

SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution

Coimbatore-35



Department of Computer Science and Engineering

23CST206-OPERATING SYSTEMS AND VIRTUALIZATION

B.E- CSE /IV SEMESTER

UNIT - IV VIRTUALIZATION

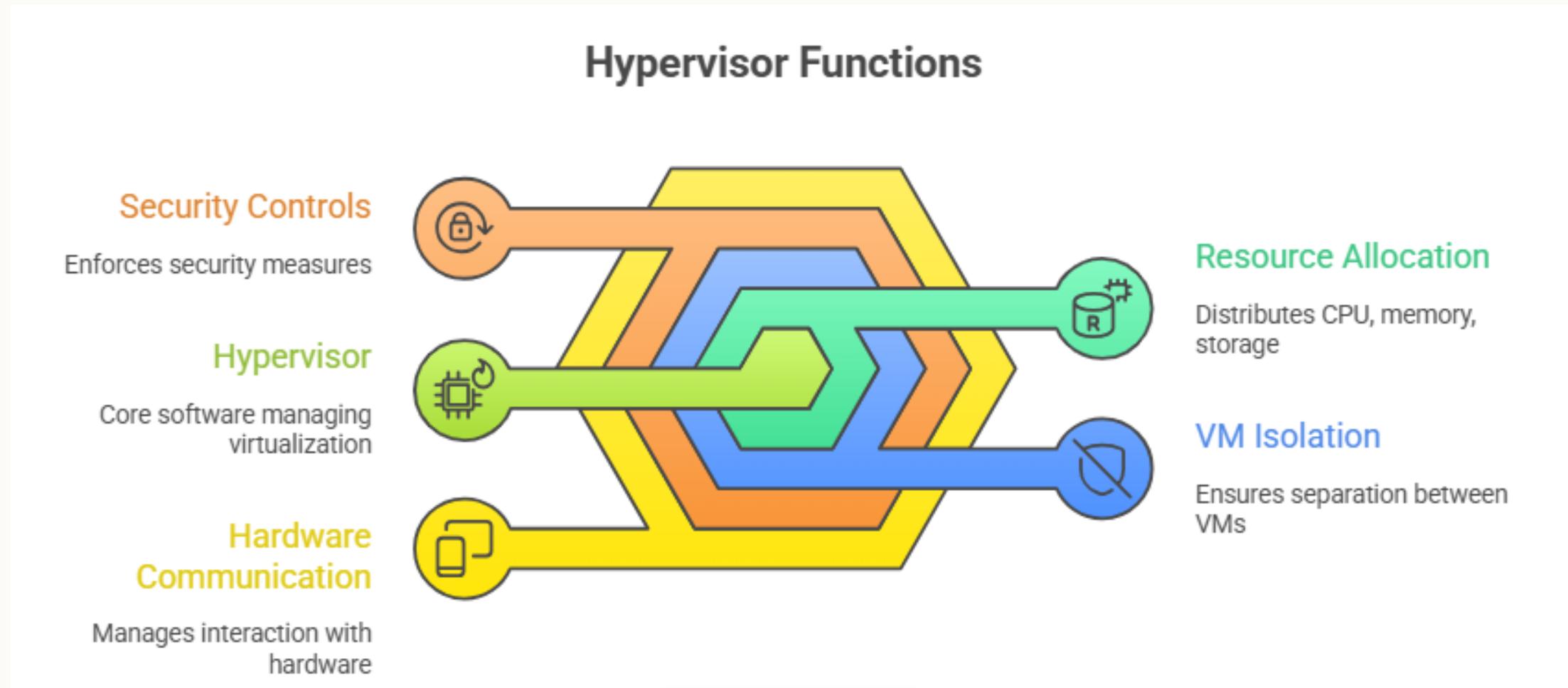
Topic 6: Components of Virtualization

Components of Virtualization Architecture

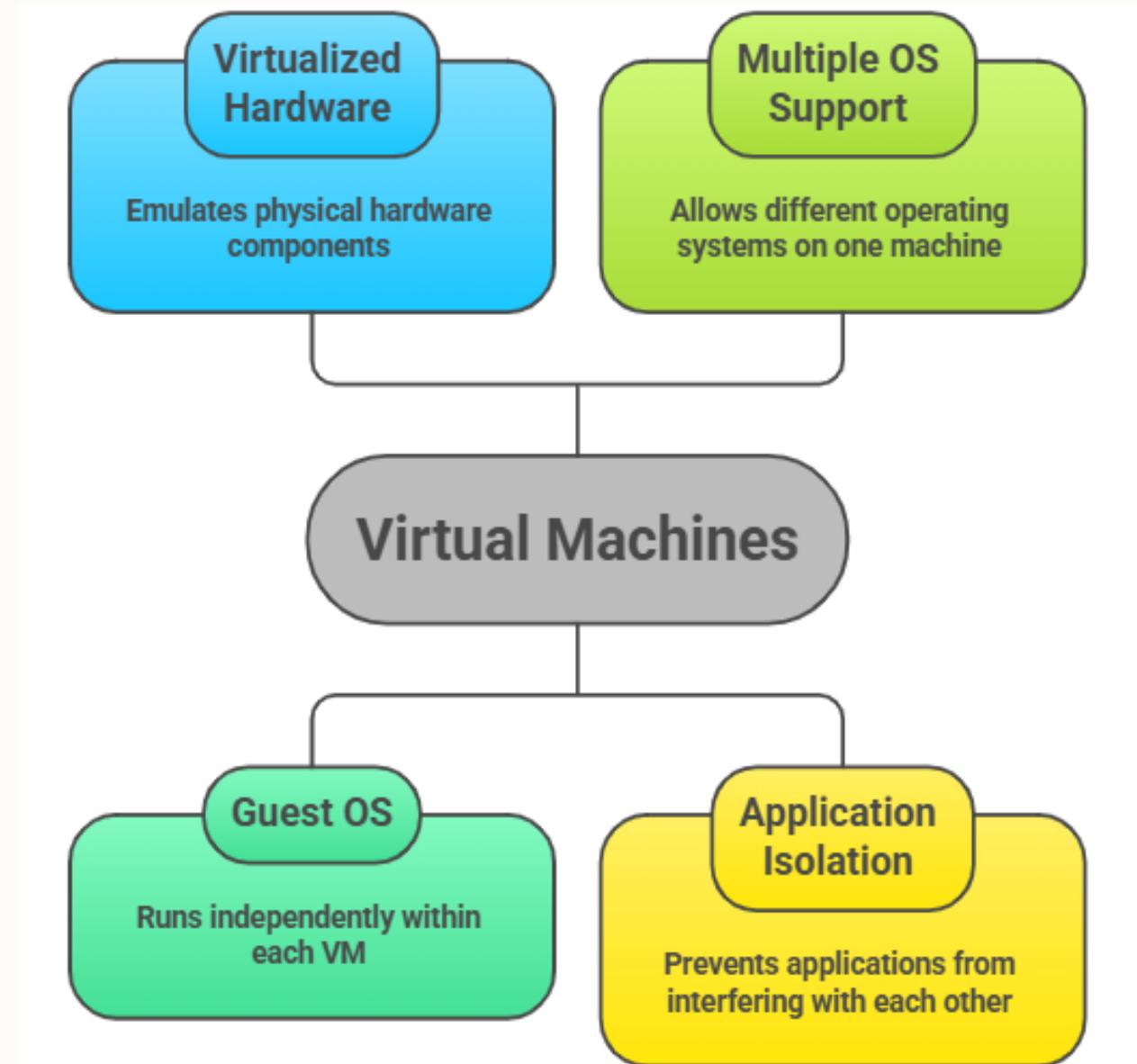
Components of Virtualization Architecture



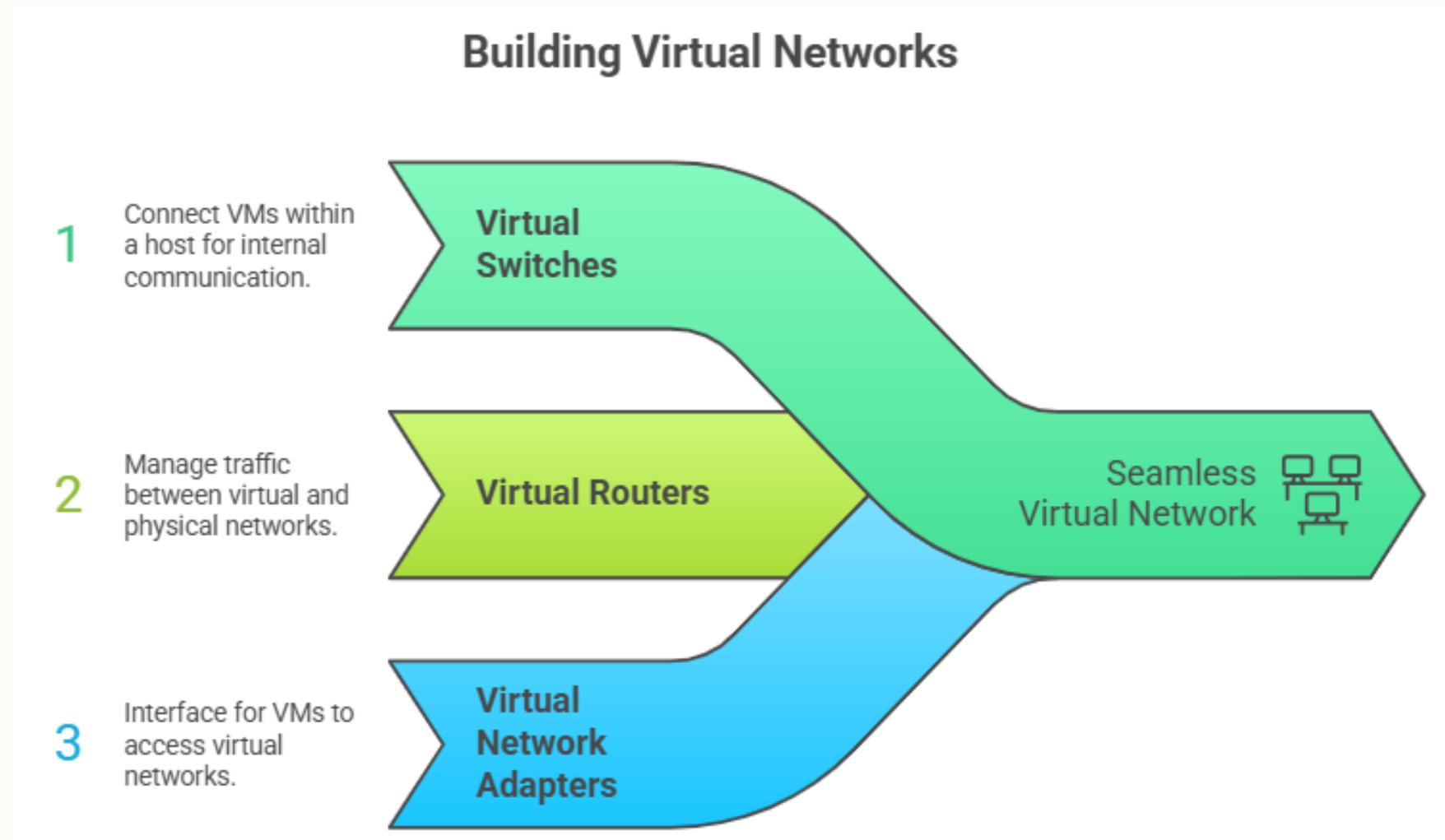
1. Hypervisor (Virtual Machine Monitor – VMM)



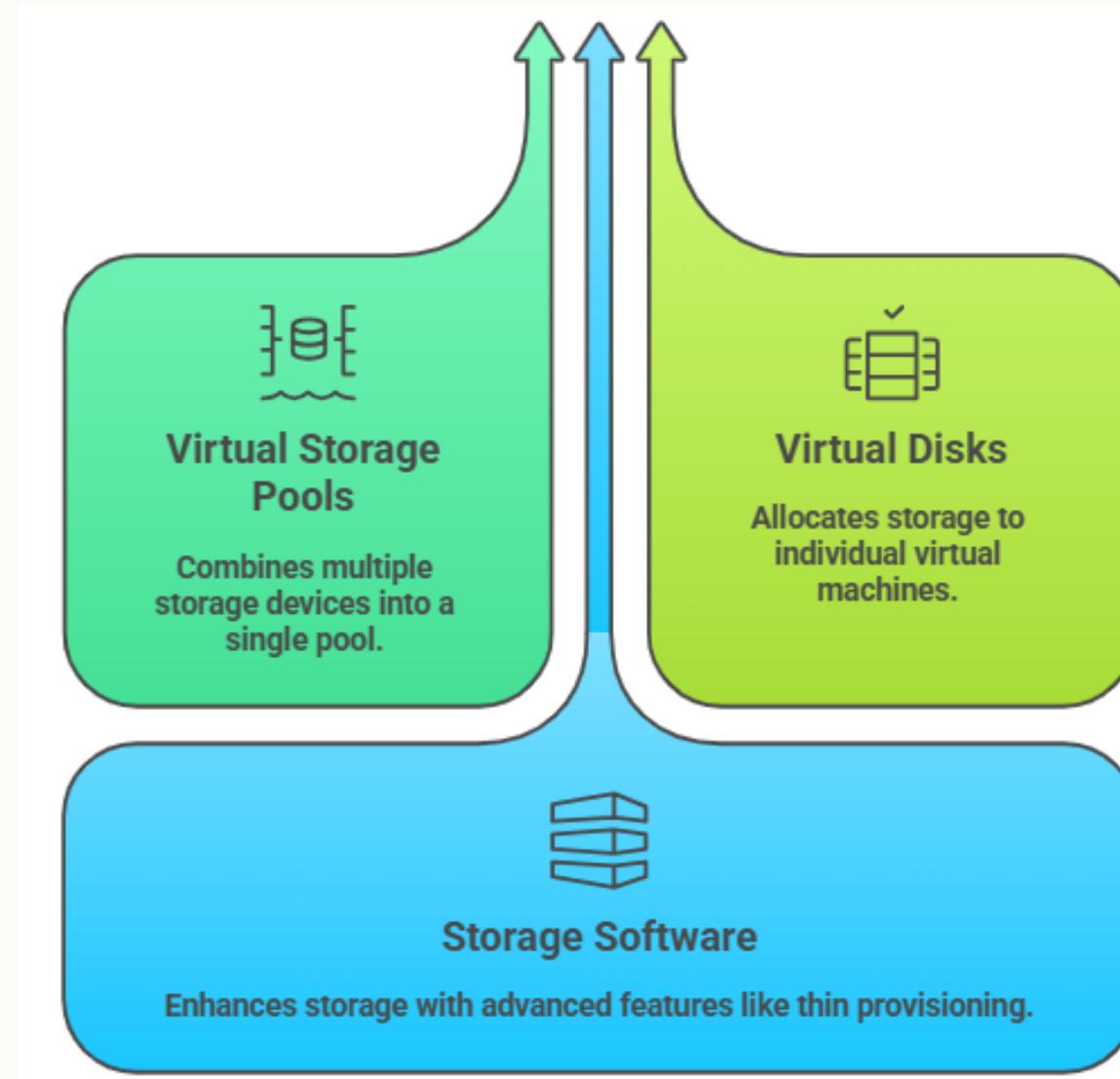
2. Virtual Machines (VMs)



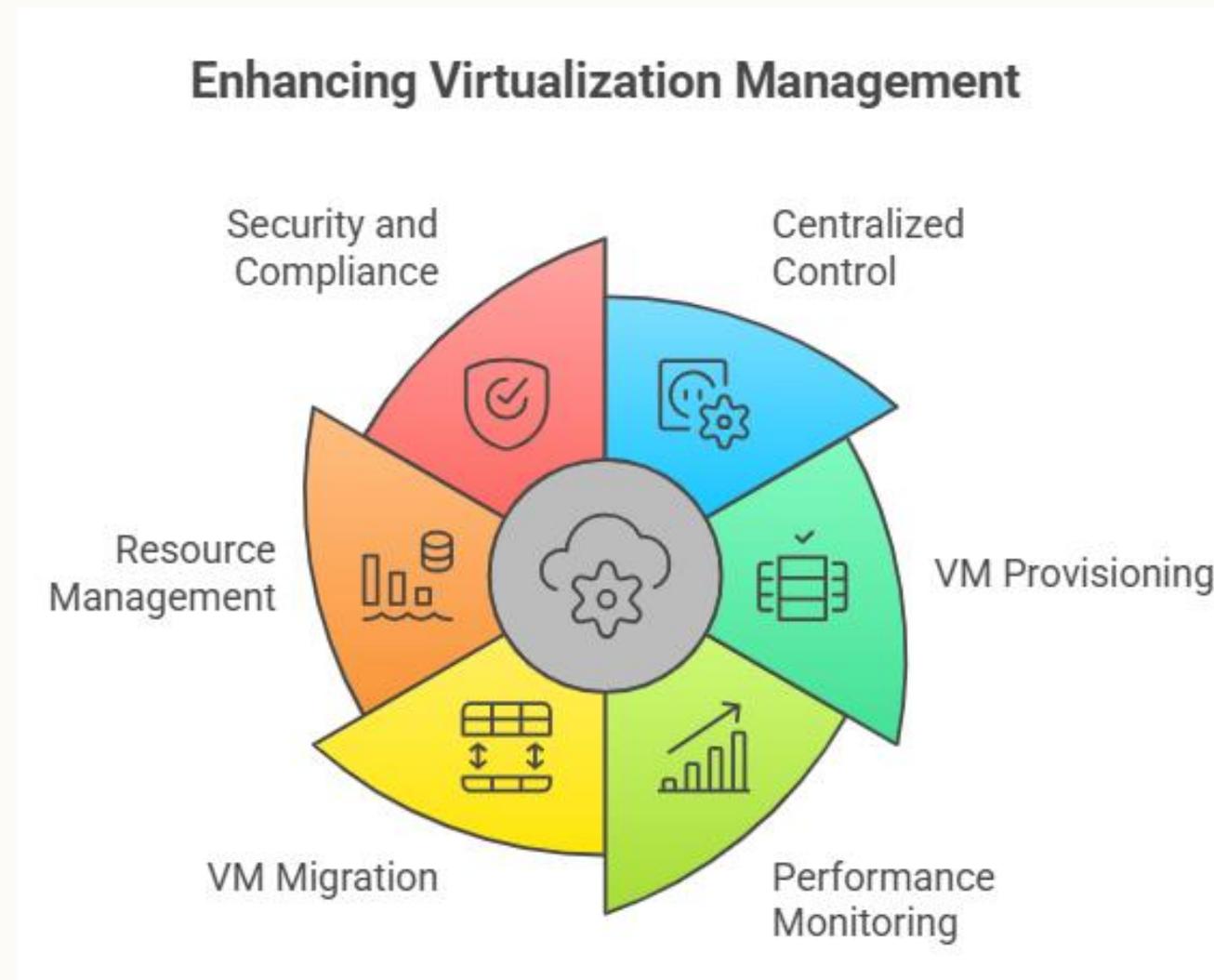
3. Virtual Networking



4. Storage Virtualization

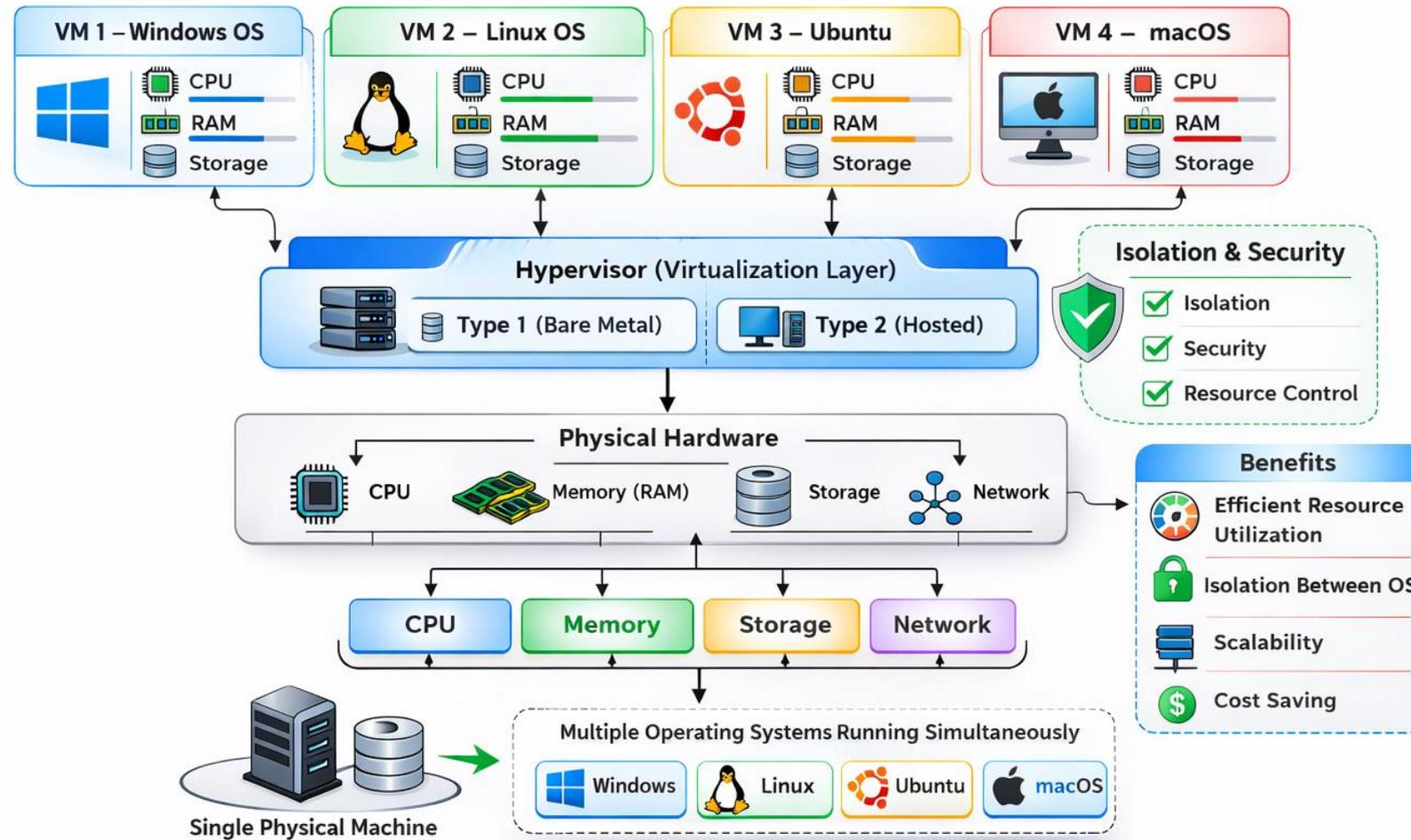


5. Virtualization Management Tools

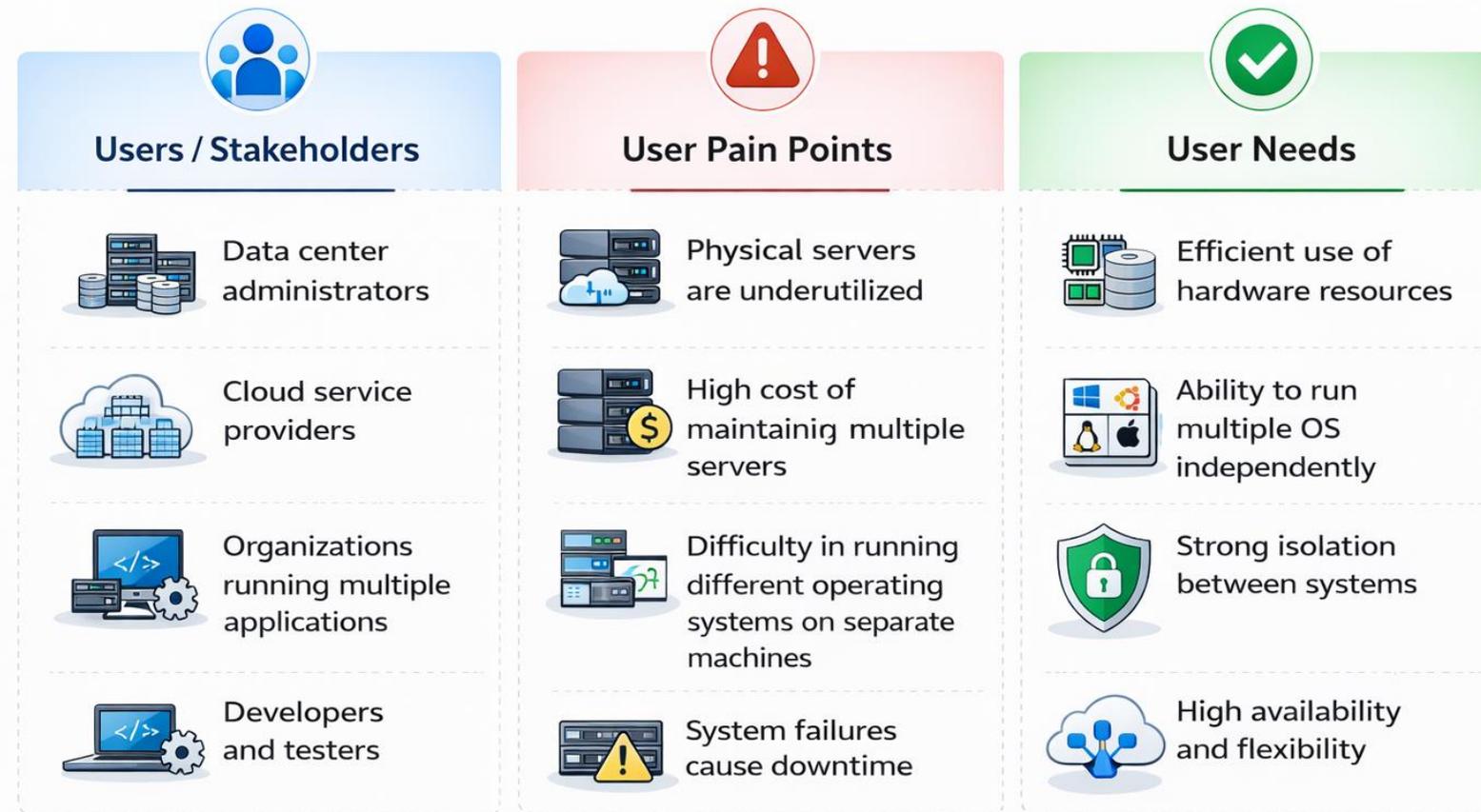


Problem Statement

Running Multiple Operating Systems on a Single Physical Machine



Empathize

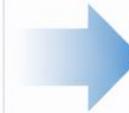


Define

Core Problem



-  Traditional physical systems allow only one OS per machine
-  Hardware resources are wasted
-  Managing and scaling systems is difficult and costly
-  Lack of flexibility for testing, deployment, and disaster recovery

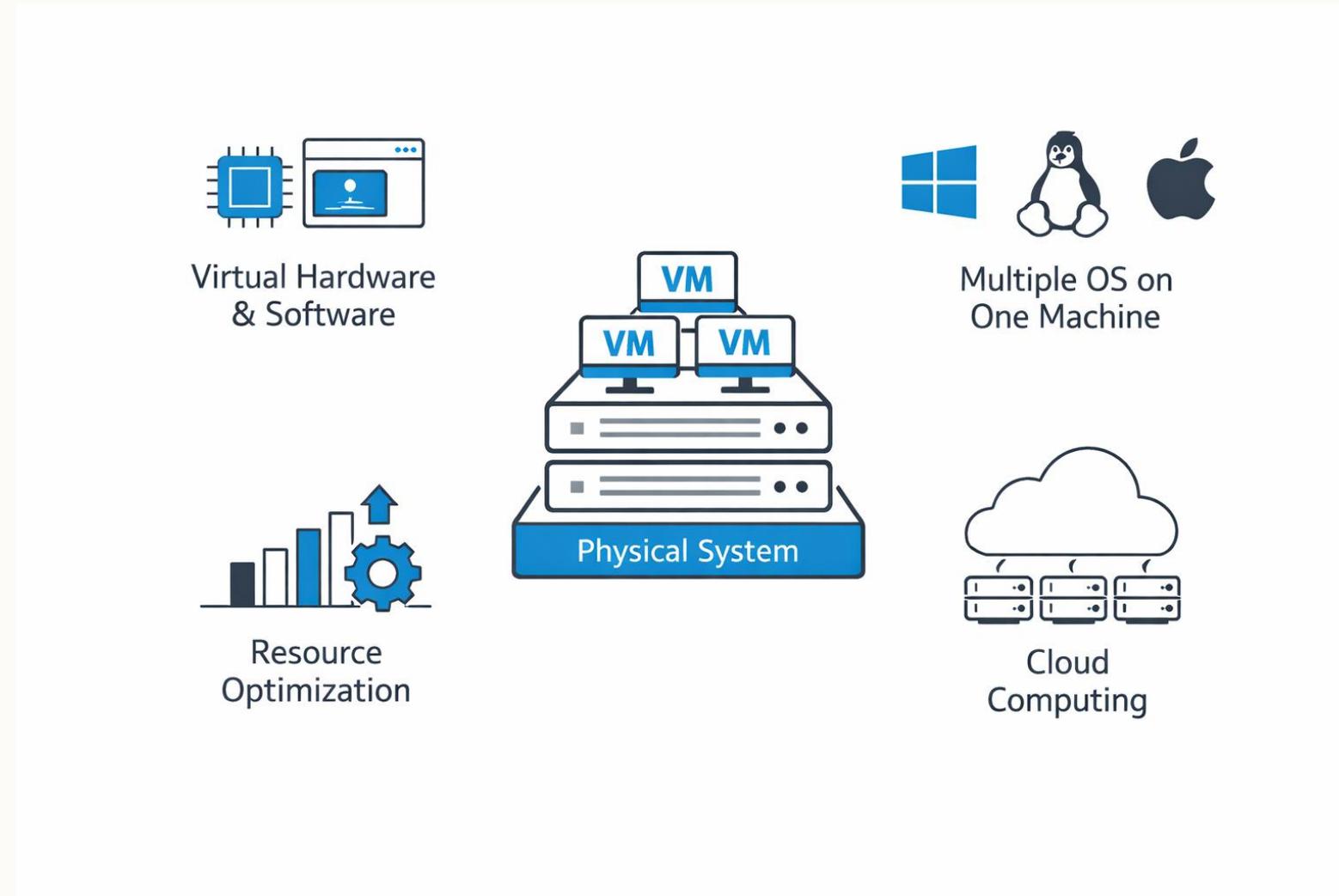


Design Goal



- **Multiple** independent operating systems running efficiently on the same hardware

Ideate



Prototype

Explored Solutions

-  Running applications directly on one OS
- 
-  Dual boot systems
-  Emulation and software-based virtualization

Limitations Identified

-  Dual boot does not allow simultaneous OS execution
-  Emulation is slow
-  Software-only virtualization has performance overhead

Best Idea

-  Introduce a **hypervisor** to virtualize hardware resources



- Hardware abstraction
- Independent virtual machines
- Concurrent execution of multiple OS

Test

System Virtualization

