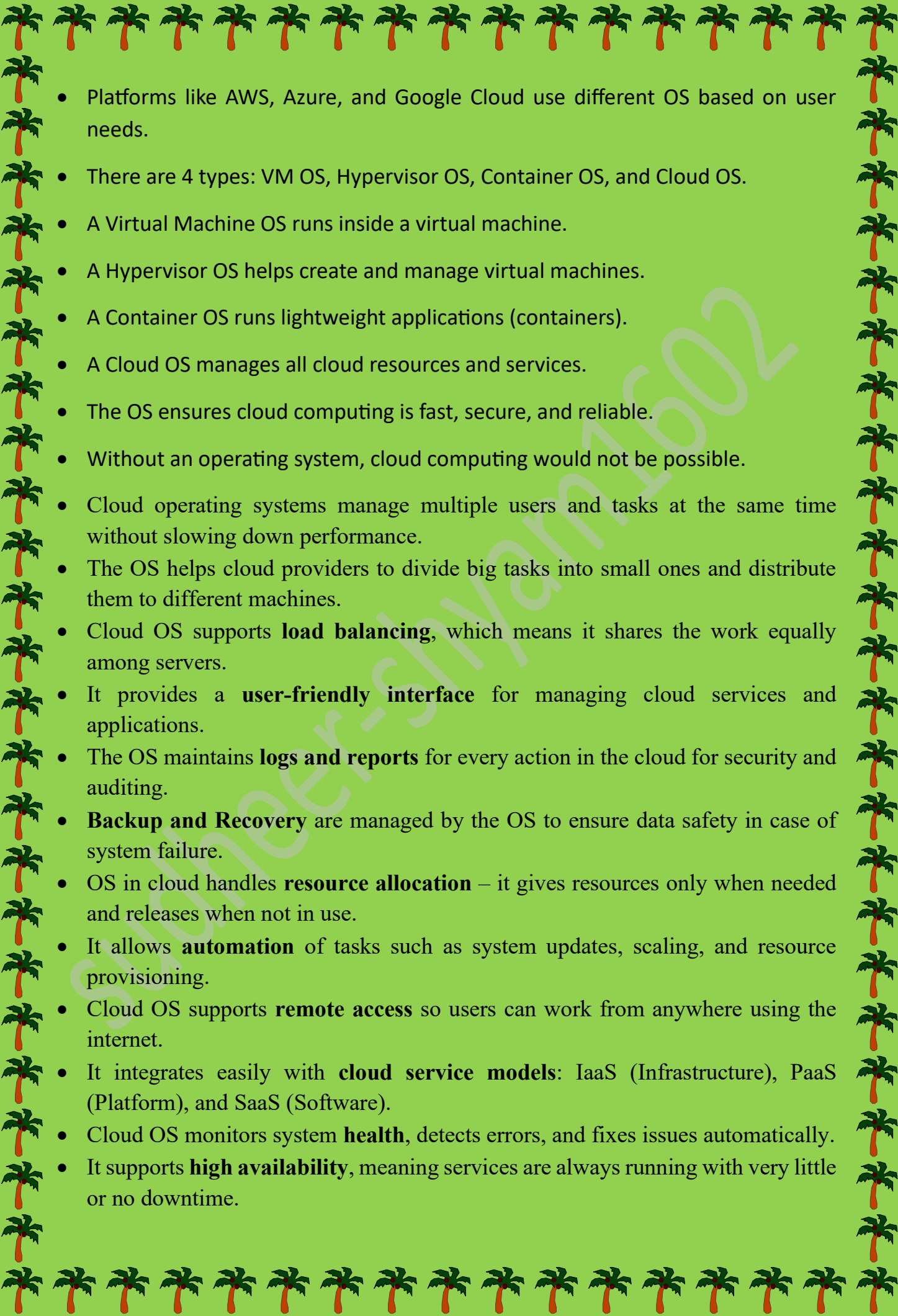


## • Operating System in Cloud Computing

- An Operating System (OS) is system software that manages all hardware and software in a computer.
- It acts like a manager between the user and the computer system.
- In cloud computing, the OS plays a big role in managing virtual machines and resources.
- Cloud computing means delivering services like storage, software, and servers over the internet.
- A cloud OS helps manage everything in the cloud environment.
- It controls how different virtual machines (VMs) work on the same physical server.
- OS in the cloud also supports virtualization, which allows one machine to act like many.
- It helps in running many applications on different systems using the same hardware.
- The OS manages CPU, RAM, storage, and network resources efficiently.
- It ensures that all users in the cloud get proper service and don't interfere with each other.
- This is called multi-tenancy – multiple users sharing one system securely.
- It also supports scalability, meaning it can increase or decrease resources based on demand.
- Security is another key role – OS handles firewalls, encryption, and user permissions.
- The OS allows smooth communication between cloud systems using networking.
- It helps in automatic updates, system monitoring, and performance tracking.
- OS makes sure cloud services run without interruptions.
- Examples of cloud OS are Amazon Linux, Windows Server, and Ubuntu.

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- Platforms like AWS, Azure, and Google Cloud use different OS based on user needs.
  - There are 4 types: VM OS, Hypervisor OS, Container OS, and Cloud OS.
  - A Virtual Machine OS runs inside a virtual machine.
  - A Hypervisor OS helps create and manage virtual machines.
  - A Container OS runs lightweight applications (containers).
  - A Cloud OS manages all cloud resources and services.
  - The OS ensures cloud computing is fast, secure, and reliable.
  - Without an operating system, cloud computing would not be possible.
  - Cloud operating systems manage multiple users and tasks at the same time without slowing down performance.
  - The OS helps cloud providers to divide big tasks into small ones and distribute them to different machines.
  - Cloud OS supports **load balancing**, which means it shares the work equally among servers.
  - It provides a **user-friendly interface** for managing cloud services and applications.
  - The OS maintains **logs and reports** for every action in the cloud for security and auditing.
  - **Backup and Recovery** are managed by the OS to ensure data safety in case of system failure.
  - OS in cloud handles **resource allocation** – it gives resources only when needed and releases when not in use.
  - It allows **automation** of tasks such as system updates, scaling, and resource provisioning.
  - Cloud OS supports **remote access** so users can work from anywhere using the internet.
  - It integrates easily with **cloud service models**: IaaS (Infrastructure), PaaS (Platform), and SaaS (Software).
  - Cloud OS monitors system **health**, detects errors, and fixes issues automatically.
  - It supports **high availability**, meaning services are always running with very little or no downtime.

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- A decorative border of palm trees surrounds the text. The border consists of a top row of 15 palm trees, a bottom row of 15 palm trees, and two vertical columns of 15 palm trees each on the left and right sides.
- The OS makes cloud environments **cost-effective** by optimizing resource usage.
  - It allows **collaboration**, where many users can work together on the same data or software in real-time.
  - OS ensures **data isolation**, so one user's data is not mixed or accessed by another.
  - Cloud OS supports **multi-cloud** environments, where services are distributed across different cloud providers.
  - It allows running **hybrid applications**, which use both cloud and local resources together.
  - The OS handles **container orchestration tools** like Kubernetes for managing containerized applications.
  - It enables **DevOps** practices by integrating development and operations workflows smoothly.
  - It plays a central role in implementing **cloud security policies and compliance**.
  - Cloud operating systems support **API management**, allowing developers to access services easily.
  - They help in creating **virtual networks** to securely connect cloud resources.
  - OS in the cloud also helps in **data migration** from local systems to cloud.
  - It ensures **performance tuning**, where the cloud runs fast and efficiently with proper settings.
  - Finally, the cloud OS is the **backbone** of all cloud services—it keeps everything running smoothly, safely, and efficiently.