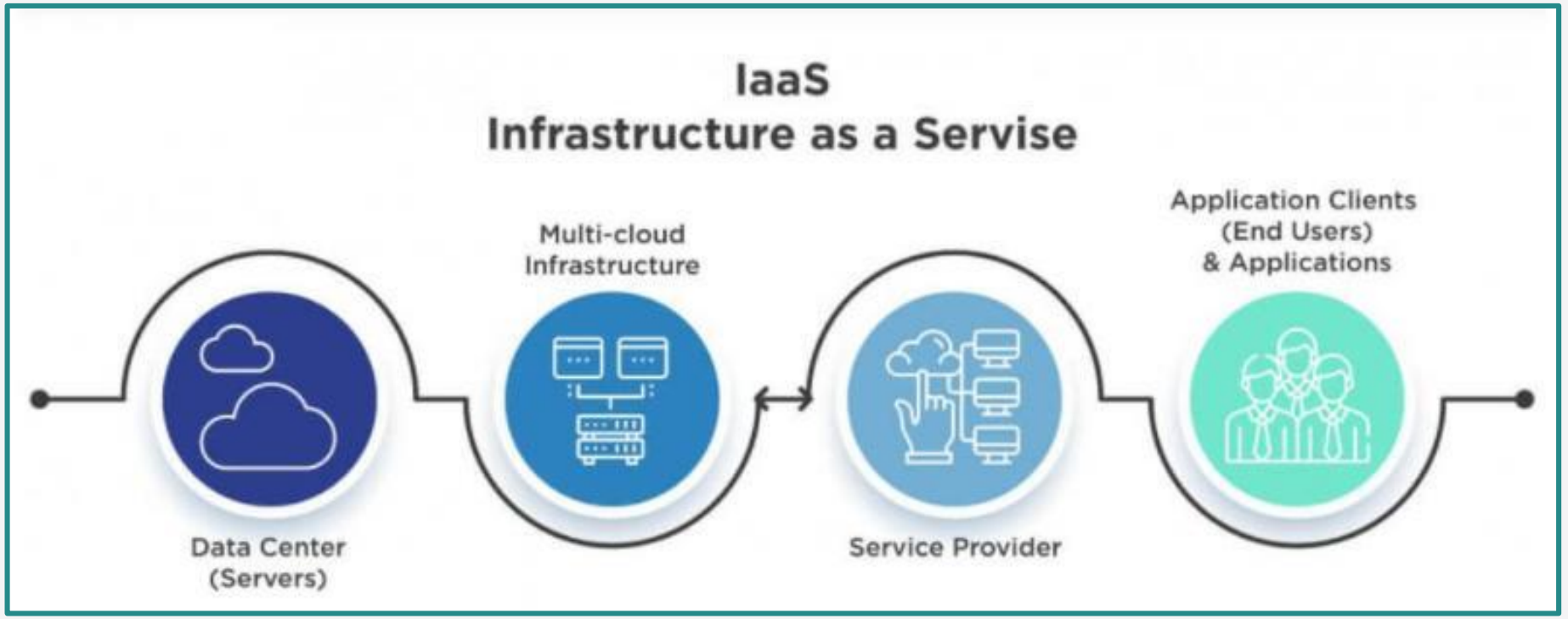
Form of cloud computing that provides virtualized computing resources (Virtual servers with CPU, memory, storage, network access, etc.) over the Internet.

Infrastructure-as-a-Service (IaaS)

IaaS also offers:

- Virtual Server Space
- Network Connections
- Bandwidth
- IP addresses
- Load Balancers etc

Infrastructure-as-a-Service (IaaS)



Infrastructure-as-a-Service (IaaS)

- Physically, the pool of hardware resource is pulled from a multitude of servers and networks usually distributed across numerous data centers, all of which the cloud provider is responsible for maintaining.
- Also known as Hardware as a Service (HaaS).

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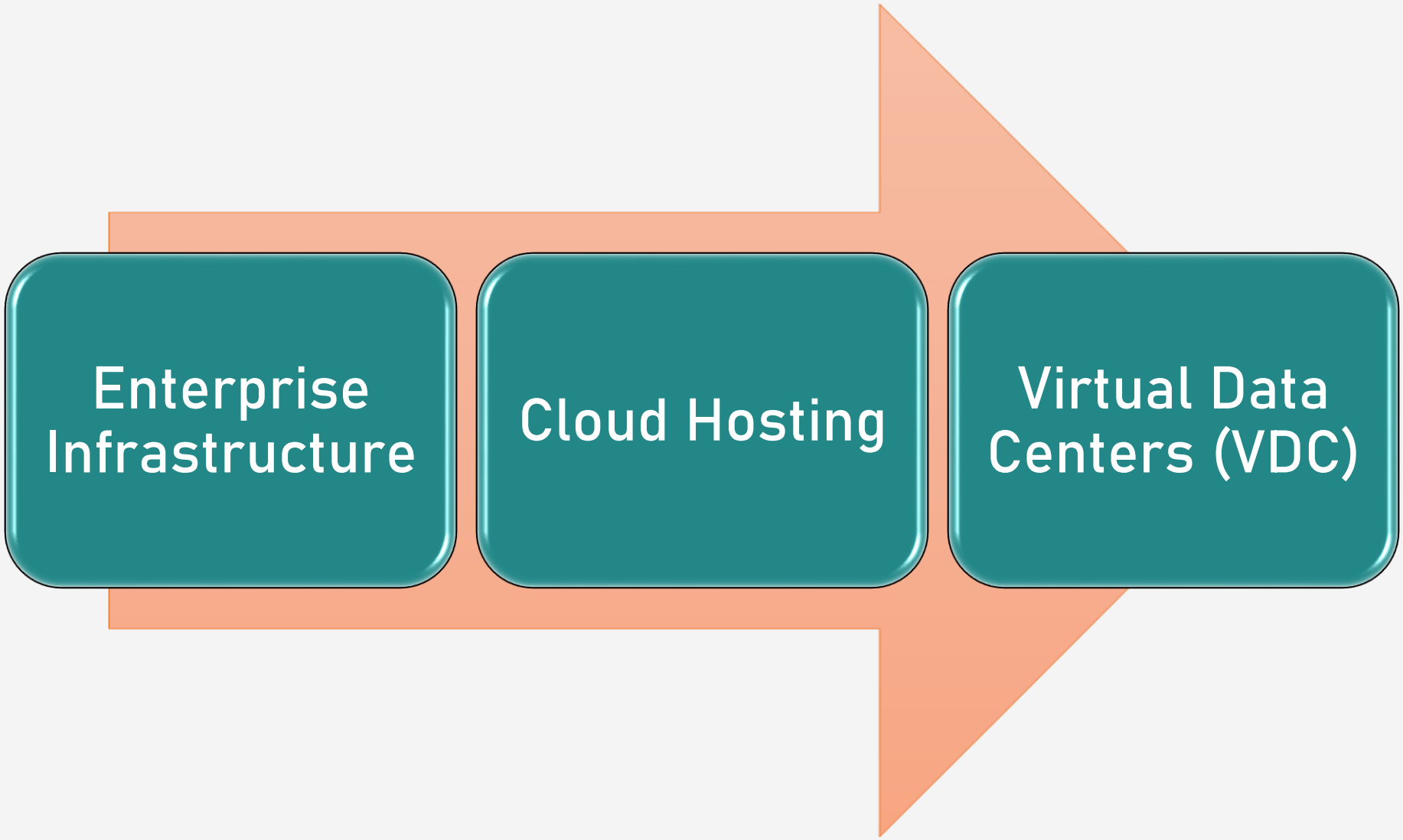
Salient Features of IaaS

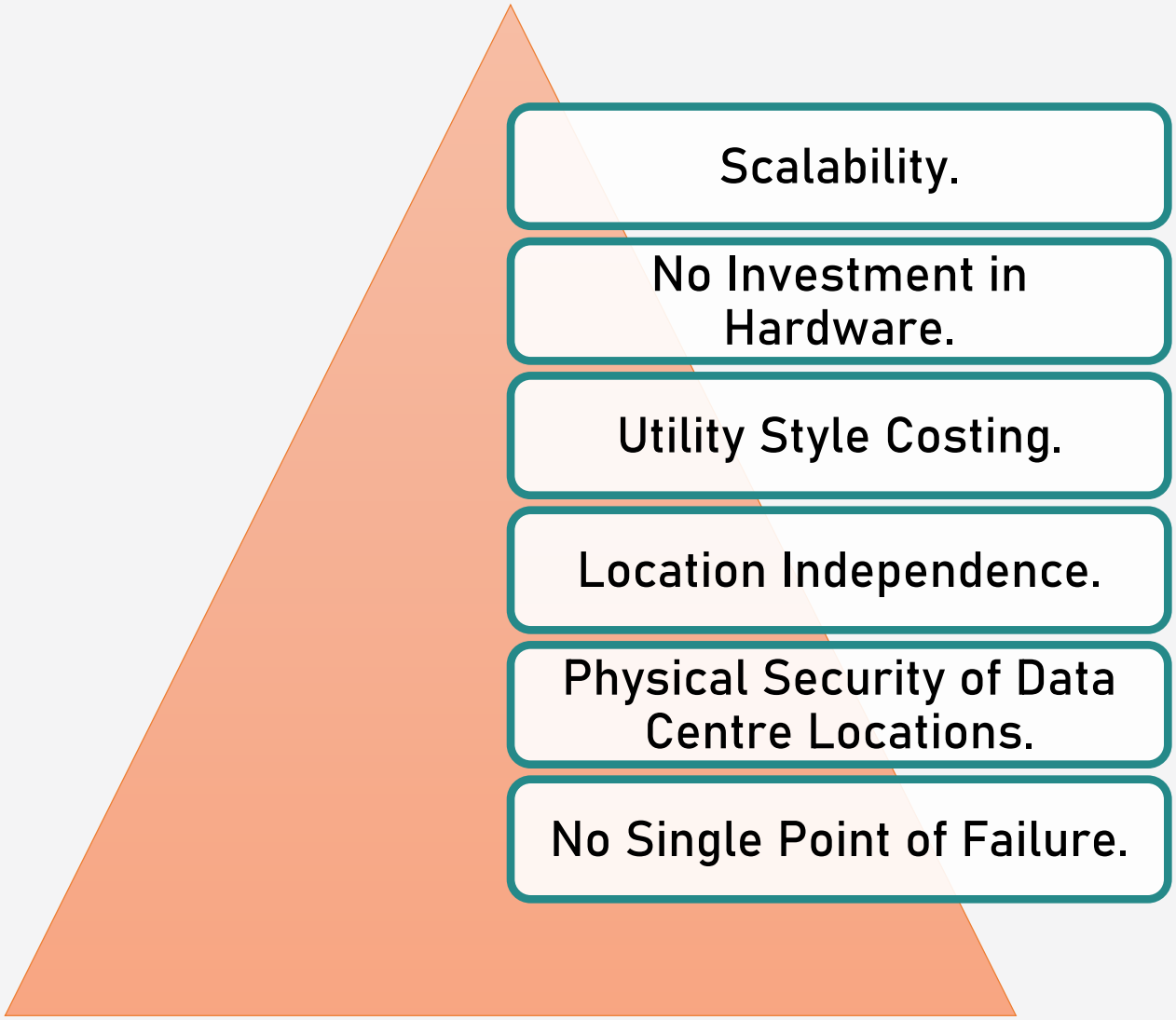


IaaS Categories

IaaS can be obtained as:

- Public or
- Private infrastructure or
- Combination of both

Advantages of IaaS



IaaS- Appropriate Uses

IaaS is useful in the following situations:

- Where Demand is Very Volatile- any time there are significant spikes and troughs in terms of demand on the infrastructure amazon.in, snapdeal, flipkart- during festival season.
- For new enterprise without capital to invest in hardware. Example- entrepreneurs starting on a shoestring budget.

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Examples of IaaS

- Amazon Web Services
- Microsoft Azure
- IBM Infrastructure
- Google Cloud Infrastructure

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Infrastructure-as-a-Service (IaaS)

- Popular IaaS offerings like Rackspace Open Cloud, Amazon EC2, IBM SoftLayer, and Google's Compute Engine (GCE) are silently powering a huge portion of the backbone of the internet, whether users realize it or not.
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Platform-as-a-Service (PaaS)

- PaaS is a category of cloud computing service that provides a platform and environment to allow developers to build applications and services over the internet.
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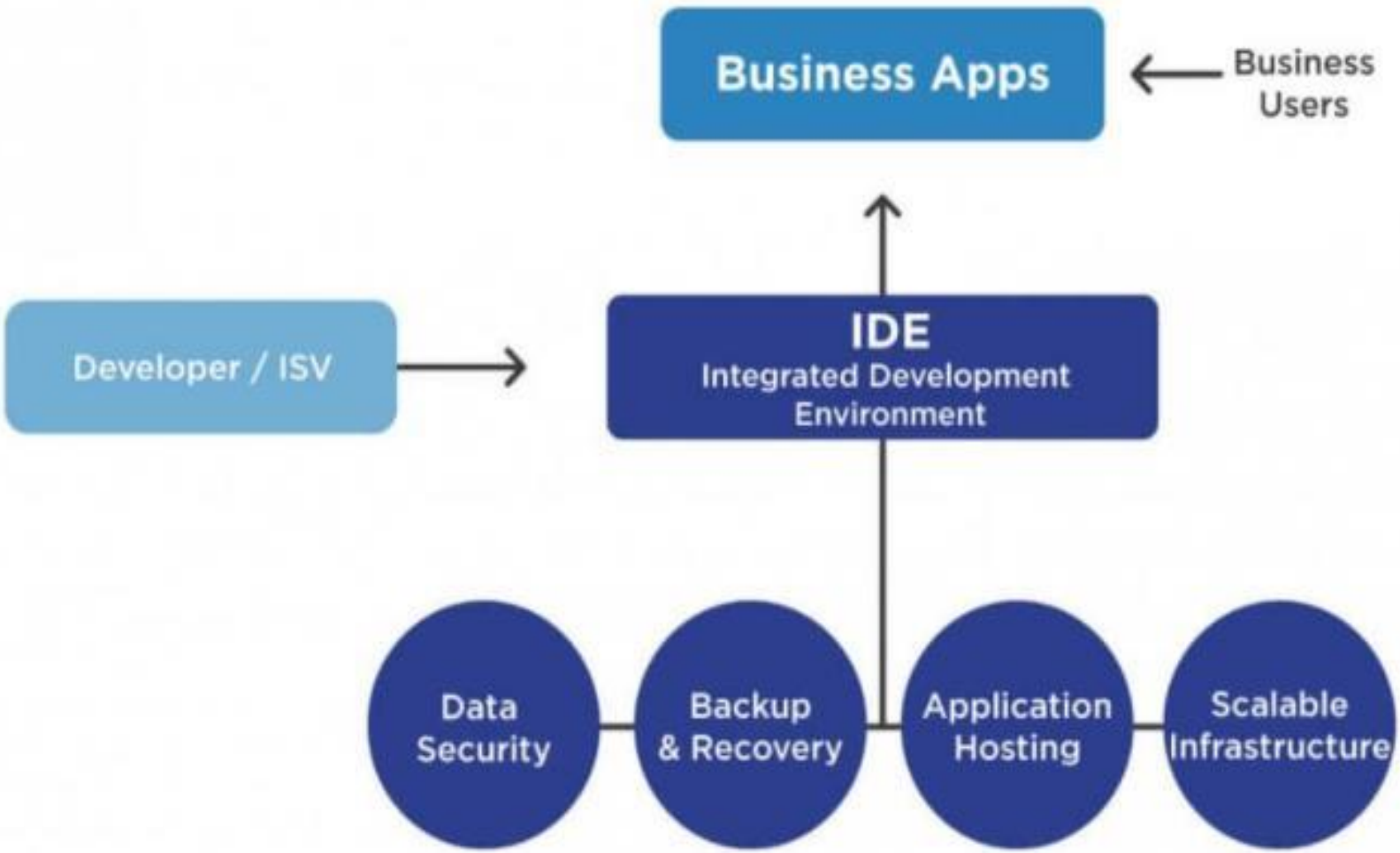

Platform-as-a-Service (PaaS)

- PaaS is expected to grow by more than 3,000% by 2026.
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Platform-as-a-Service (PaaS)

Prime examples include Amazon AWS, Salesforce Platform, Azure from Microsoft and Google App Engine. For those looking for Open Source PaaS platforms, OpenShift Origin, OpenPaaS and Cloud Foundry are probably your best options.

PaaS Goals

Create an abstracted environment that supports an efficient, cost-effective, and repeatable process for the creation and deployment of high-quality applications.

PaaS Goals

Focus on Development, not Ops

1. Programmers' development environment
    - Presentation layer: HTML, CSS, JavaScript
    - Control layer: Web Server code
    - Data layer: Data Model
    - Optionally, analytics

PaaS Goals

2. Ops below

- Made visible through a web interface
    - Operating system
    - File system
    - User authentication
    - Utilities (cron, etc.)
    - Logs
    - Database maintenance, backups, etc.

Platform-as-a-Service (PaaS) Offerings

- PaaS providers can assist developers from the conception of their original ideas to the creation of applications, and through to testing and deployment. This is all achieved in a managed mechanism.
- As with most cloud offerings, PaaS services are generally paid for on a subscription basis, with clients ultimately paying just for what they use.

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Platform-as-a-Service (PaaS) Offerings

- Operating System
- Server-side Scripting Environment
- Coding Environment
- Database Management System
- Server Software
- Support
- Storage
- Network Access
- Tools for Design and Development
- Hosting

How PaaS Works

- PaaS allows users to create software applications using tools supplied by the provider.
- PaaS services can consist of preconfigured features that customers can subscribe to; they can choose to include the features that meet their requirements while discarding those that do not.

How PaaS Works

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Advantages of PaaS

- Users don't Need to Invest in Physical Infrastructure
- Makes development possible for 'non-experts'
- Flexibility
- Adaptability
- Teams in various locations can work together
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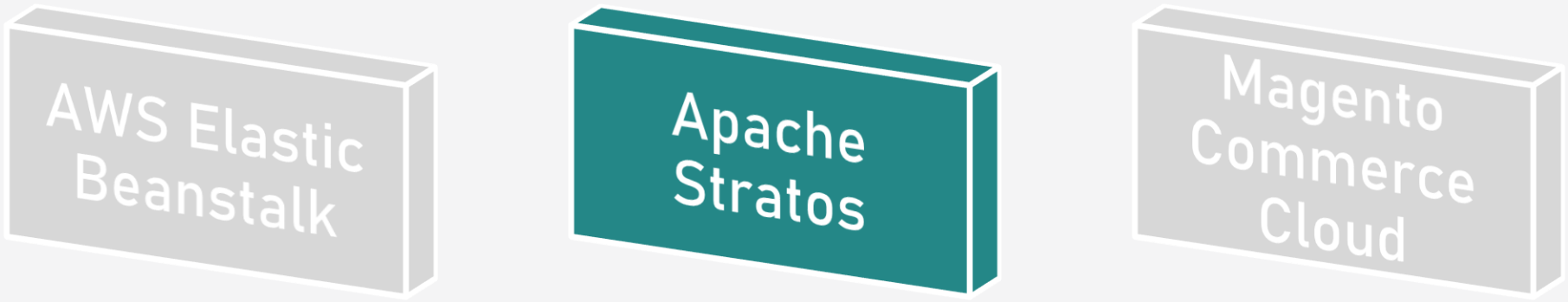

Examples of PaaS

Software-as-a-Service (SaaS)

- Describes any cloud service where consumers are able to access software applications over the internet.
- Applications are hosted in “the cloud” and can be used for a wide range of tasks for both individuals and organizations.

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Software-as-a-Service (SaaS)

Enterprise users are able to use applications for a range of needs, including accounting and invoicing, tracking sales, planning, performance monitoring and communications (including webmail and instant messaging).

Software-as-a-Service (SaaS)

Advantages of SaaS

- No Additional Hardware Costs
- No Initial Setup Costs
- Pay for What You Use
- Usage is Scalable
- Updates are Automated
- Cross-Device Compatibility
- Accessible from Any Location
- Applications can be Customized and White labelled

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Google's G Suite

Microsoft Office 365

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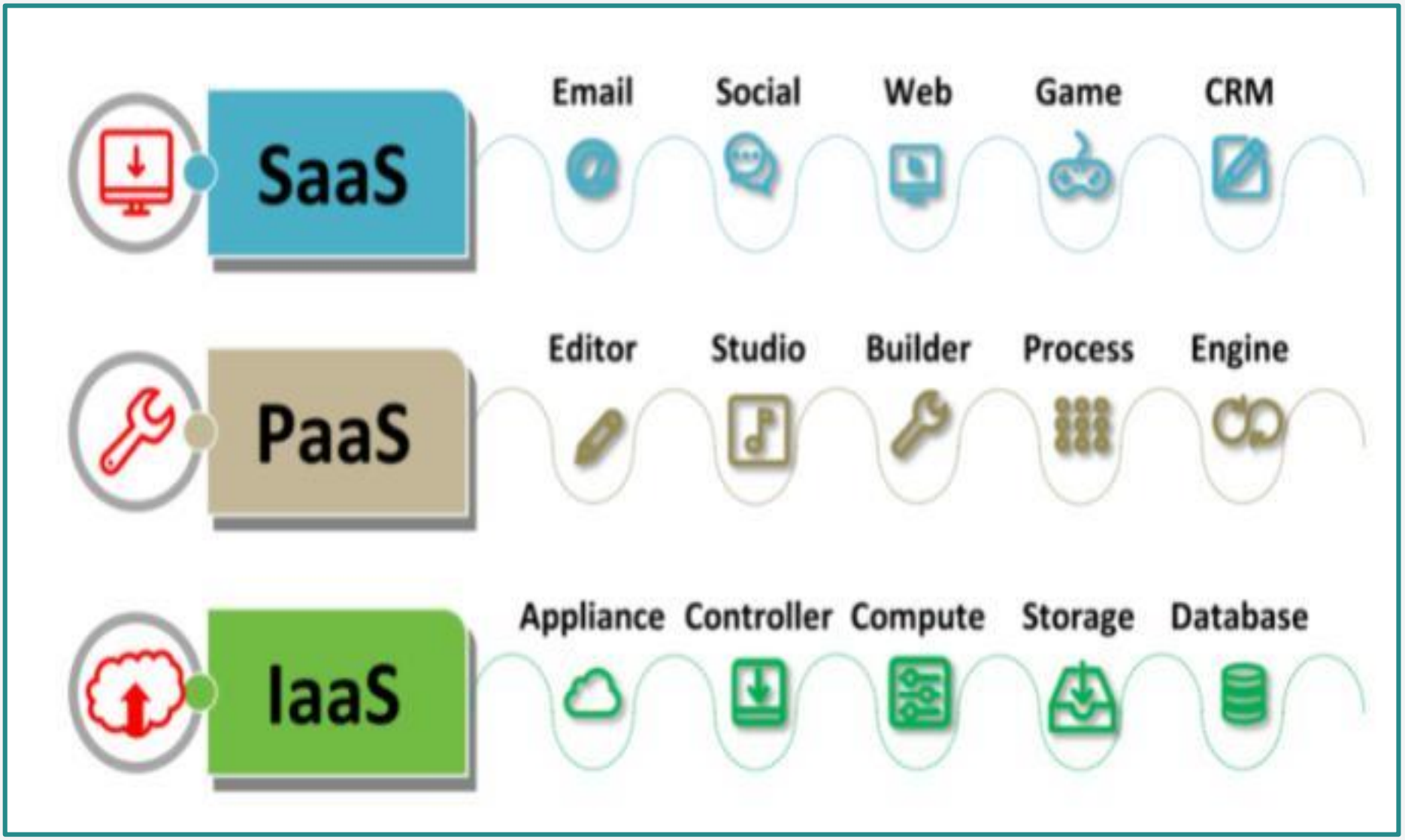
Summarization of Three Cloud Service Models



Difference Between IaaS, PaaS, and SaaS

IaaS	PaaS	SaaS
Provides a virtual data center to store information and create platforms for app development, testing, & deployment.	It provides virtual platforms and tools to create, test, and deploy apps.	Provides web software and apps to complete business tasks.
Provides access to resources such as virtual machines, virtual storage etc.	Provides runtime environments & deployment tools for applications.	Provides software as a service to the end-users.
Used by the network architects.	Used by developers.	Used by the end users.
Provides only Infrastructure.	Provides Infrastructure + Platform.	Provides Infrastructure + Platform +Software.

That's all for now...