

SNS COLLEGE OF TECHNOLOGY

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COIMBATORE-641 035, TAMIL NADU



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course Code & Name : 23CST206-OPERATING SYSTEMS AND VIRTUALIZATION
Class : II CSE
Course Faculty : Ms.R.SWATHIRAMYA

Question Bank

UNIT-IV

🧩 Puzzle 1: Identify the Type

A system runs multiple guest OS directly on hardware without a host OS.
What type of virtualization is this?

💡 Hint:

Think "bare metal" — no middle layer OS.

☑ Answer:

👉 Hardware-assisted / Type 1 Virtualization (Bare Metal Hypervisor)

🧩 Puzzle 2:

Identify the Type

A system runs multiple guest OS directly on hardware without a host OS.
What type of virtualization is this?

Hint:
Think "bare metal" — no middle layer OS.

Answer:
👉 **Hardware-assisted / Type 1 Virtualization (Bare Metal Hypervisor)**

HARDWARE-ASSISTED / TYPE 1 VIRTUALIZATION (Bare Metal Hypervisor)

🧩 Puzzle 3: Translation Trick

A virtualization method modifies and translates guest OS instructions at runtime because the hardware is not fully virtualizable.

Which technique is used?

💡 Hint:

It “translates” instructions dynamically.

✅ Answer:

👉 Full Virtualization using Binary Translation

🧩 Puzzle 4:

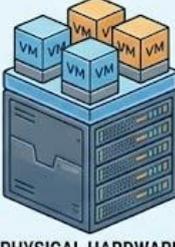
UNIT IV - VIRTUALIZATION PUZZLE

QUESTION

HINT

UNIT IV - VIRTUALIZATION

A cloud infrastructure uses multiple virtualization techniques for its server fleet. Can you identify which type matches which scenario?



Match the Scenarios:

A: 'Guest OS unmodified, very high performance'

B: 'Services are isolated, sharing the host kernel'

C: 'A special CPU extension is required for speed'

D: 'A legacy OS from 1980 must run on new hardware'

Match these scenarios to the types:

1: OS Virtualization	3: Hardware Emulation
2: Hardware Assisted	4: Full Virtualization

HINT

HINT: Focus on modification and performance needs. Key distinctions often lie in how the guest relates to the host kernel and hardware.

Unmodified Guest OS

CPU extension

Shared kernel

ANSWER

✅ - Scenario A: Full Virtualization

✅ - Scenario B: OS Virtualization

✅ - Scenario C: Hardware Assisted

✅ - Scenario D: Hardware Emulation

👉 Matchups:
(A,4), (B,1), (C,2), (D,3)

Result: ✔✔✔ * ÷

🧩 Puzzle 5: Fast but Modified

A system requires modifying the guest OS to interact efficiently with the hypervisor.
Which virtualization type is this?

💡 Hint:

Guest OS is aware of virtualization.

✅ Answer:

👉 Paravirtualization (OS-assisted Virtualization)

🧩 Puzzle 6:

UNIT IV - VIRTUALIZATION PUZZLE

QUESTION

UNIT IV - VIRTUALIZATION

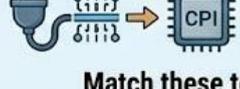
A data center admin is planning a deployment. Can you match the deployment **GOALS** with the appropriate virtualization **TECHNOLOGY**?



Cloud Provider A Cloud Provider B



Guest OS Abstraction



CPI

Match the Scenarios:

Goal A: Achieve very high portability of server instances between different physical hosts and cloud providers

Goal B: Ensure a non-X86 instruction set OS can run efficiently on new X86-64 hardware

Goal C: Enable high-speed direct access to a specific optimized I/O hardware device for performance

Goal D: Implement a hypervisor that runs directly on the bare metal, without a host OS

Match these technologies for to types:

1: Type-1 (Bare-Metal) Hypervisor	3: Hardware Emulation
2: Paravirtualization (API modified)	4: Full Virtualization (Unmodified binary)

HINT

HINT: Look for specific hardware dependencies, the directness of hardware access, and whether-cations are made to the Guest OS or Hypervisor itself.

 Bare Metal vs Host OS Direct vs. Indirect Access vs API Modified Guest OS Driver

ANSWER

- ✅ - **Goal A: Full Virtualization** (for high portability with binary compatibility)
- ✅ - **Goal B: Hardware Emulation** (for non-native instruction sets)
- ✅ - **Goal C: Paravirtualization** (often uses optimized modified drivers for direct I/O)
- ✅ - **Goal D: Type-1 Hypervisor** (for bare metal)

👉 **Matches:** (A,4), (B,3), (C,2), (D,1).

Result: ✅✅✅ * ÷

🧩 Puzzle 7: Same OS Rule

Multiple applications run in isolated environments, but all share the same OS kernel.
Which virtualization is this?

💡 Hint:

No separate guest OS, only containers-like behavior.

✅ Answer:

👉 Operating System Virtualization (Container-based)