

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 – V HYPERVISOR

Topic 3:Type 2

Which hypervisor type offers direct hardware access?

Type-1 Hypervisor



Direct hardware access

Runs directly on hardware



Bare-metal installation

Installed directly on the physical hardware



Higher performance

Generally offers better performance due to direct hardware access

Type-2 Hypervisor



Indirect hardware access

Uses host OS to access hardware



Hosted installation

Runs on top of an existing OS



Lower performance

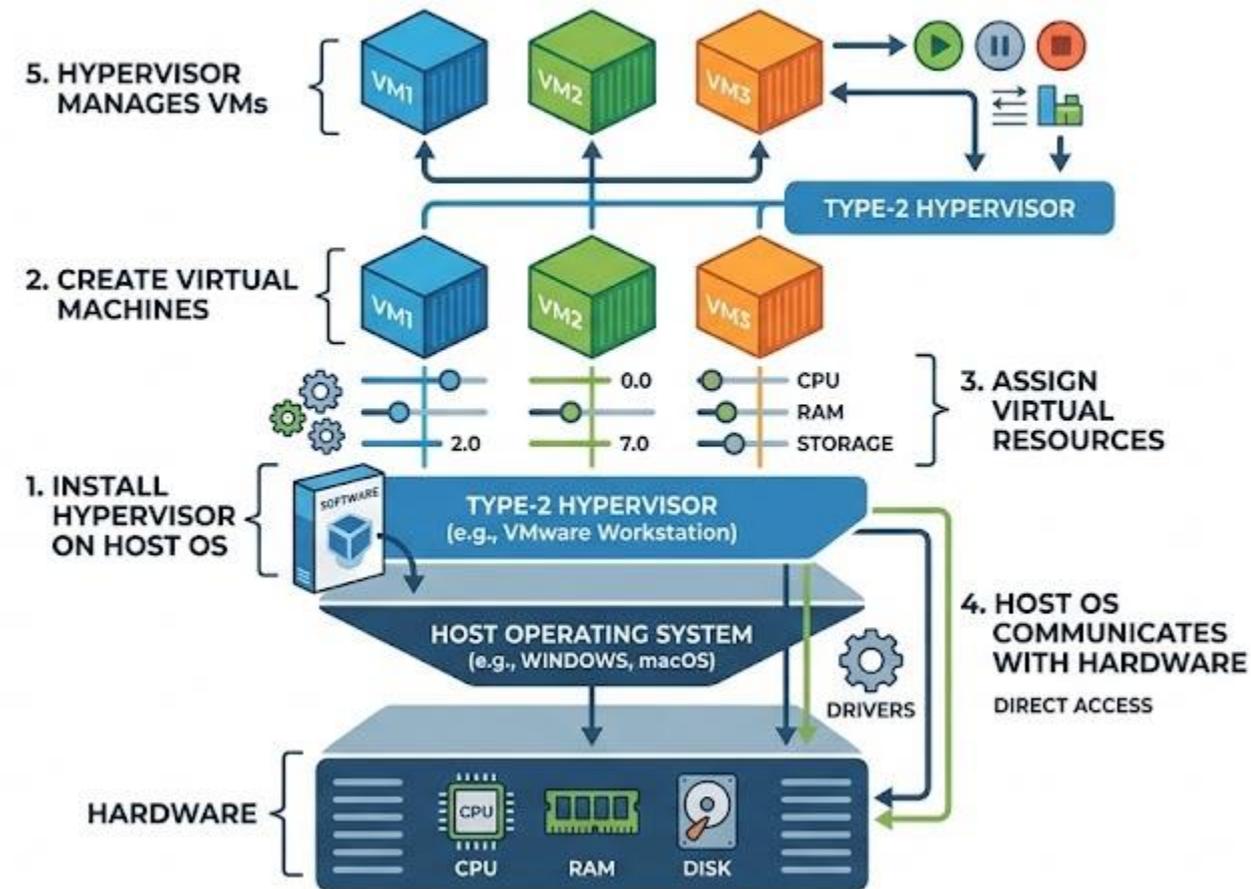
Performance can be impacted by the host OS

Architecture Overview

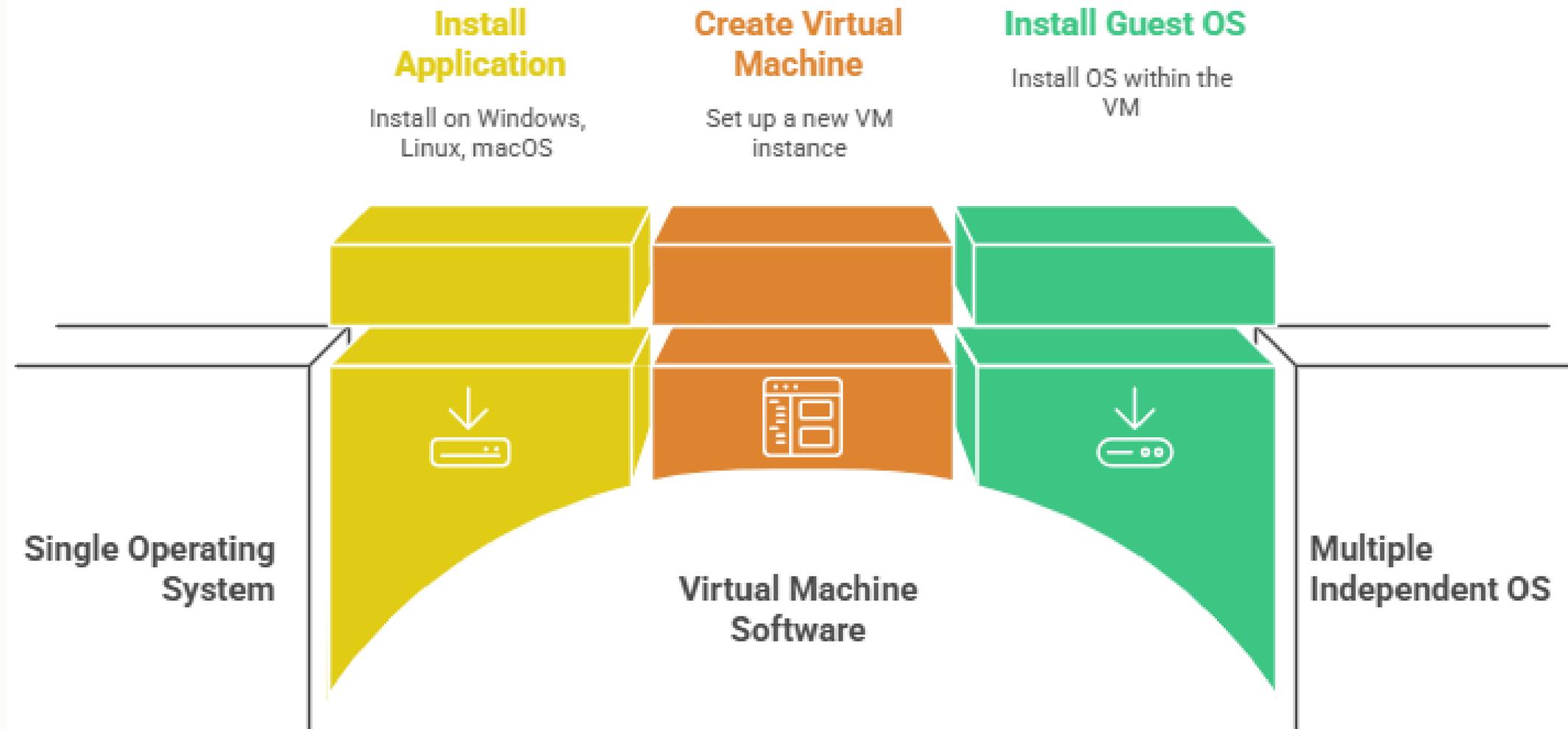
Layers in Type-2 Hypervisor



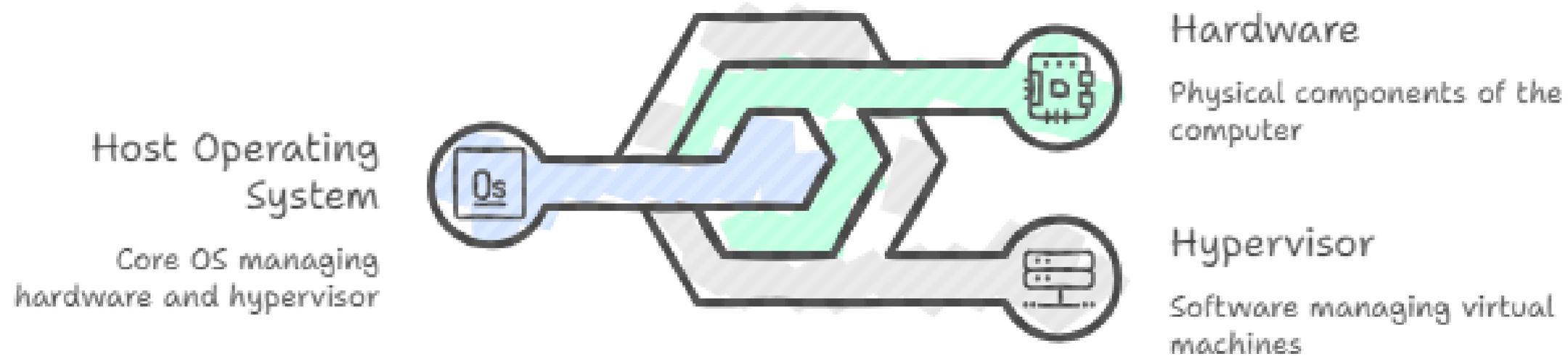
Working of Type-2 Hypervisor



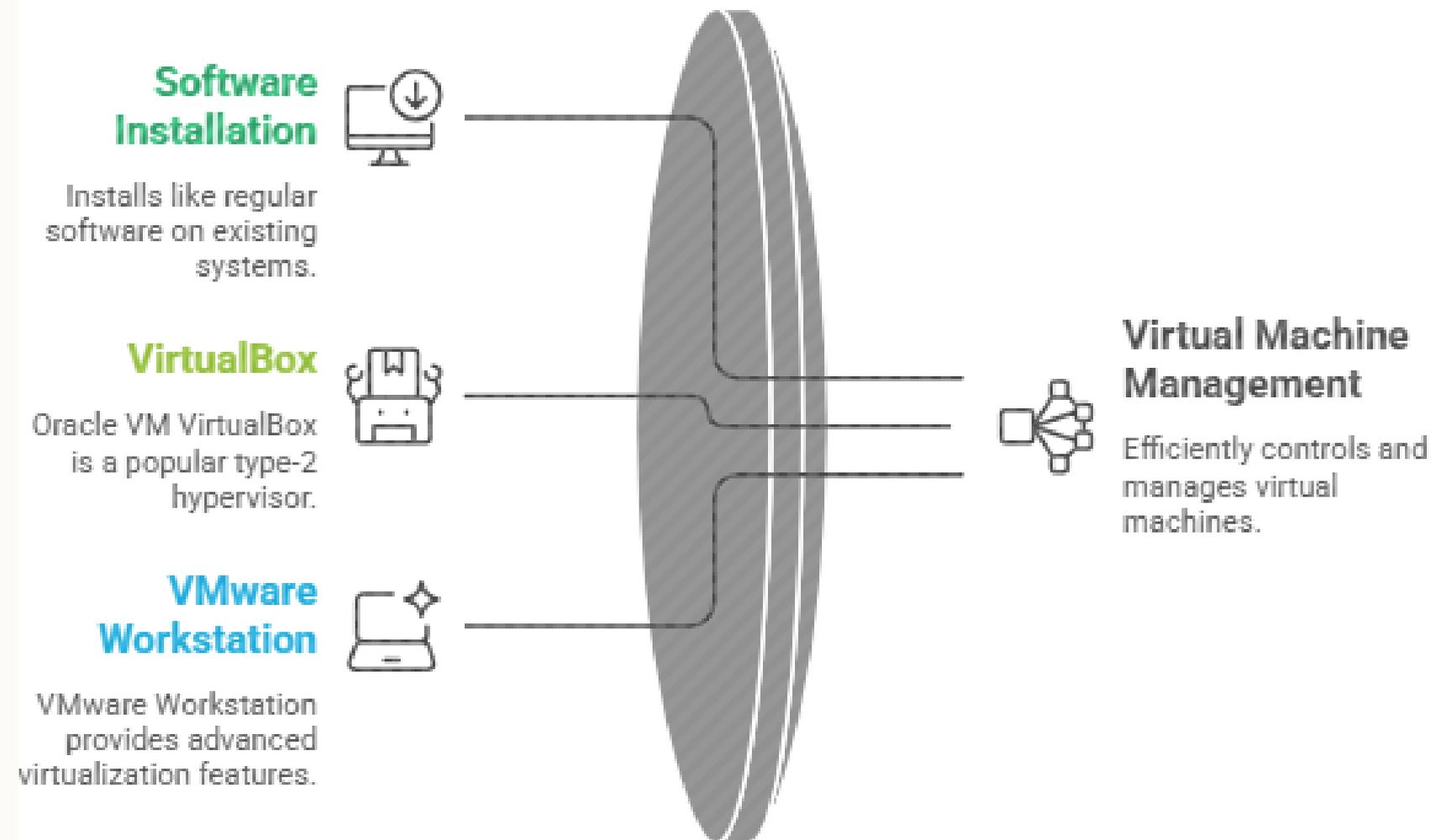
Virtual Machines: Independent OS Environments



Host Operating System Hierarchy



Type-2 Hypervisor

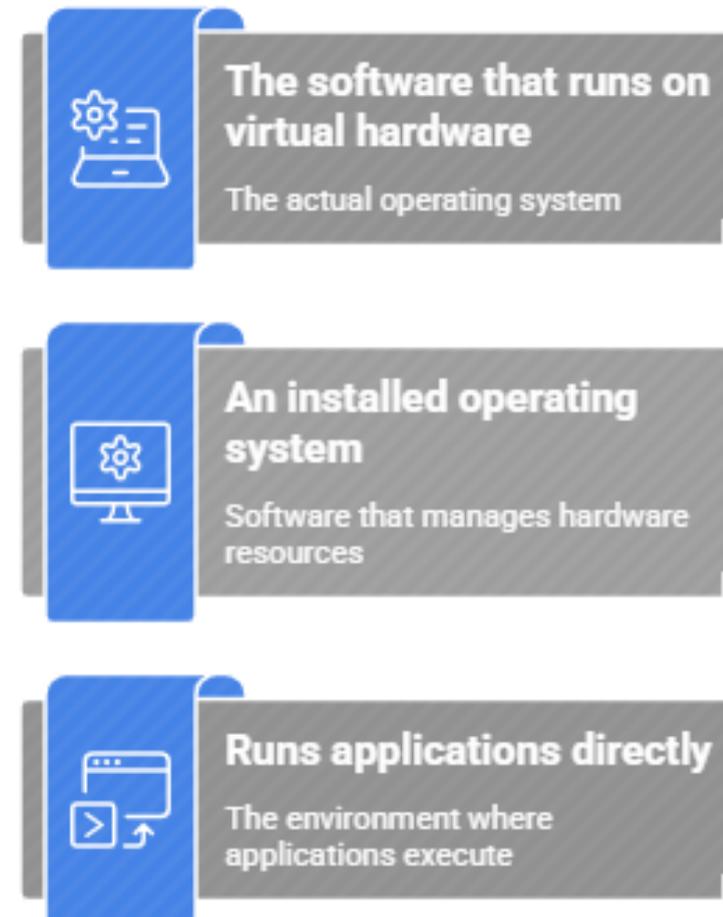


Which component provides the operating environment for applications?

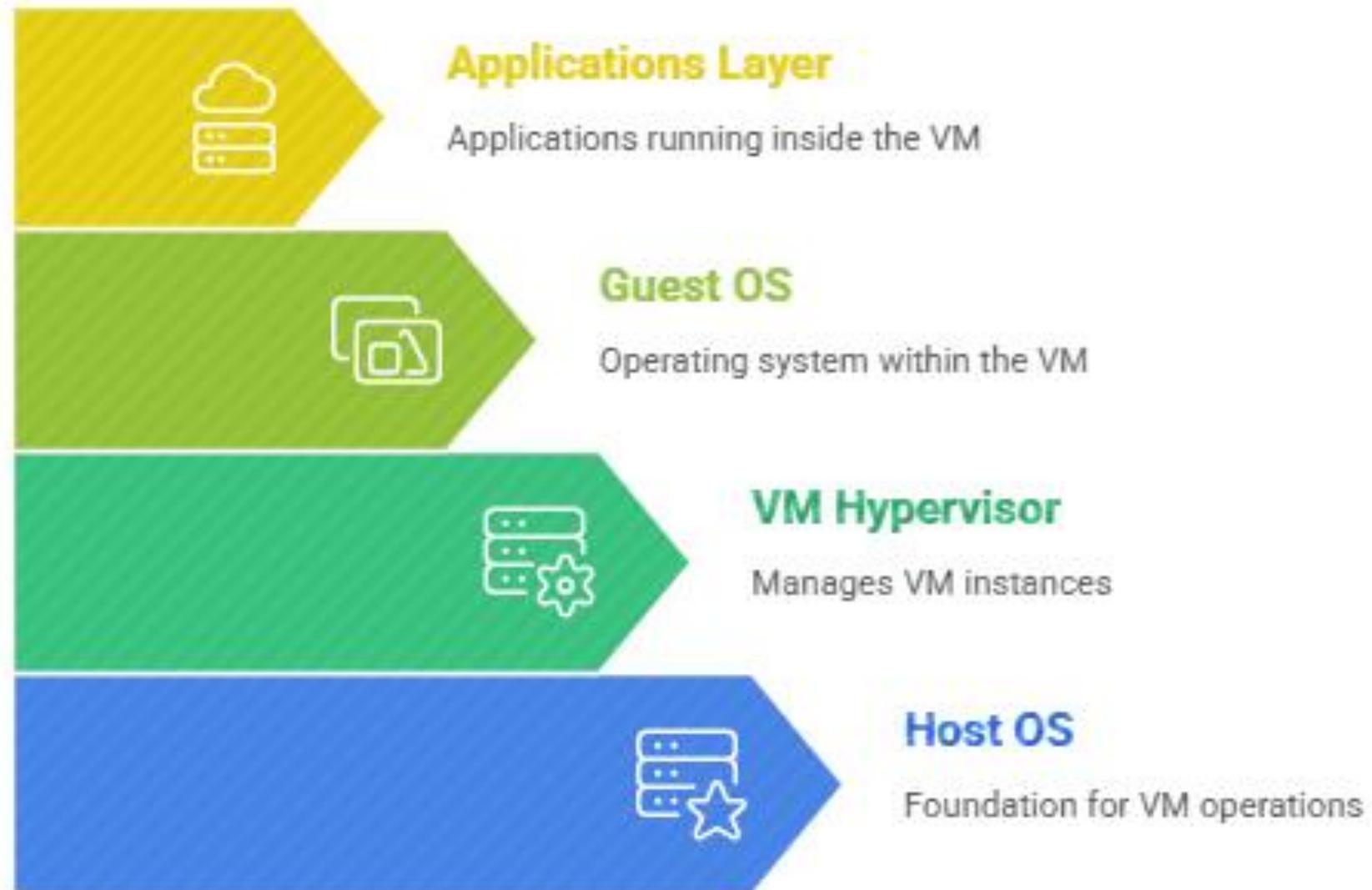
Virtual Machines



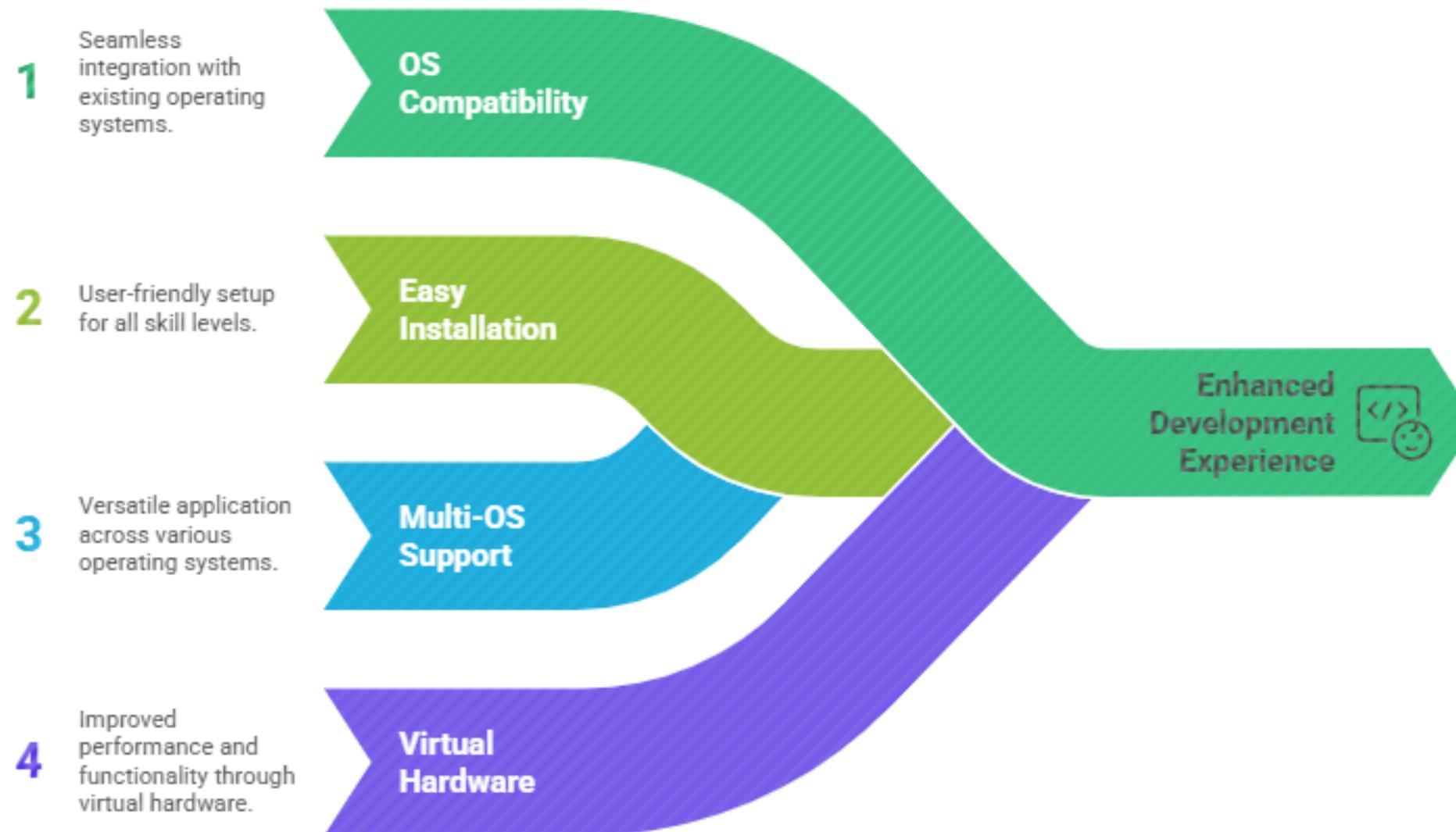
Guest OS



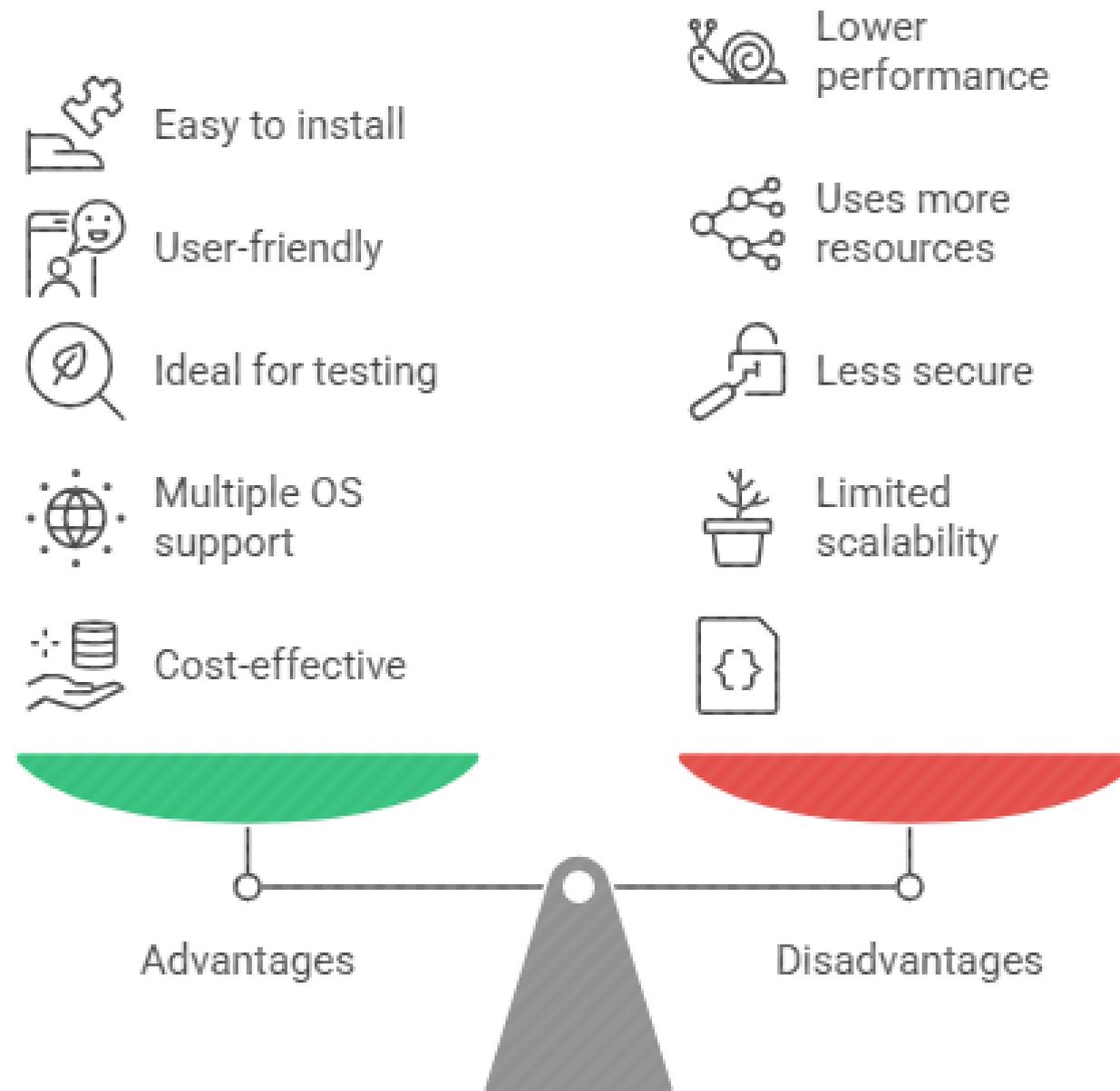
VM Architecture Hierarchy



Building a Powerful Development Environment



Balancing Advantages and Disadvantages of a Software Solution



Virtualization Software Overview

Parallels Desktop

Optimized for macOS users

VMware Fusion

Seamless experience for macOS



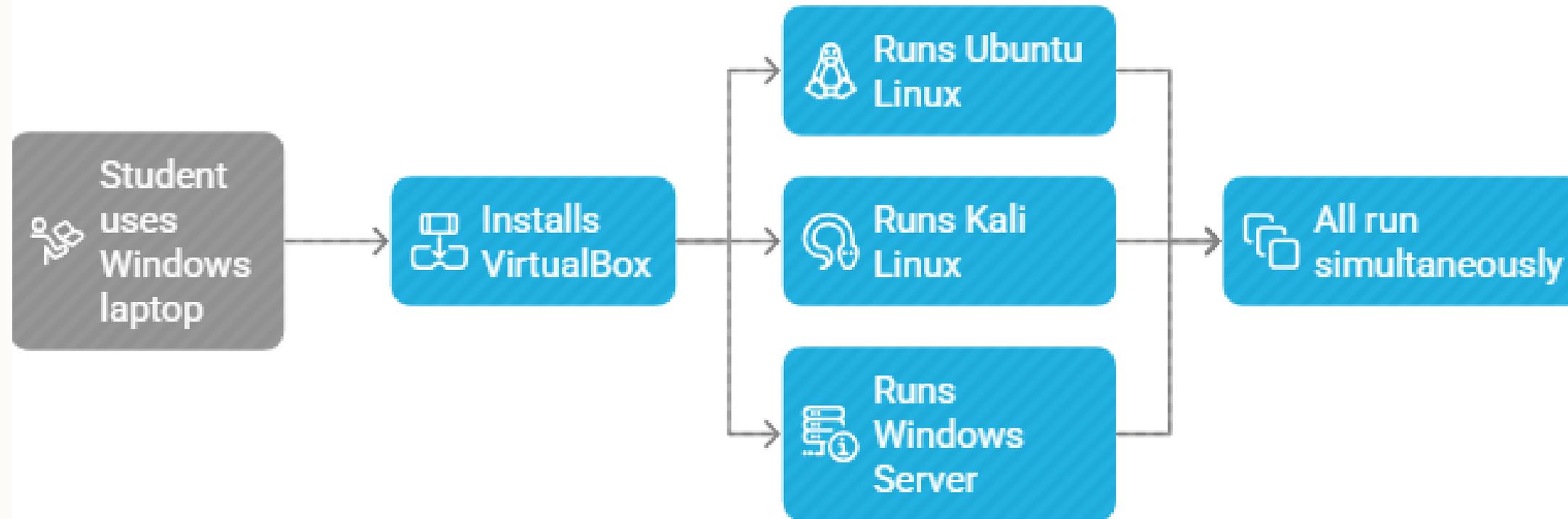
Oracle VM VirtualBox

Free and open-source solution

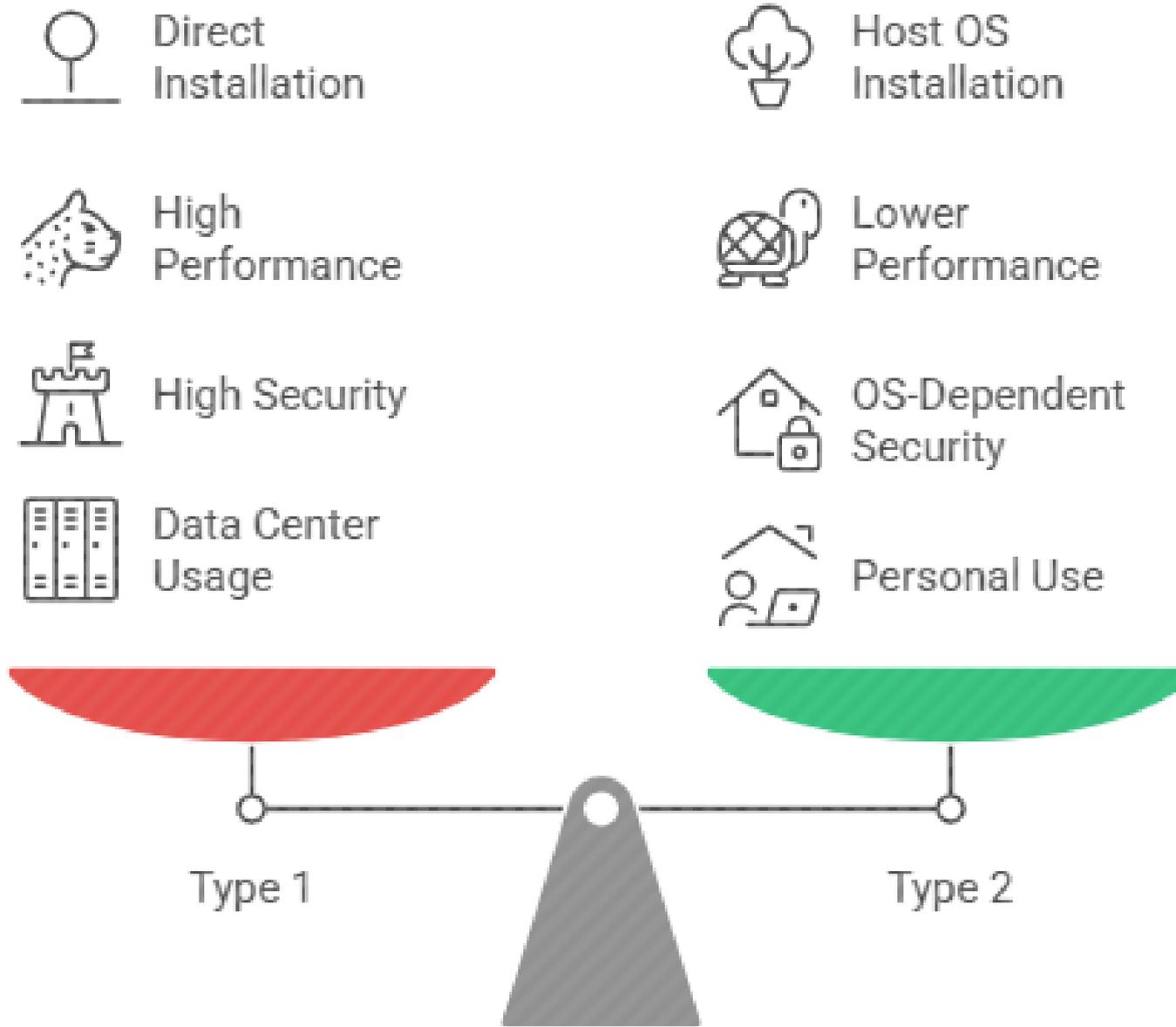
VMware Workstation

Robust product for different OS

VirtualBox Installation and Usage

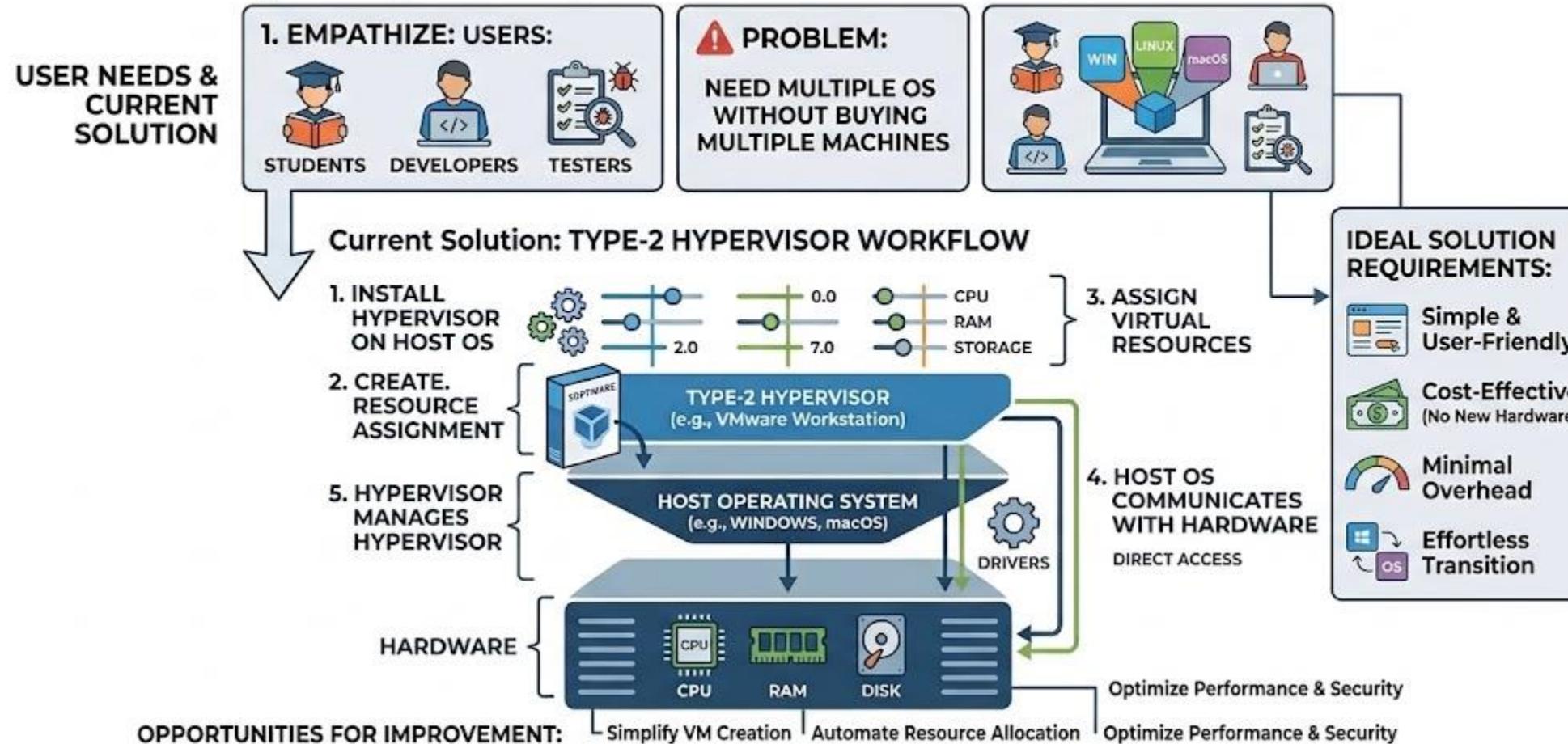


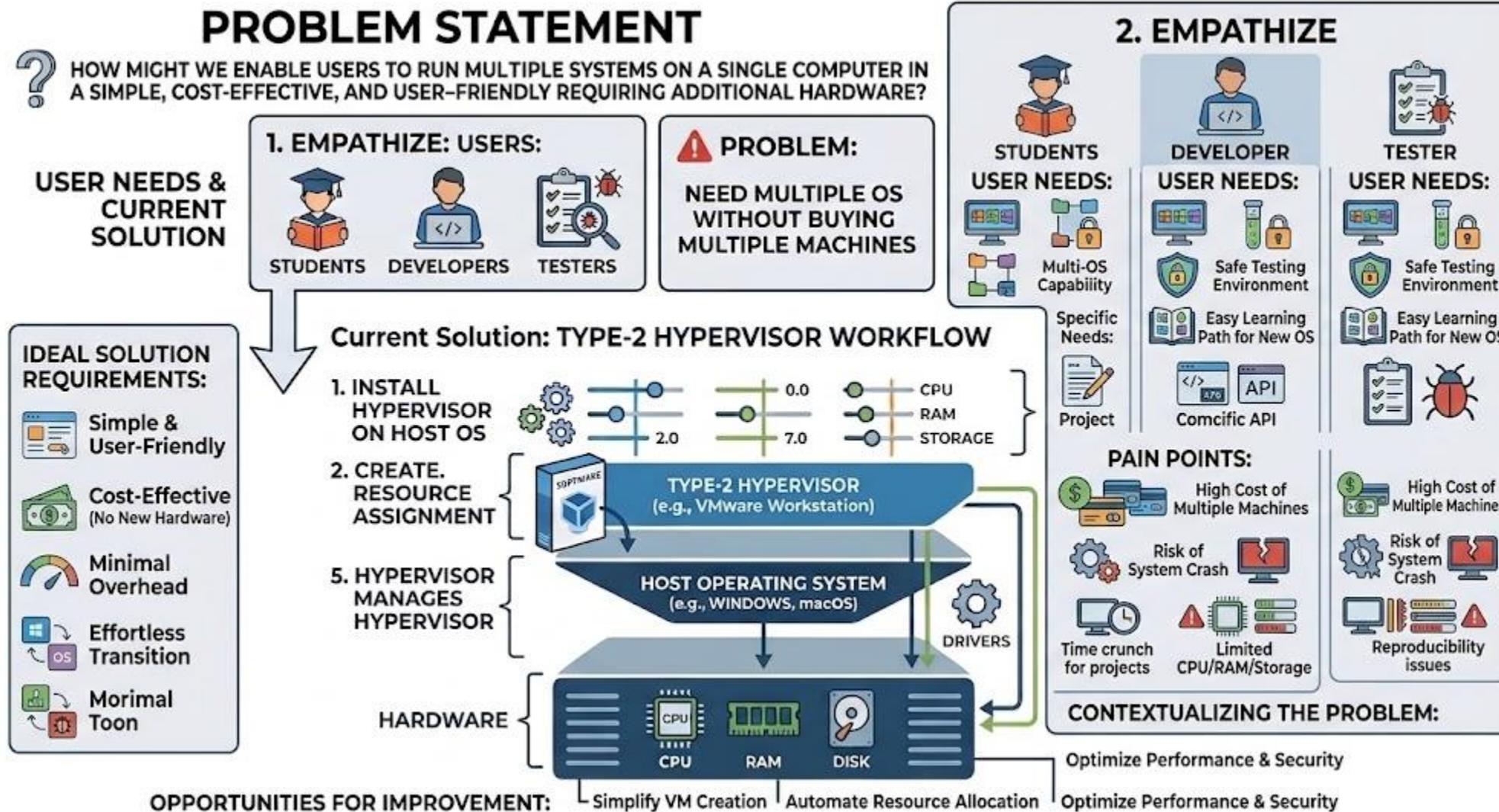
Compare Type 1 and Type 2 for your needs.



PROBLEM STATEMENT

? HOW MIGHT WE ENABLE USERS TO RUN MULTIPLE OPERATING SYSTEMS ON A SINGLE COMPUTER IN A SIMPLE, COST-EFFECTIVE, AND USER-FRIENDLY WAY WITHOUT REQUIRING ADDITIONAL HARDWARE?





IDEAL SOLUTION REQUIREMENTS:

- Simple & User-Friendly
- Cost-Effective (No New Hardware)
- Minimal Overhead
- Effortless Transition
- Morimal Toon

Current Solution: TYPE-2 HYPERVISOR WORKFLOW

- INSTALL HYPERVISOR ON HOST OS
- CREATE RESOURCE ASSIGNMENT
- HYPERVISOR MANAGES HYPERVISOR

HARDWARE: CPU, RAM, DISK

SOFTWARE: TYPE-2 HYPERVISOR (e.g., VMware Workstation), HOST OPERATING SYSTEM (e.g., WINDOWS, macOS)

DRIVERS: Connect hardware to OS and hypervisor.

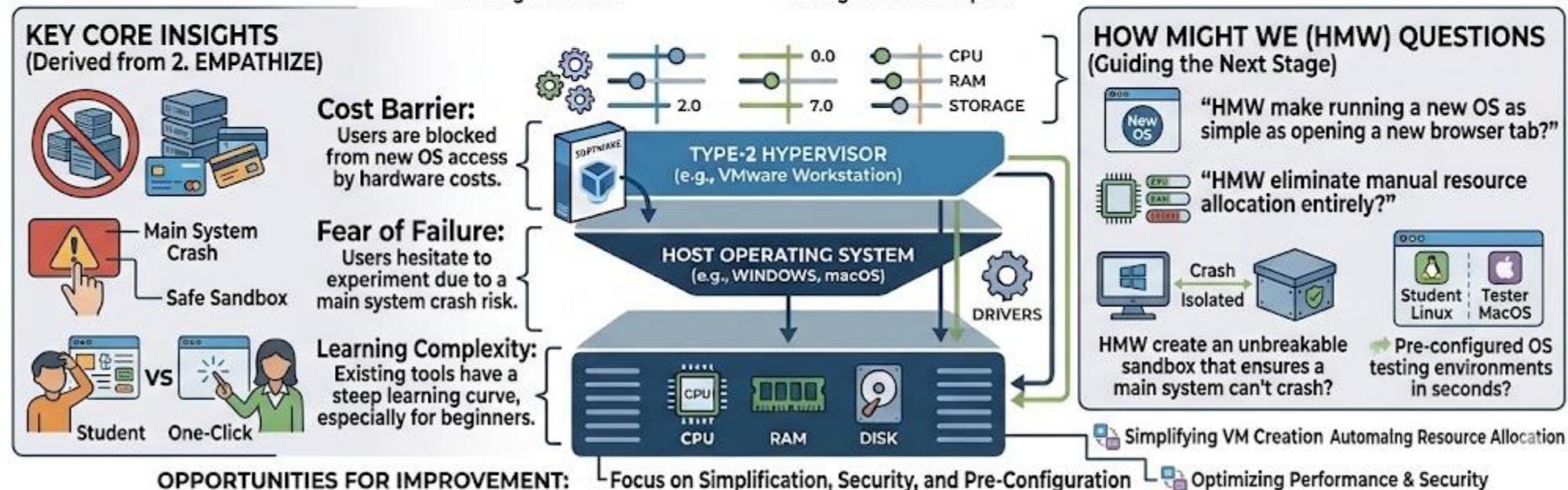
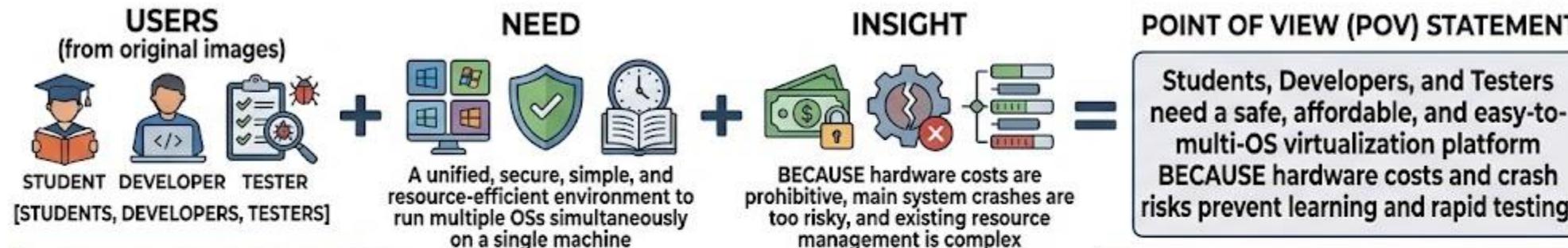
OPPORTUNITIES FOR IMPROVEMENT:

- Simplify VM Creation
- Automate Resource Allocation
- Optimize Performance & Security

PROBLEM-SOLVING FRAMEWORK: DEFINE STAGE

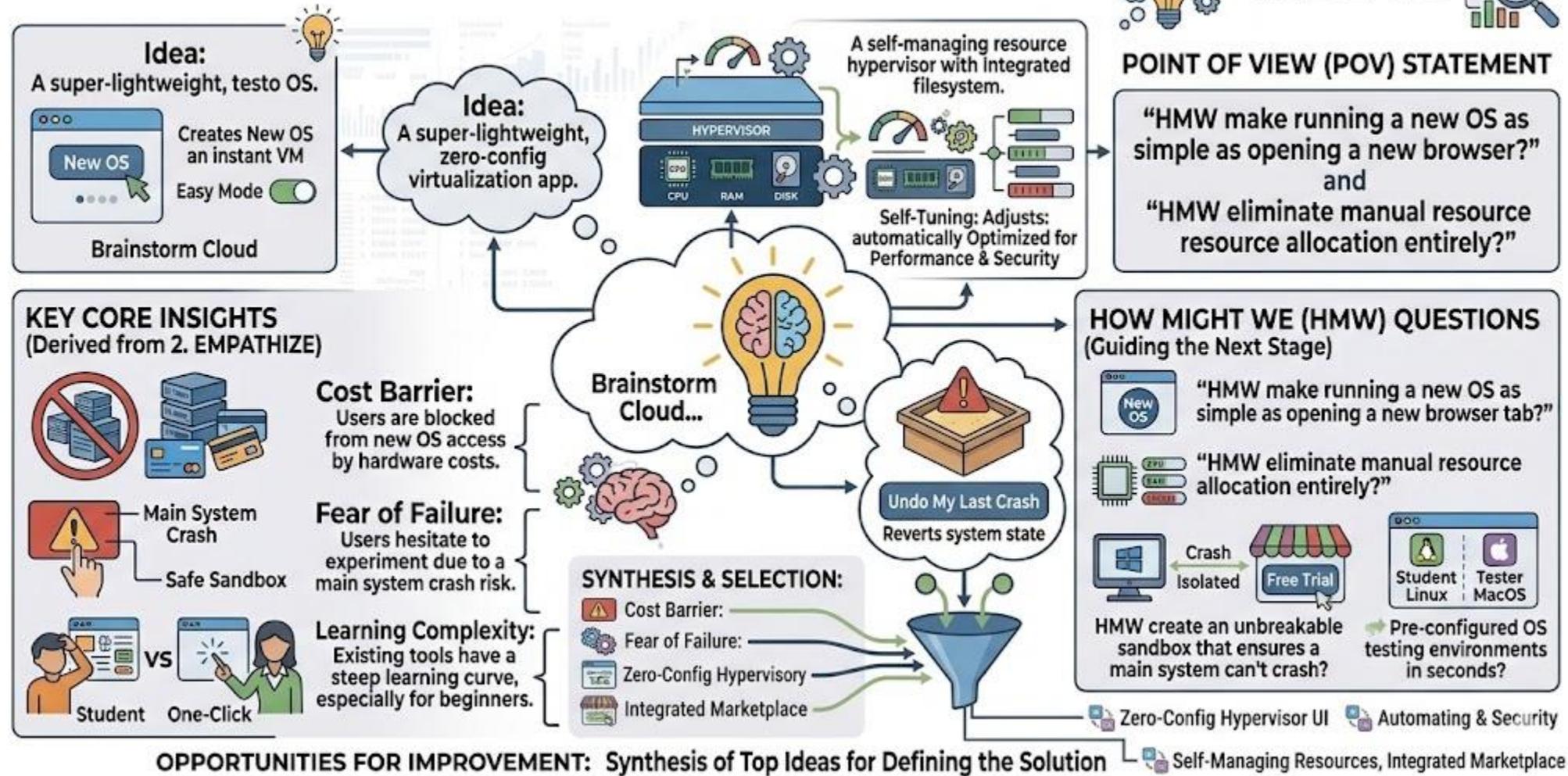


3. DEFINE

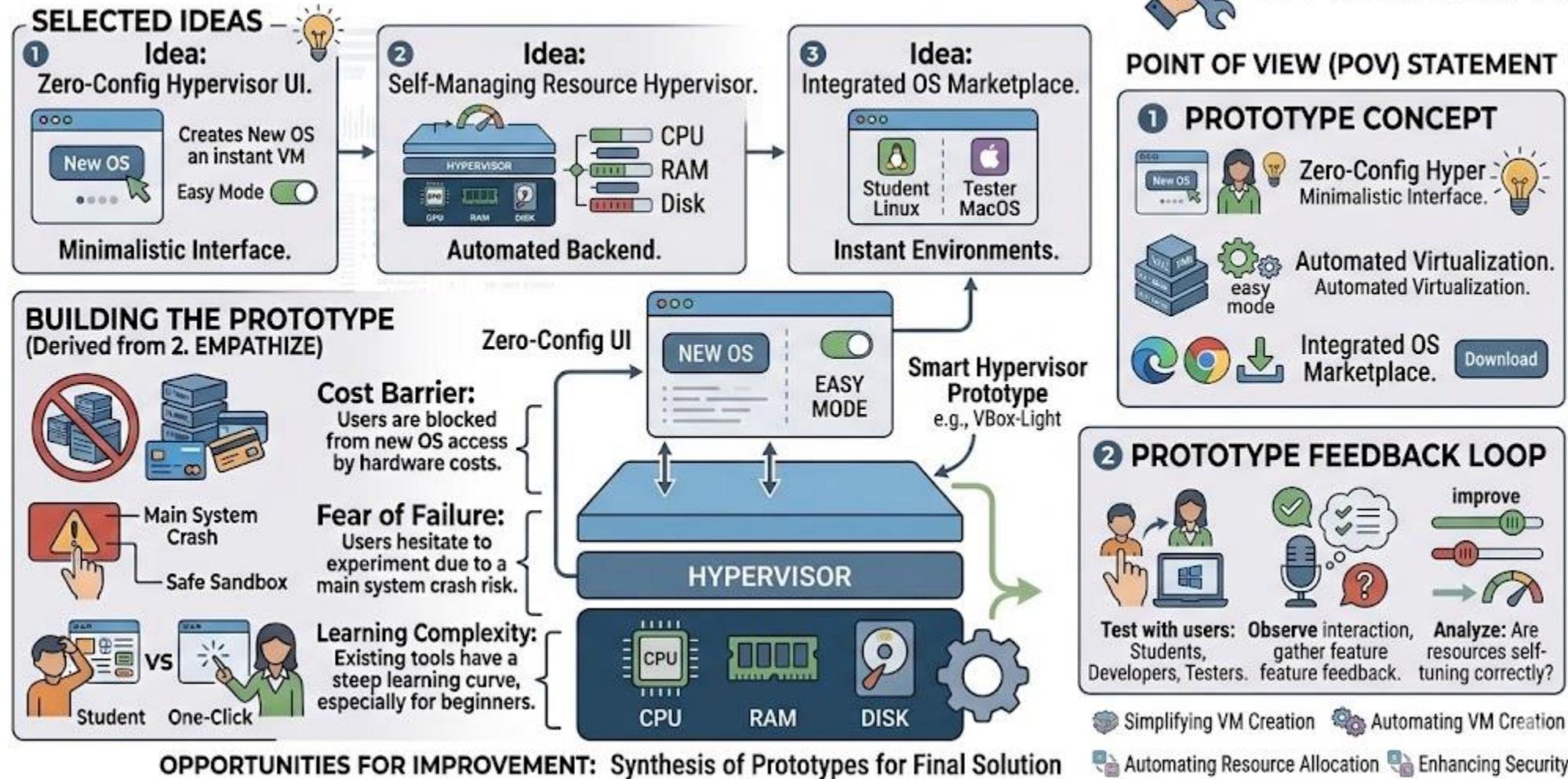


PROBLEM-SOLVING FRAMEWORK: IDEATE STAGE

4. IDEATE



PROBLEM-SOLVING FRAMEWORK: PROTOTYPE STAGE 5. PROTOTYPE



PROBLEM-SOLVING FRAMEWORK: TESTING STAGE



6. TESTING

