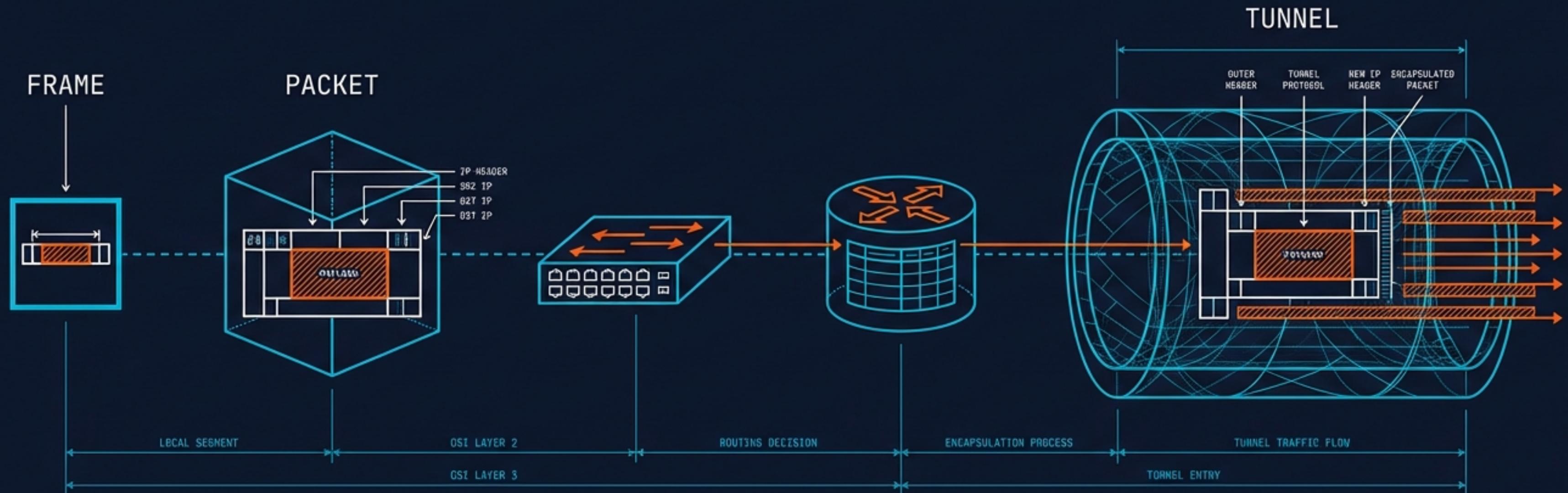


Rajdhani

FROM FRAMES TO TUNNELS

JetBrains Mono

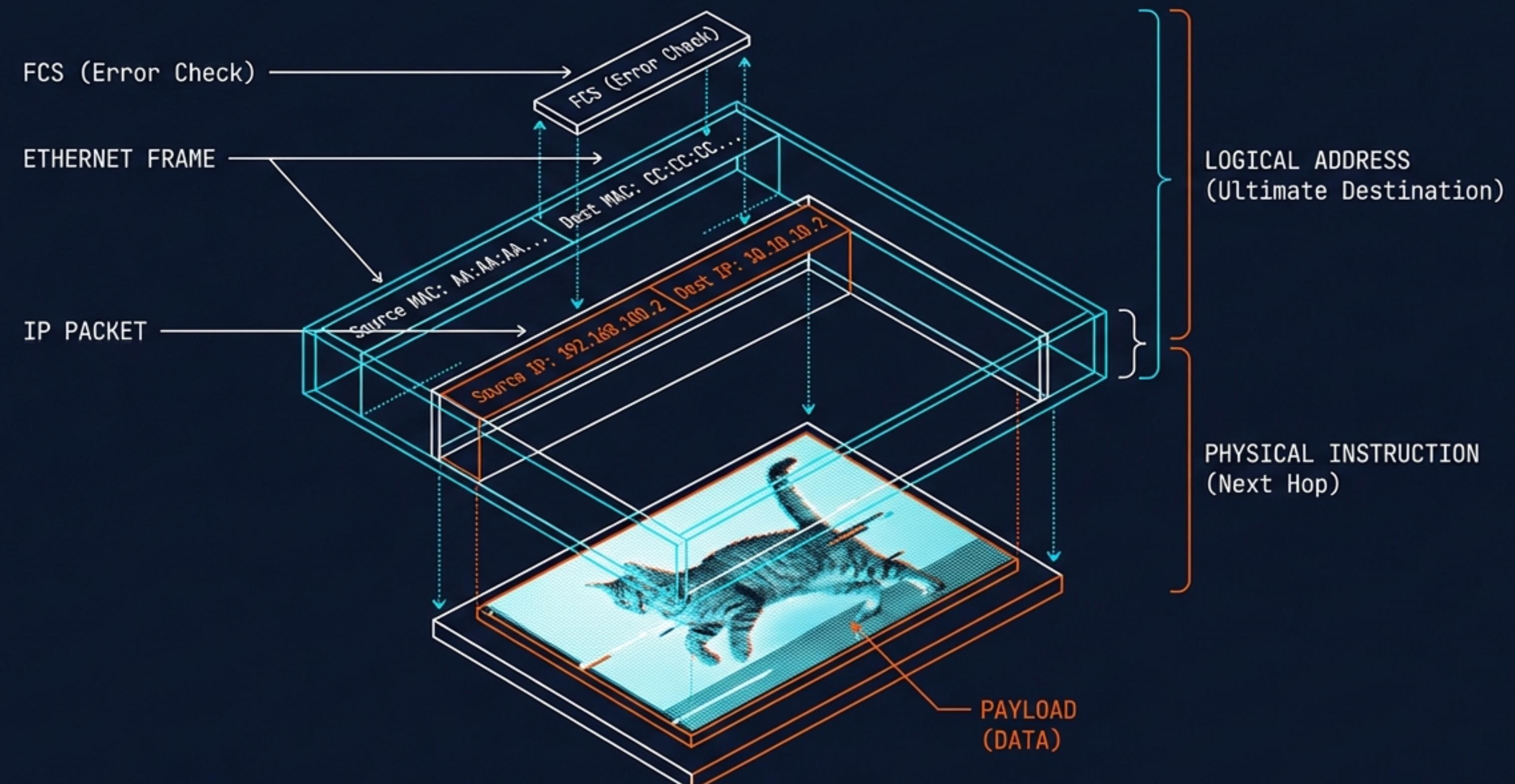
A VISUAL GUIDE TO NETWORK ARCHITECTURE



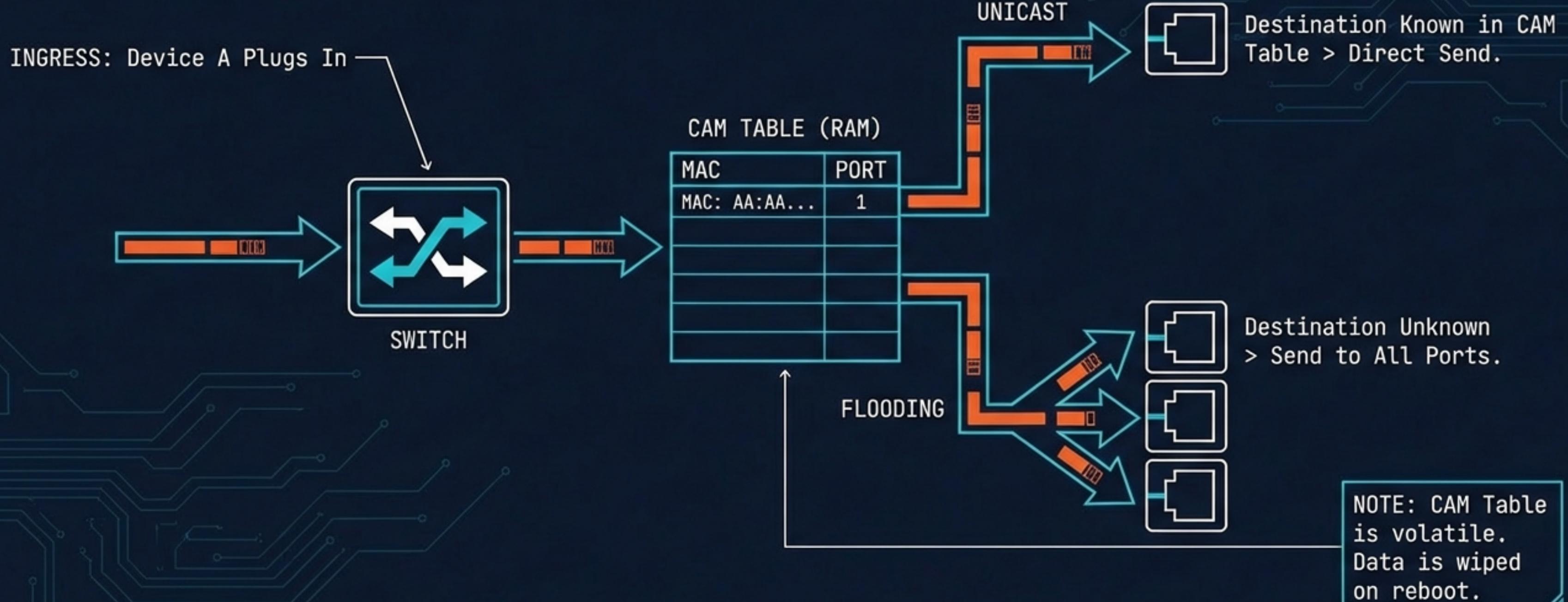
JetBrains Mono

SCOPE: DATA UNIT > LOCAL SWITCHING > VLAN SEGMENTATION > ROUTING > ENCAPSULATION

THE ANATOMY OF A DIGITAL SHIPMENT

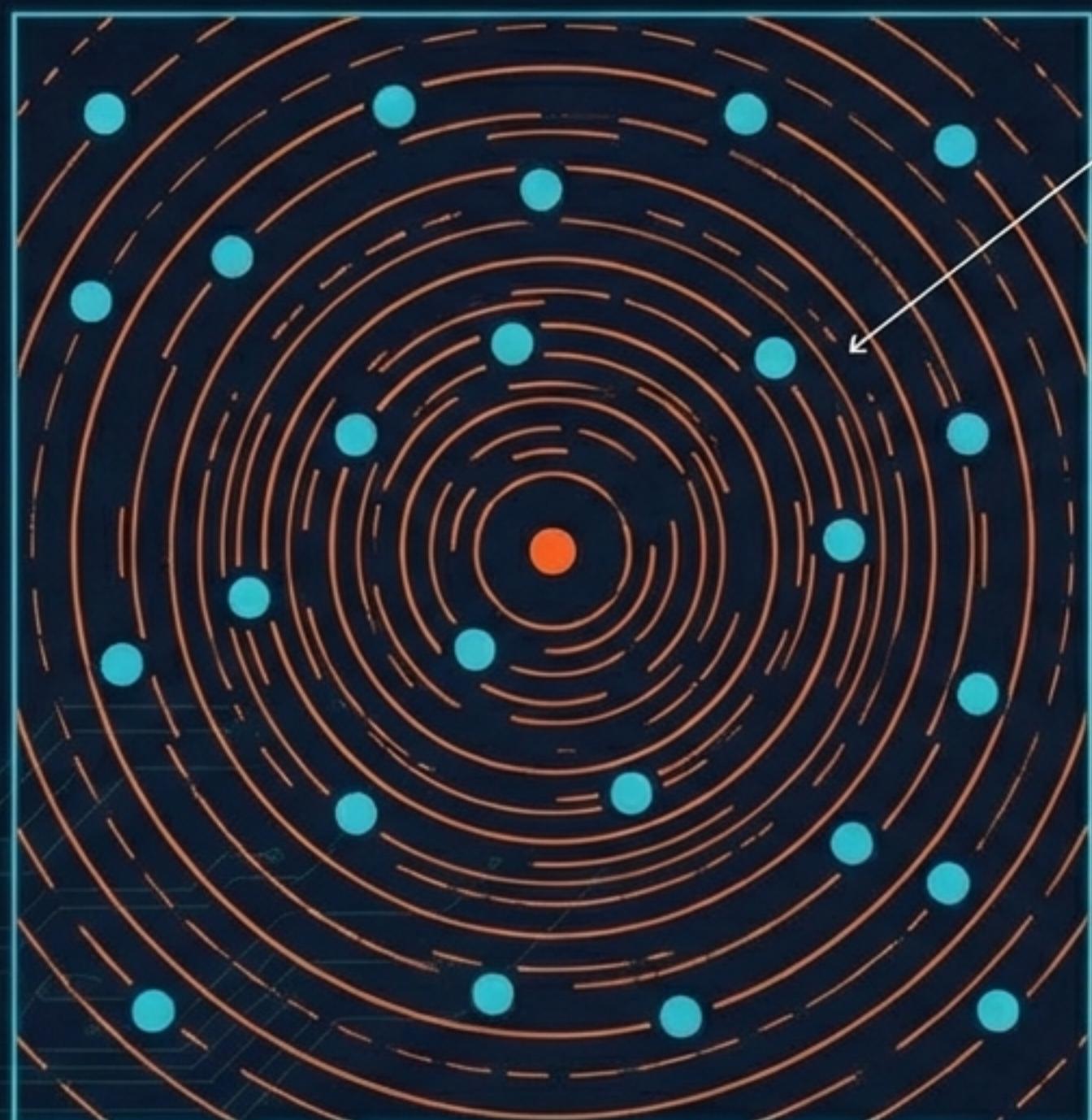


THE LOCAL TRAFFIC COP: HOW SWITCHES THINK



THE NOISE PROBLEM

THE FLAT NETWORK



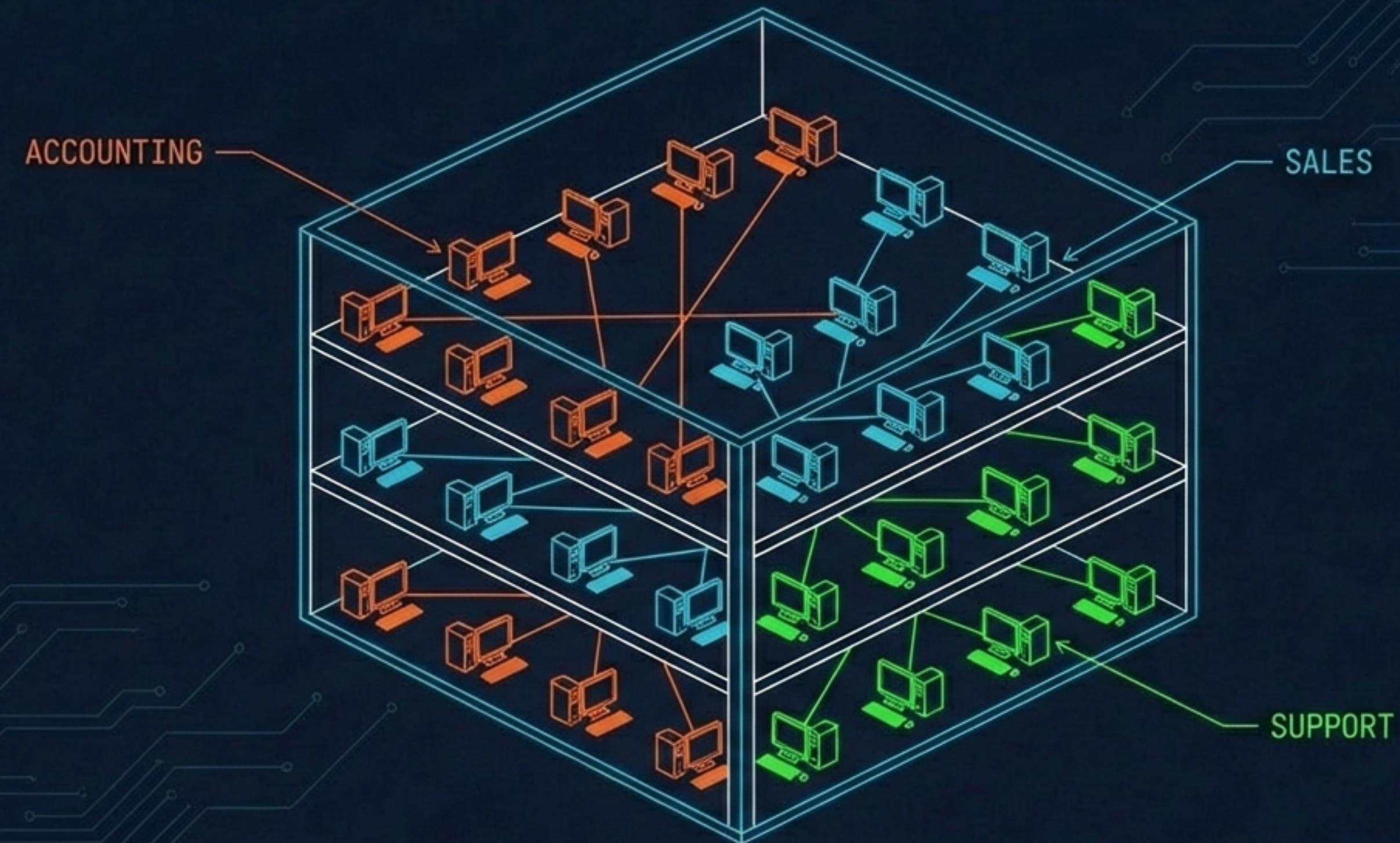
BROADCAST TRAFFIC
(ARP, DHCP, Printers)

CONSEQUENCES

1. SECURITY RISK:
Management data mixes with Guest data.
2. PERFORMANCE HIT:
Every device must process every shout.
3. COLLISION DOMAIN:
Isolated per port, but Broadcast Domain is the entire switch.

NOTE:

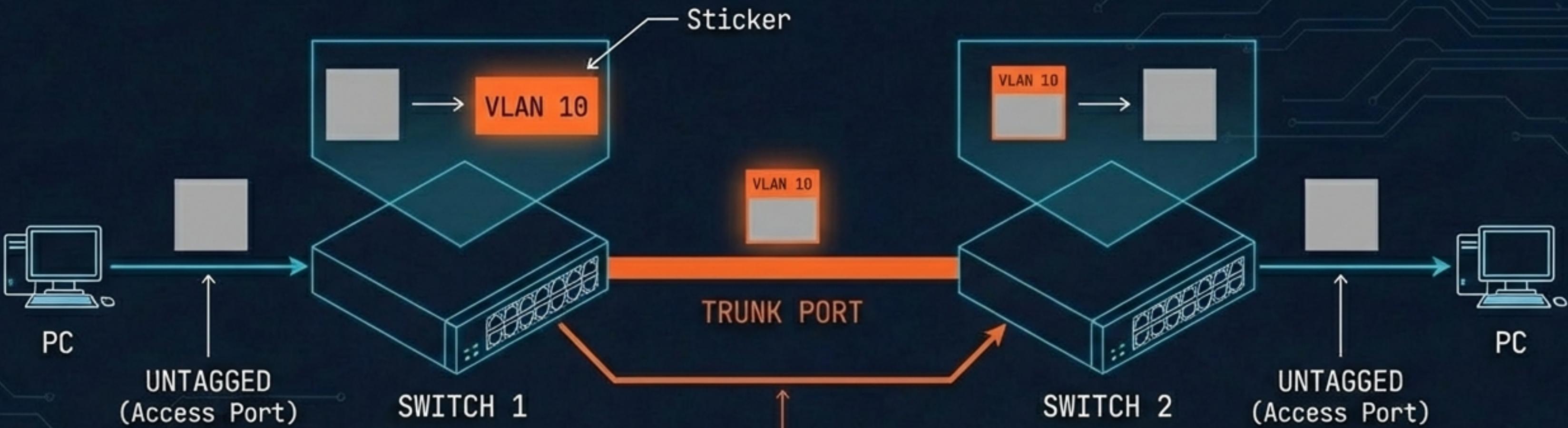
VIRTUAL WALLS: LOGIC OVER LOCATION



KEY: VLAN = Logical Grouping independent of physical location.

DATA NO. 50-109-001
DATE: MTS
SERIAL #: S1021A1, FLOW S1810NS

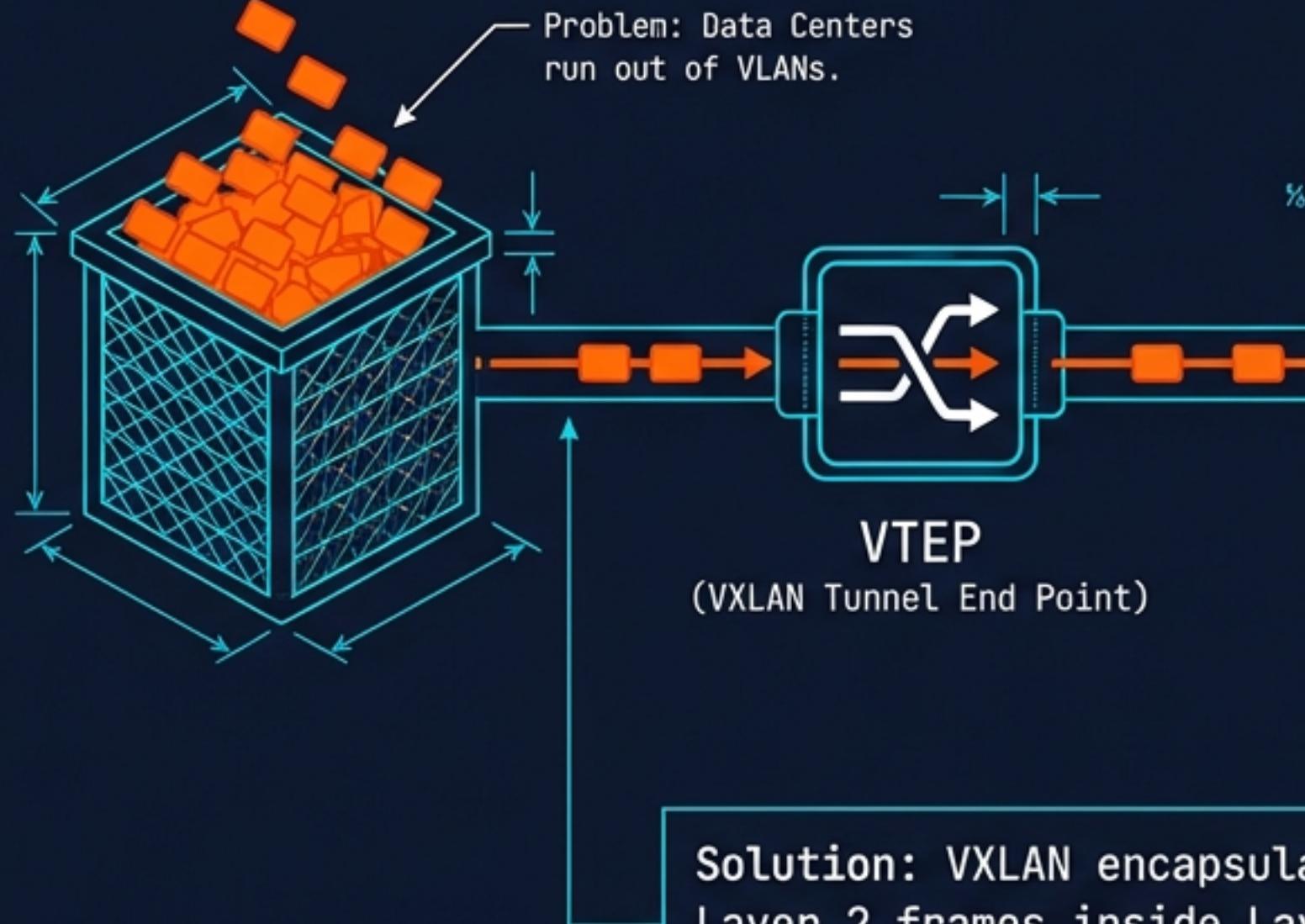
THE LANGUAGE OF TAGS: 802.1Q



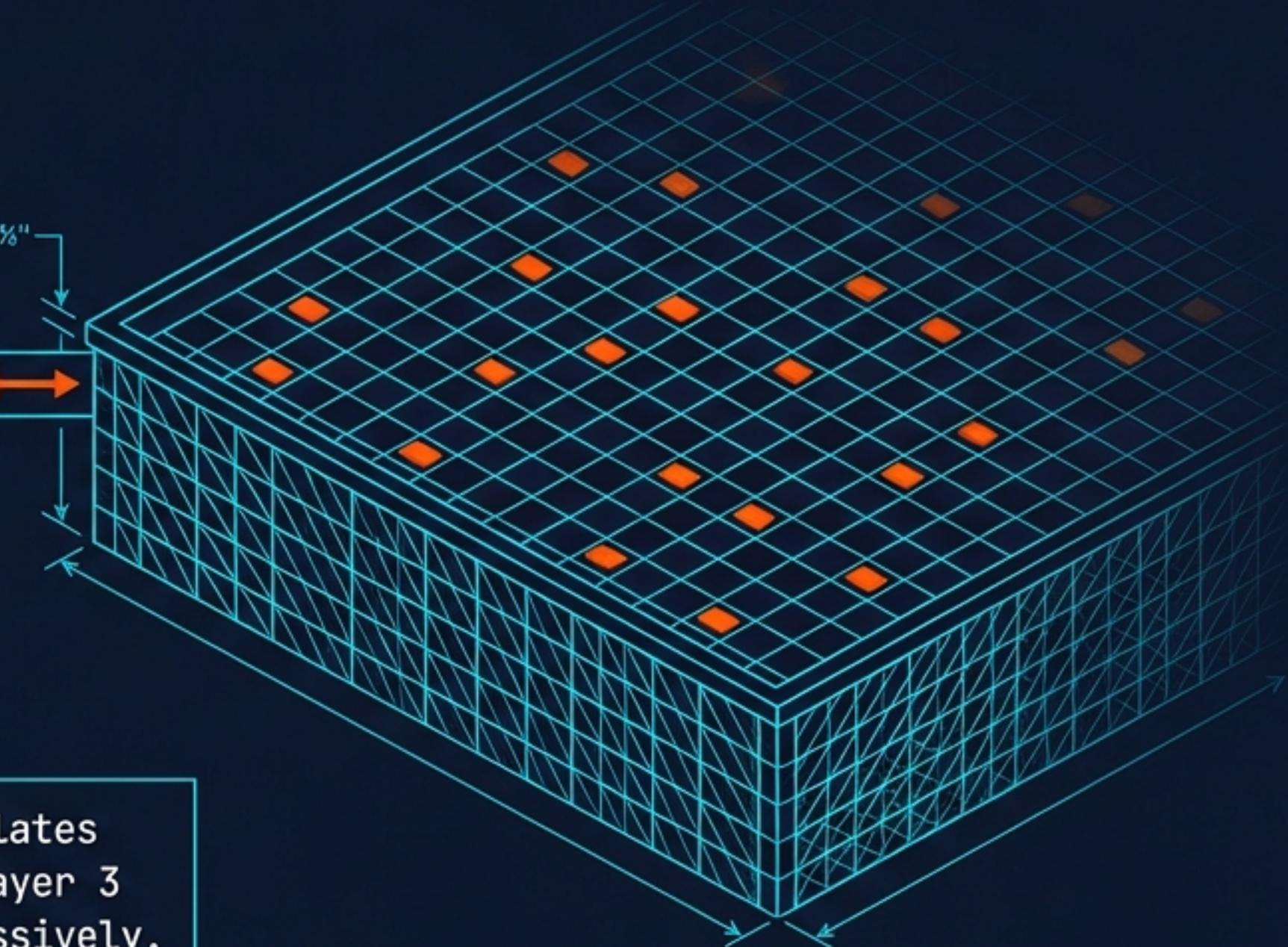
NATIVE VLAN: Traffic that travels the trunk without a sticker.

BREAKING THE LIMIT: SCALING WITH VXLAN

VLAN LIMIT: 4,096 IDs



VXLAN LIMIT: ~16 MILLION IDs



Solution: VXLAN encapsulates Layer 2 frames inside Layer 3 UDP packets to scale massively.

OANDAO

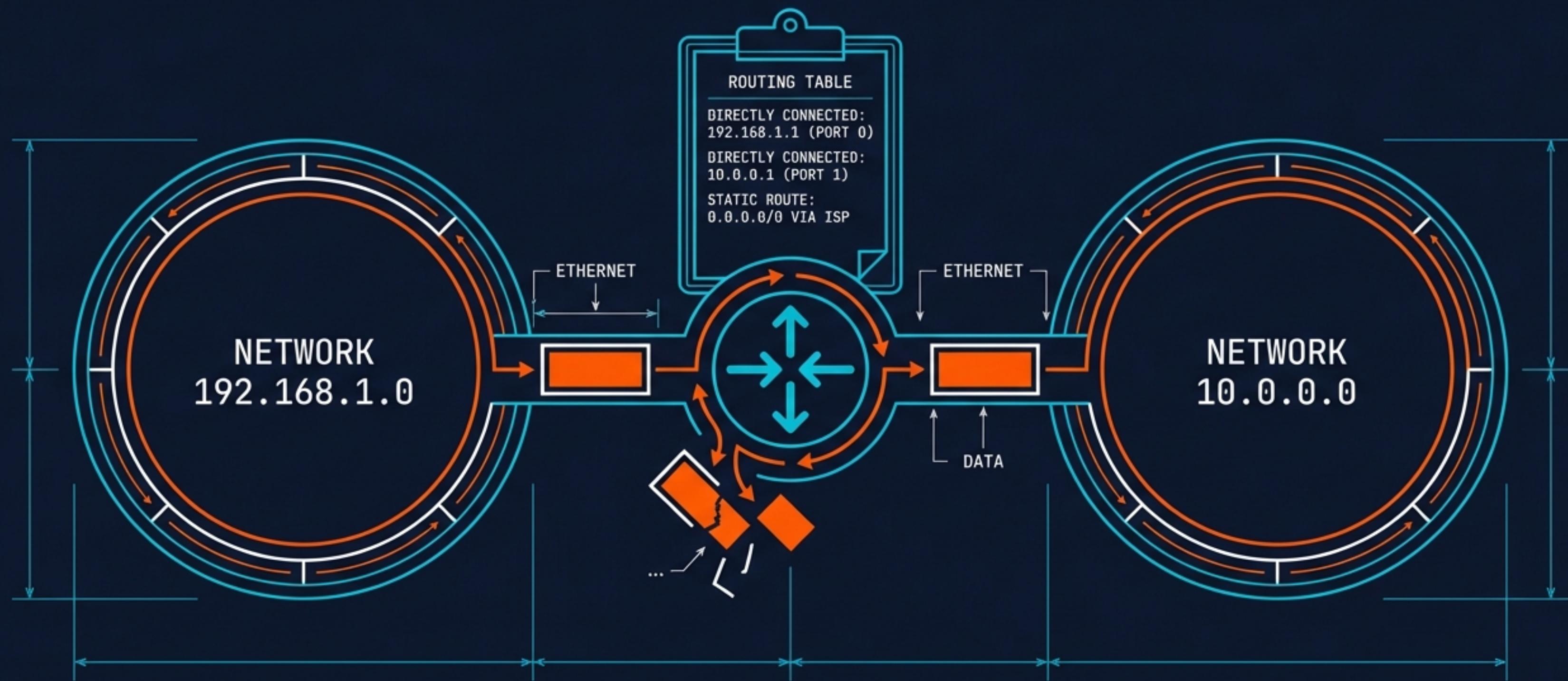
NO. 30-205-003

REV. A

SCALE: NTS

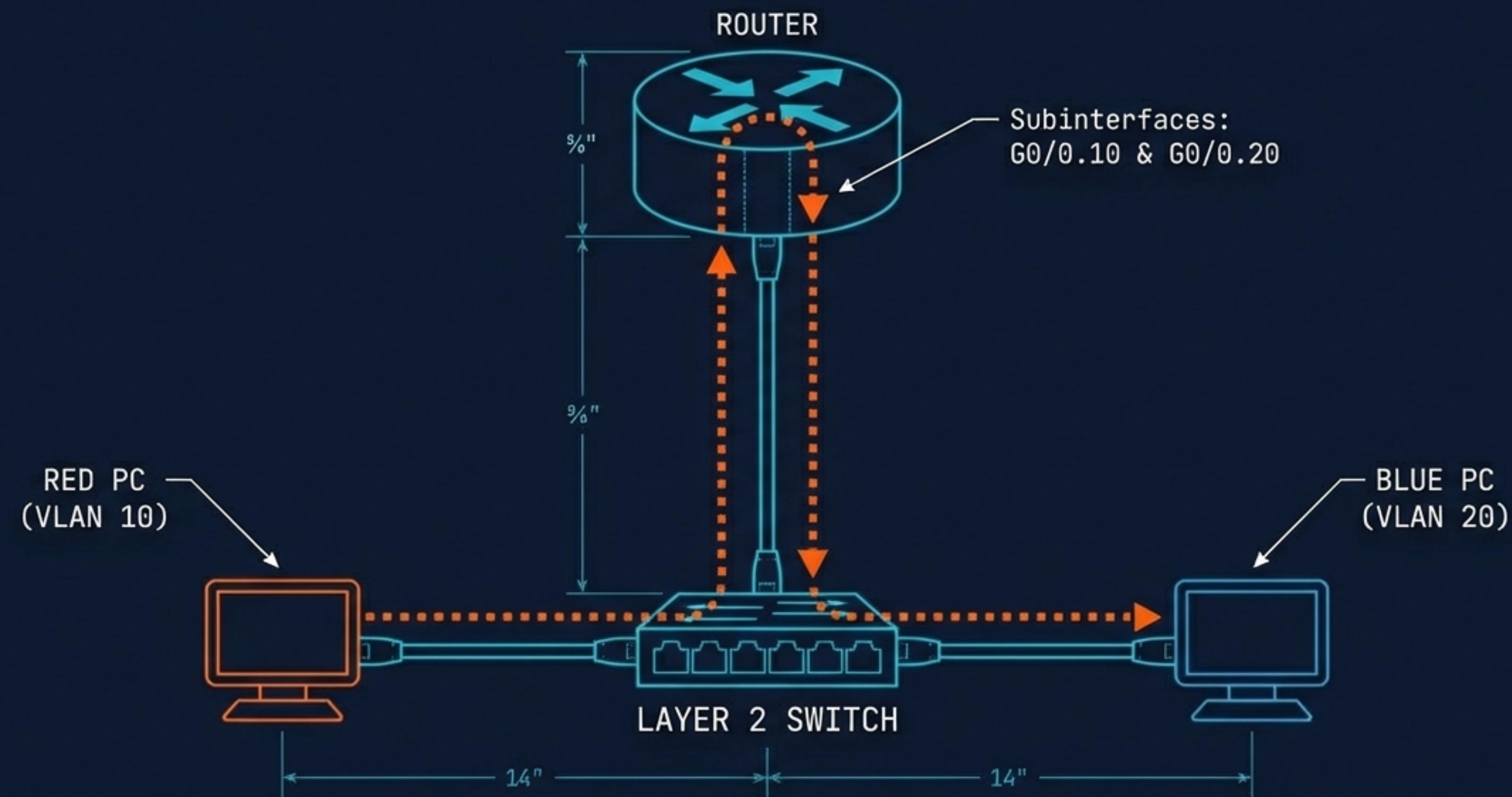
ENGINEER: S1021A1 HI-LOV DATIONS

THE GATEWAY: ESCAPING THE LOCAL NETWORK



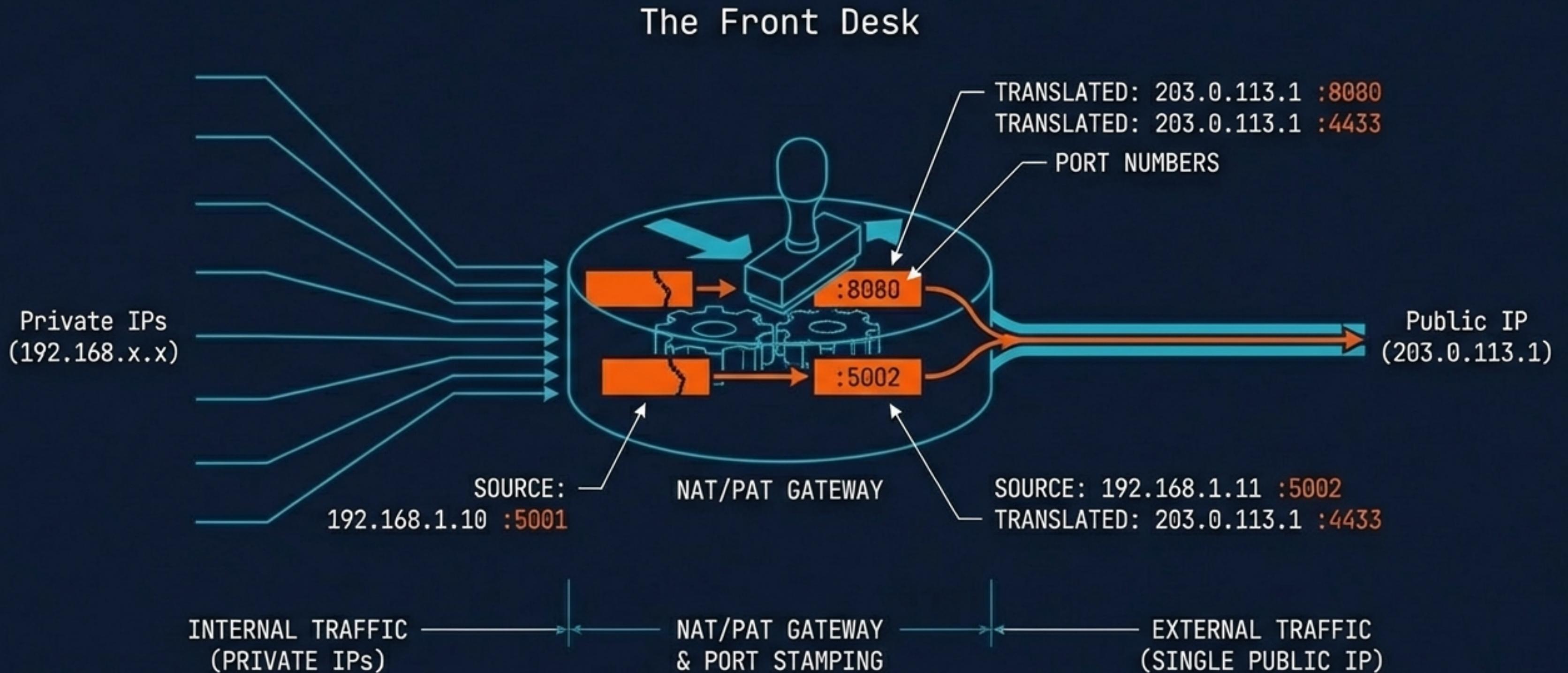
| | | |
|------------|------------------------|-----------|
| OANDA0 | NO. 30-205-004 | REV. A |
| SCALE: NTS | ENGINEER: S1021A1.HLOK | 9461DNS |

INTER-VLAN ROUTING: ROUTER-ON-A-STICK



| | | |
|------------|--------------------------------|------------|
| OANDAØ | NO. 30-205-005 | REV. A |
| SCALE: NTS | ENGINEER: S1021AI.NLBK 9461DNS | NotebookLM |

Rajdhani: ADDRESSING THE WORLD: NAT & PAT

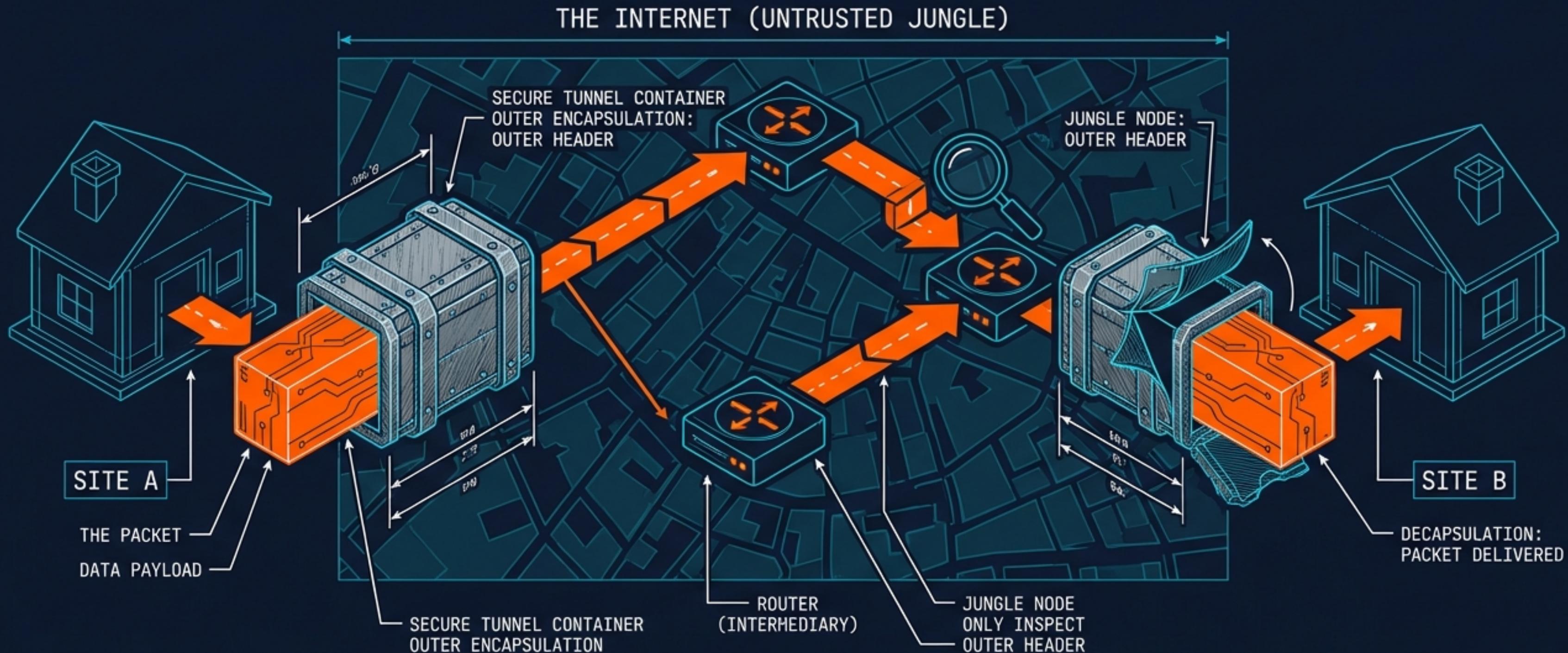


JetBrains Mono

PAT (Port Address Translation) allows an entire office to share one Public IP address.

| | | |
|------------|--------------------------------|------------|
| OANDA0 | NO. 30-205-006 | REV. A |
| SCALE: NTS | ENGINEER: S1021AI.NLBK 9A61DNS | NotebookLM |

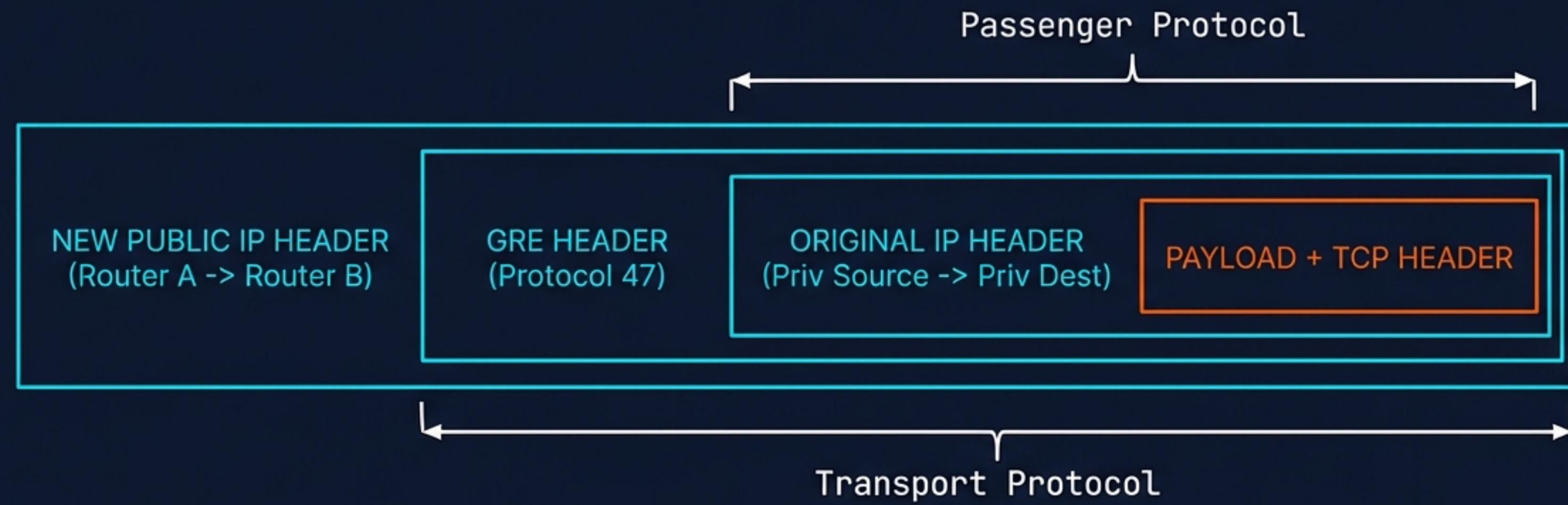
THE JUNGLE TRANSPORT: TUNNELING LOGIC



OANDAO

NO. 30-205-007
SCALE: NTS
REV. A
ENGINEER: S1821AT.NLOK 94610NS

UNDER THE HOOD: ENCAPSULATION HEADERS

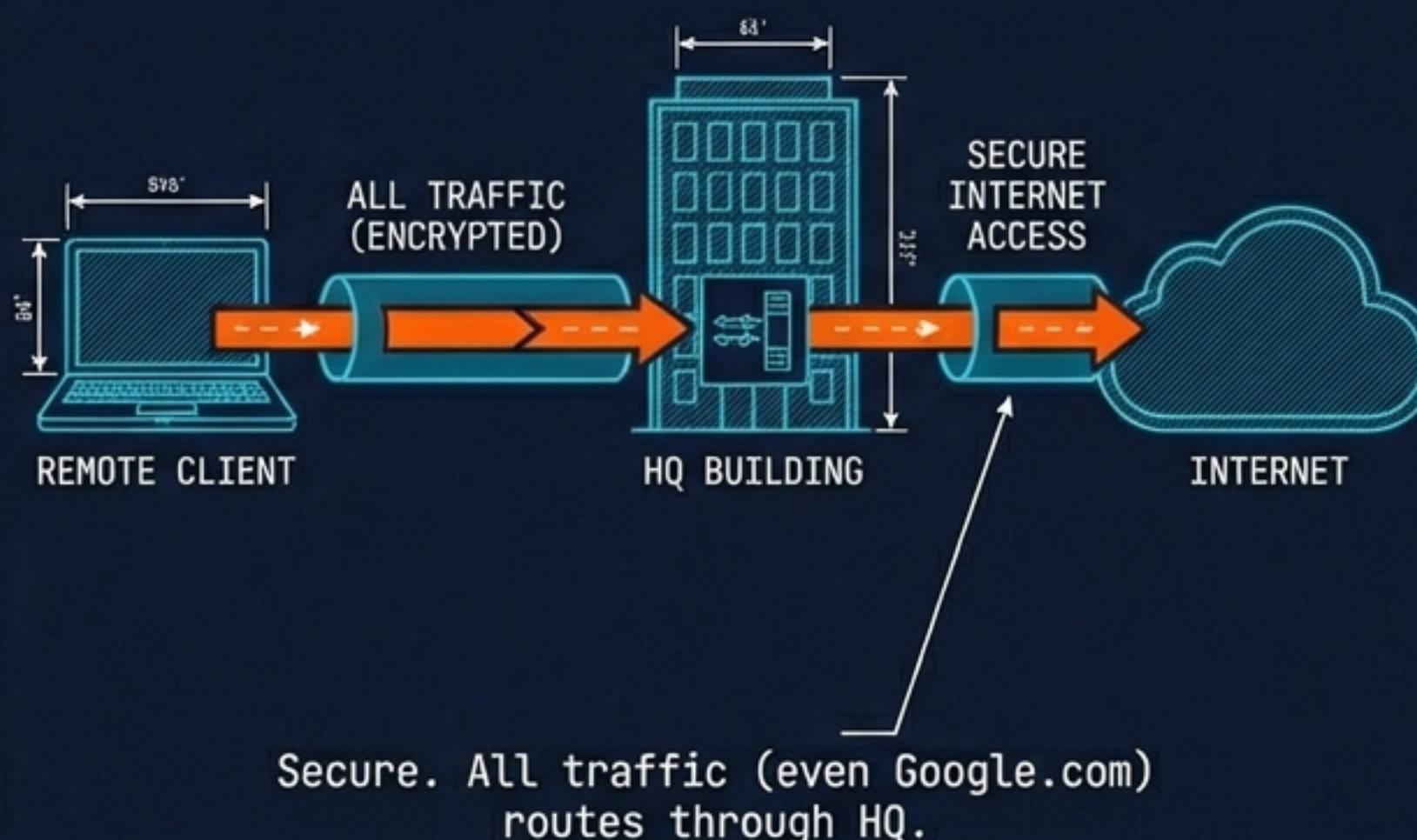


The Internet only reads the Outer Header. The original packet is hidden.

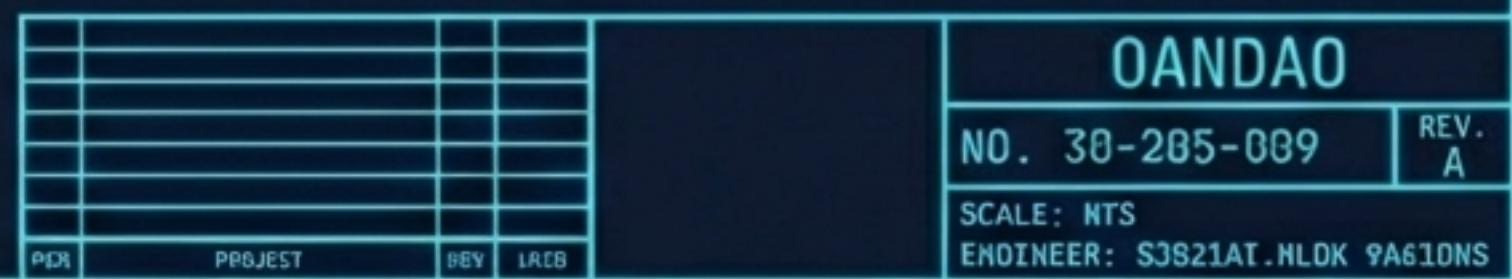
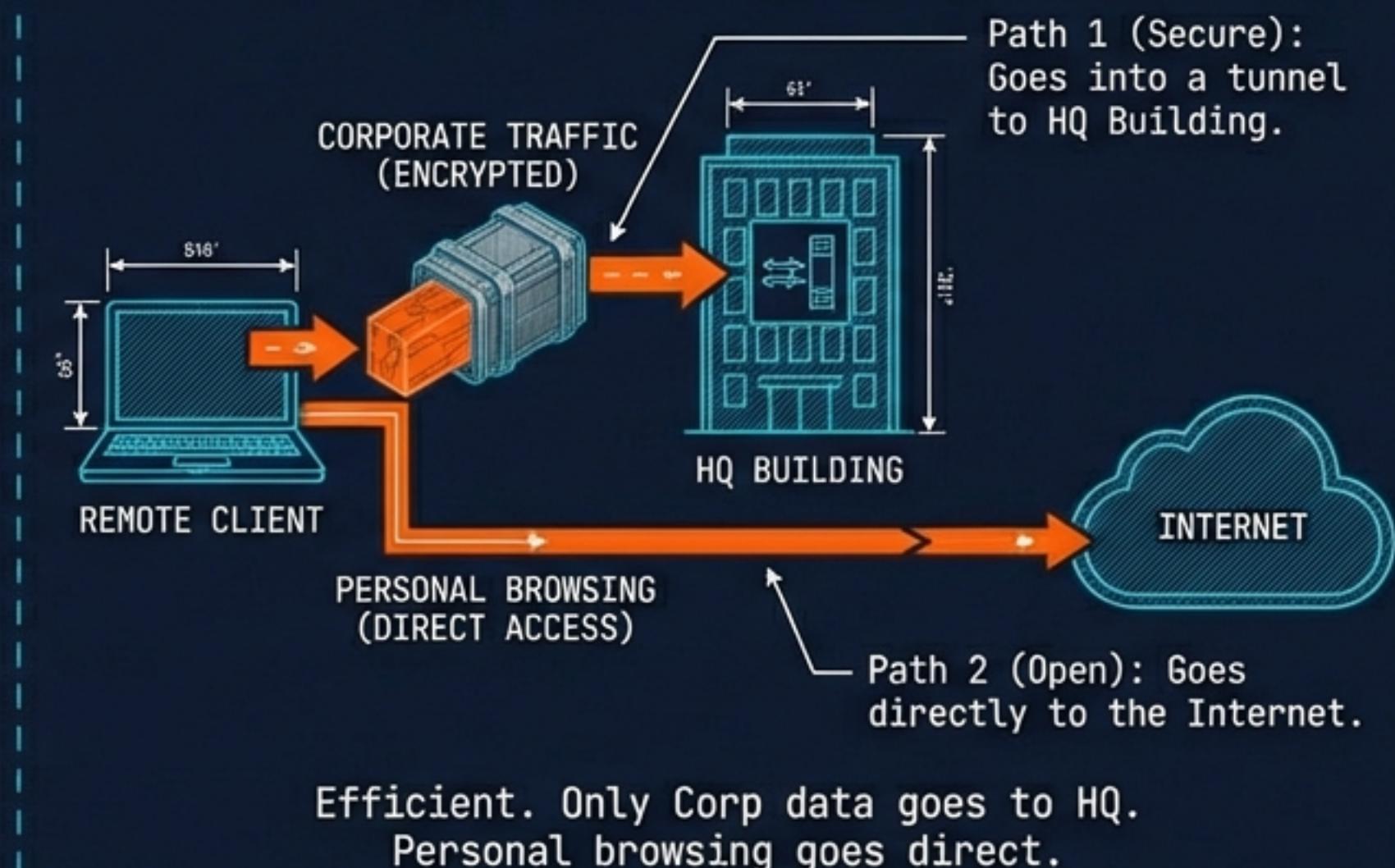


STEERING TRAFFIC: SPLIT VS. FULL TUNNEL

FULL TUNNEL



SPLIT TUNNEL



THE HARDWARE REALITY

UNMANAGED SWITCH

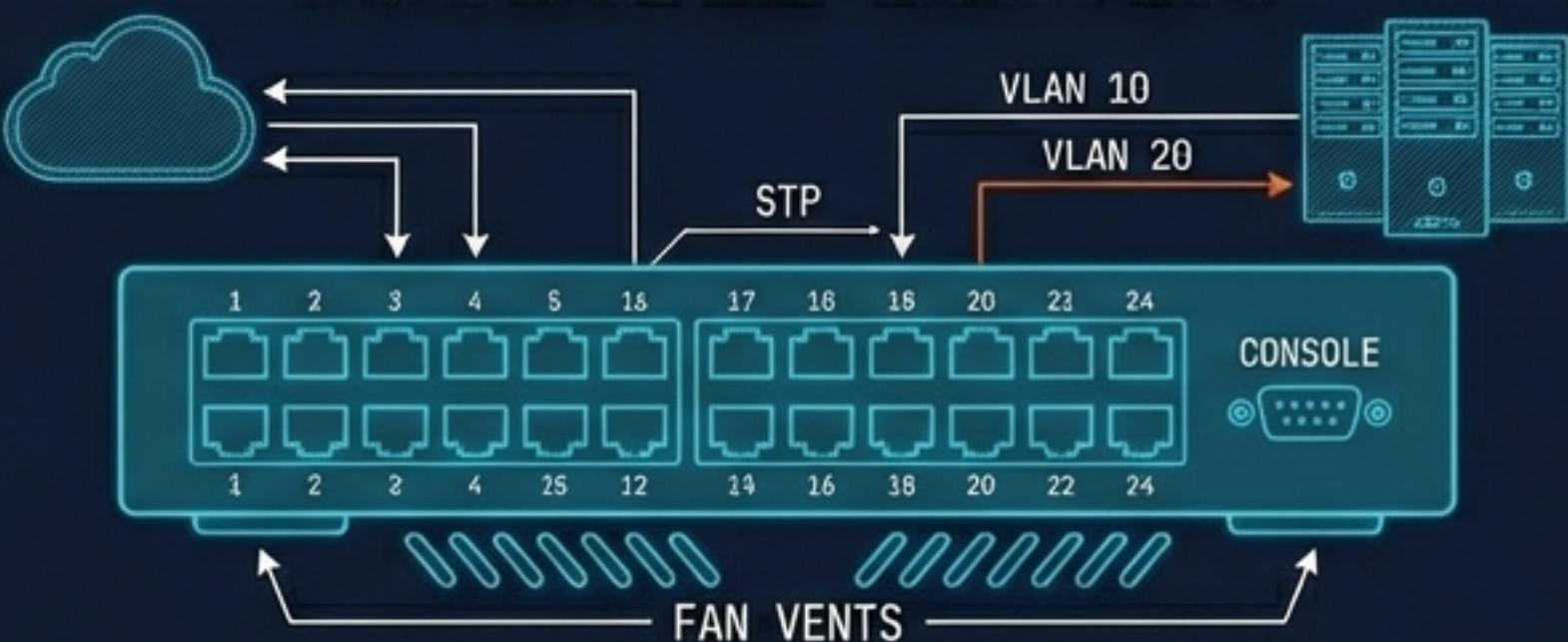


- Plug & Play
- No IP Address
- No VLANs
- Home Use

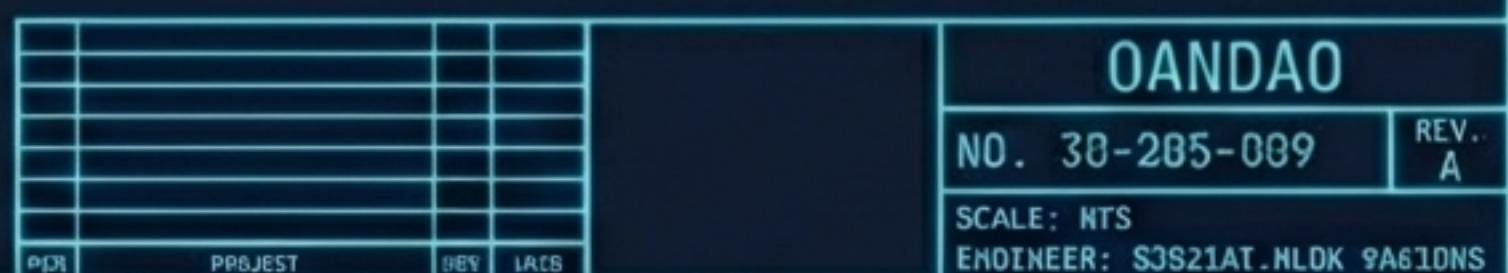
PoE (Power over Ethernet) Standards



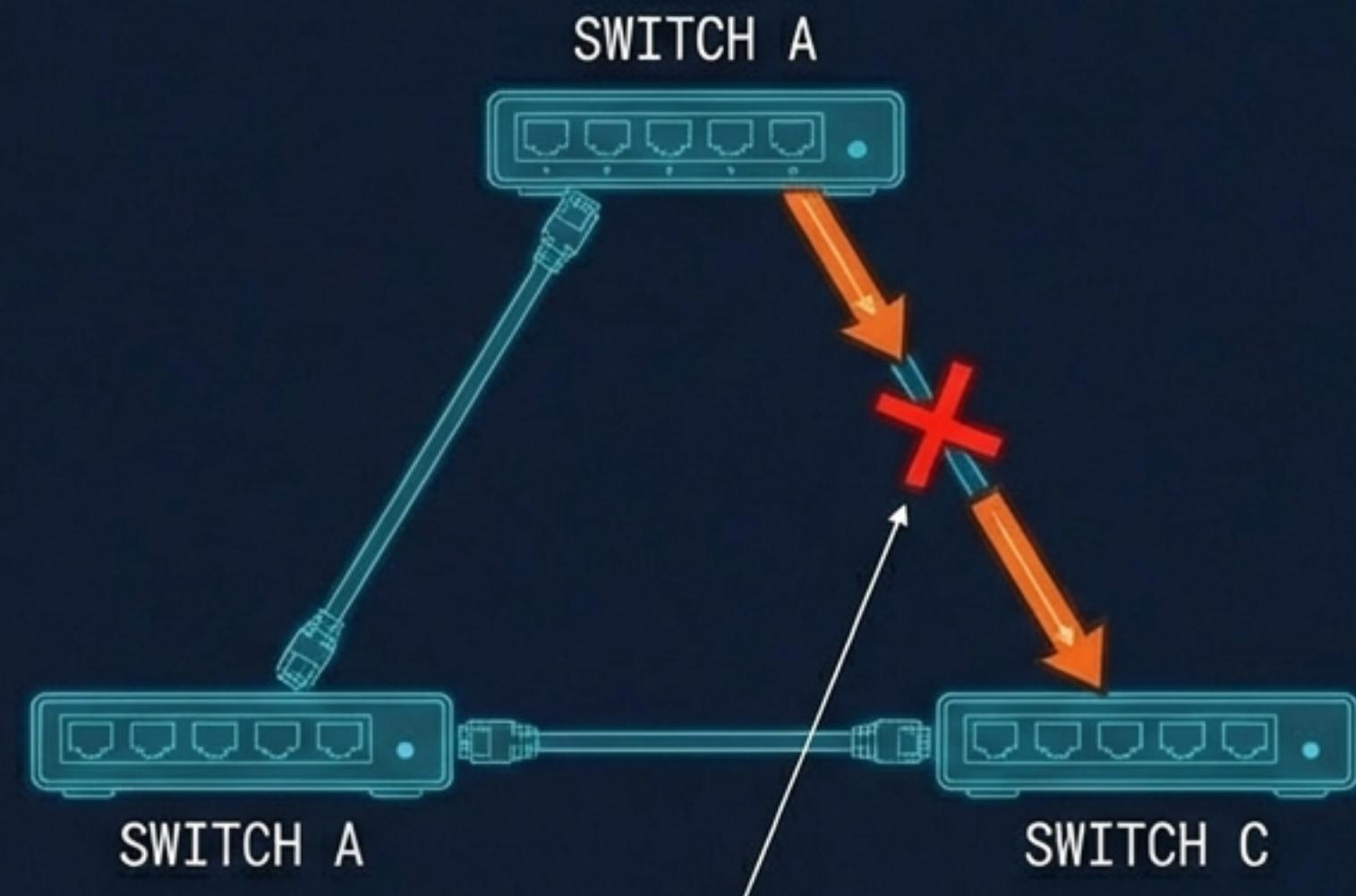
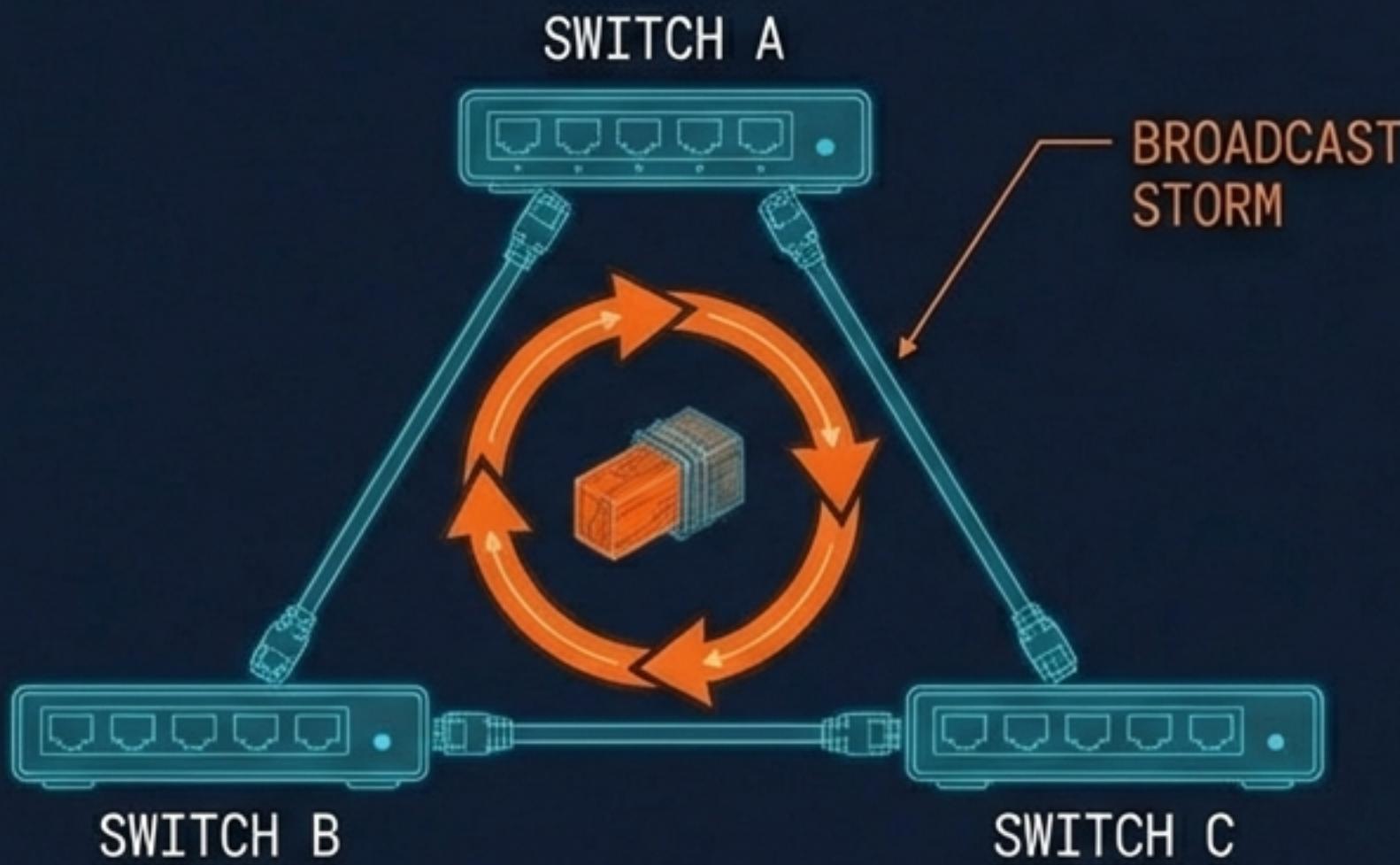
MANAGED SWITCH



- Configurable
- Supports VLANs/STP
- QoS Capable
- QoS Capable
- Netwoprice Use
- Enterprise Use



SAFETY SYSTEMS: PREVENTING THE INFINITE LOOP



STP (Spanning Tree Protocol) automatically blocks redundant paths to prevent loops.



OANDAO

NO. 30-205-010

REV.
A

SCALE: HTS
ENGINEER: SCS21AT.MLDK 9A610NS