

DEPARTMENT OF BIOMEDICAL ENGINEERING

Course Code & Name : **23BME307-Body Area Networks**

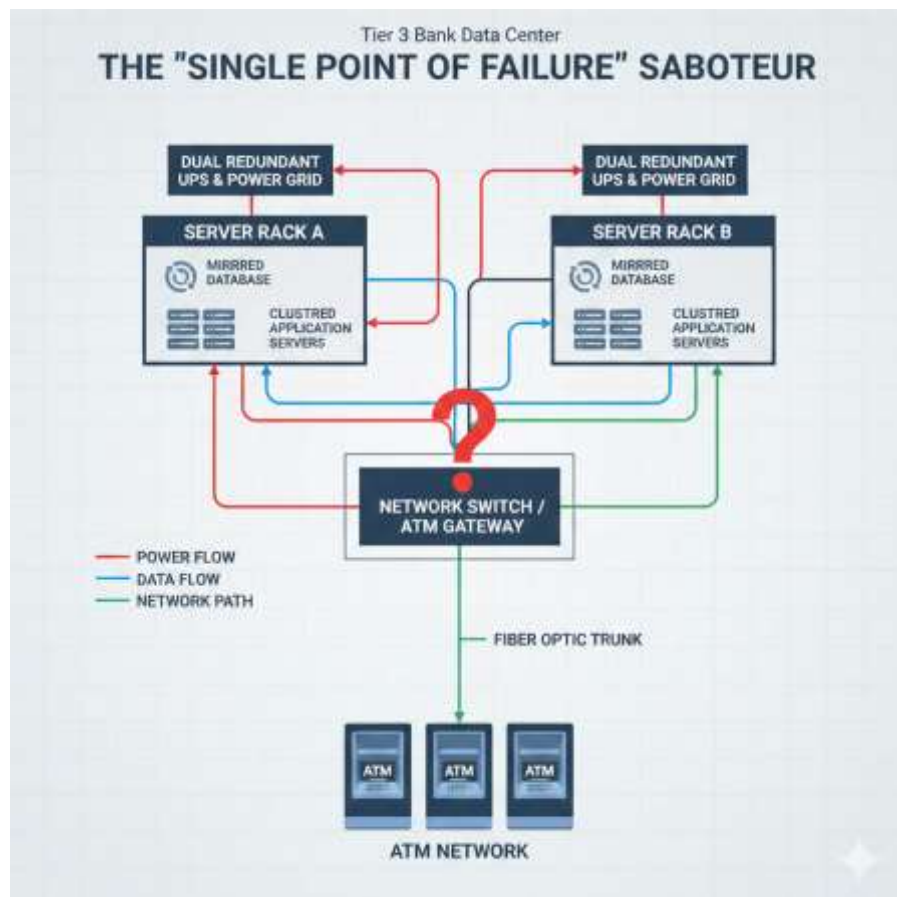
Course Faculty : Dr.Karthika A,AP/BME

Puzzles / In Class Activities

Topics Covered – Unit II : HARDWARE ARCHITECTURE FOR BAN

Puzzle 1: The "Single Point of Failure" Saboteur

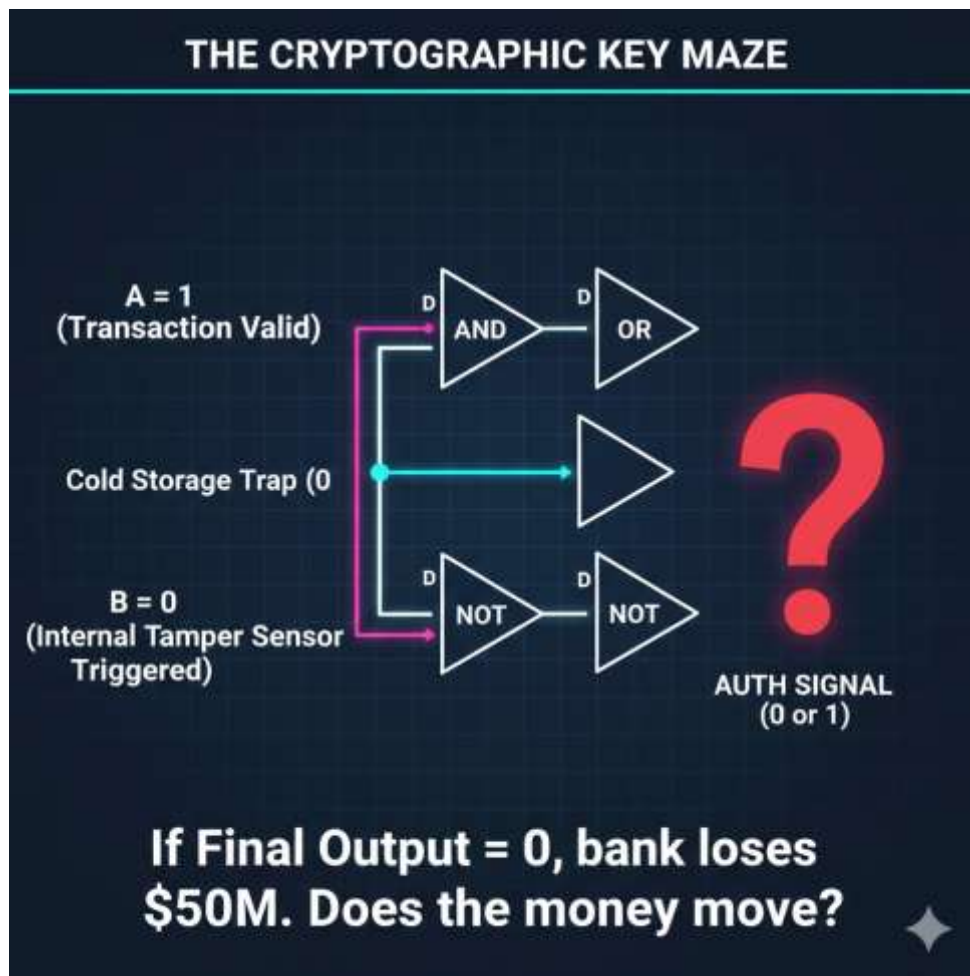
Scenario: Below is a simplified diagram of a Tier 3 Data Center for a bank. Your task is to identify the **one component** that, if it fails, brings down the entire ATM network despite the redundancy shown in other parts.



The Puzzle: Trace the flow. Look at the Power, Data, and Network layers. Identify the specific bottleneck.

Your Task: Name the component and explain why the "Redundant" tag on the other parts is currently useless.

Puzzle 2: The Cryptographic Key Maze

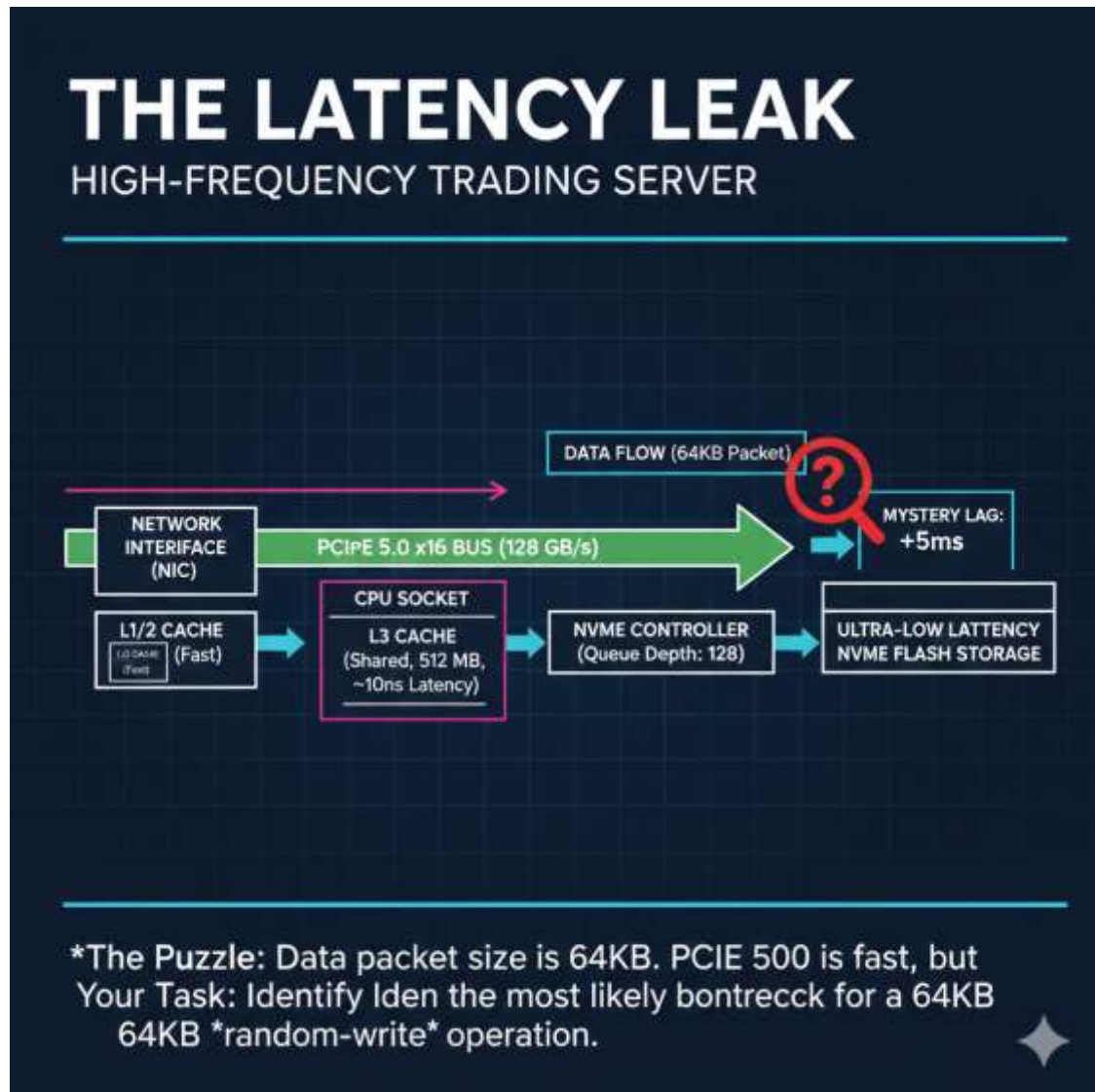


The Puzzle: Given inputs A=1 (Transaction Valid) and B=0 (Internal Tamper Sensor Triggered), calculate the final output of the circuit.

Your Task: Provide the final binary output (0 or 1). If it's 0, the bank loses \$50M. Does the money move?

Puzzle 3: The Latency Leak

Scenario: Your High-Frequency Trading (HFT) server is experiencing a 5ms lag—an eternity in banking. You have three potential culprits in the hardware stack: the **L3 Cache**, the **PCIe Bus**, or the **NVMe Controller**.



The Puzzle: The data packet size is 64KB. The PCIe 5.0 lane is running at x16, but the NVMe controller is reporting a queue depth of 128.

Your Task: Based on the architecture diagram, identify which "bridge" is the most likely bottleneck for a 64KB *random-write* operation.