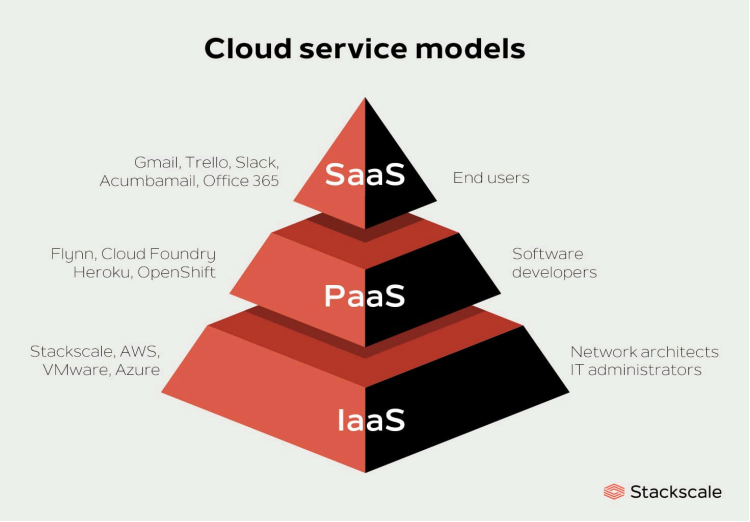
CLOUD COMPUTING

Cloud computing offers a range of services that allow businesses and individuals to use computing resources over the internet. These services are typically categorized into three primary models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Each model provides a different level of control, flexibility, and management, catering to diverse computing needs.



1. Infrastructure as a Service (IaaS)

Description:
IaaS provides virtualized computing resources—servers, storage, networking, and virtualization—delivered over the internet. Users manage their own OS, middleware, runtime, data, and applications, while the provider handles the underlying infrastructure

Diagram Placeholder:
Insert the “Infrastructure” layer (e.g., virtualization, servers, storage) at the bottom of the cloud pyramid.

Key Features & Benefits:

- **Scalability & Flexibility:** Instant resource provisioning; pay-as-you-go model .
- **Cost Savings:** No capital investment in hardware, offloading admin and maintenance tasks

- **High Control:** Full control over applications and data environments.

Common Use Cases:

- Hosting websites, databases, enterprise apps.
- Development/testing, big data processing, disaster recovery.

Limitations & Considerations:

- Responsibility for OS/security/configuration.
- Potential for vendor lock-in and management complexity.

2. Platform as a Service (PaaS)

Description:
PaaS offers a development and deployment platform—runtime, middleware, OS, and infrastructure—so developers can focus on writing code without managing the backend

Diagram Placeholder:
Middle layer in the cloud pyramid labeled “Runtime / Middleware / OS,” linking infrastructure to applications.

Key Features & Benefits:

- **Developer Productivity:** Built-in tools, frameworks, database services speed up development
- **App Lifecycle Management:** Simplified deployment, scaling, monitoring.
- **Collaboration:** Ideal for distributed teams.

Ideal Use Cases:

- Web/mobile app development, API-driven services.
- Analytics platforms, business intelligence.

Limitations & Trade-offs:

- Less control over underlying layers.
- Risk of vendor lock-in and compatibility constraints.

3. Software as a Service (SaaS)

Description:
SaaS delivers fully functional applications via the internet. The provider manages everything—from infrastructure to the app—while users access it via browsers or thin clients

Diagram Placeholder:
Top cloud pyramid layer labeled “Applications / Data,” accessible by end users.

Key Features & Benefits:

- **Ready-to-Use:** No installation or maintenance needed.
- **Seamless Updates:** Providers handle all upgrades and security patches.
- **Accessibility:** Anywhere, anytime access using any device.

Common Use Cases:

- Office suites (e.g., Google Workspace, Microsoft 365), CRM systems, collaboration tools.

Limitations & Trade-offs:

- Customization limited to available configurations.
- Dependent on provider's uptime and data policies.