Networking Basics · Pocket Guide

VLANs Made Easy

Trunk vs Access, tagged vs untagged

Access Port

- Faces a device
- Carries ONE VLAN
- Sends plain traffic
- No tag on the wire

Trunk Port

- Faces another switch
- Carries MANY VLANs
- Sends tagged traffic
- A label on each frame

One cable. Several separate networks. Here is how.

What is a VLAN?

A VLAN splits one physical network into several separate ones. The cables do not change – only the rules about who may talk to whom.

Key Points:

- VLAN means Virtual Local Area Network
- Devices in different VLANs cannot see each other
- One cable can carry many VLANs at once
- Each VLAN has an ID number from 1 to 4094
- It needs a managed switch – not an unmanaged one

Think of one building divided into separate floors.

Why bother?

On a flat network every device can reach every other device. That means the least protected thing you own sets the security level for everything else.

What VLANs give you:

1. Cameras and IoT kept away from your files
2. Guest WiFi that cannot reach the office
3. Less broadcast noise on every device
4. Problems contained to one segment
5. Rules you can actually write and audit

A guest in the lobby should not have a key to every room.

The Access Port

The port a device plugs into

Key Points:

- Belongs to exactly ONE VLAN
- Faces a laptop, camera, printer or phone
- Traffic leaves it UNTAGGED – plain and normal
- The device has no idea a VLAN exists
- Also called an untagged port

An access port is a door into one room only.

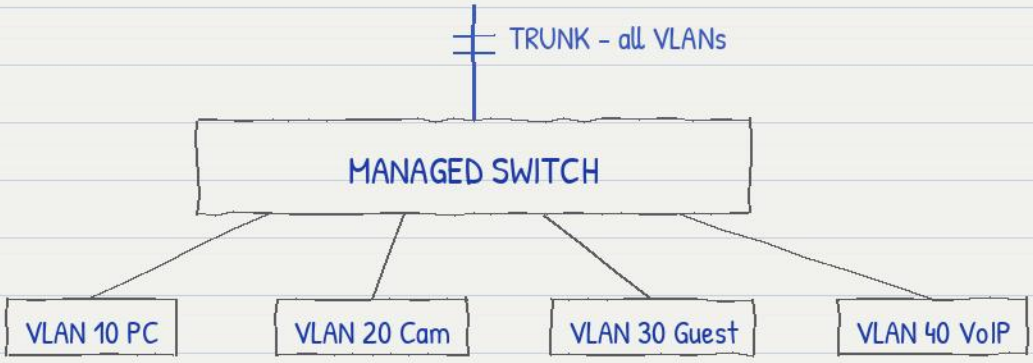
The Trunk Port

The port between switches

Key Points:

- Carries MANY VLANs down one cable
- Faces another switch, an access point or a firewall
- Traffic leaves it TAGGED so it stays sorted
- Both ends must agree on which VLANs are allowed
- Also called a tagged port

How it fits together



Access ports face devices. The trunk carries them all upstairs.

Tagged vs Untagged

The tag is added and removed for you

Laptop sends normal traffic | Switch adds VLAN tag | Next switch removes it

The tag is four extra bytes carrying the VLAN ID. It exists only between switches. No device ever sees it.

Untagged for devices. Tagged between switches.

Access vs Trunk

Feature	Access	Trunk
Faces	A device	A switch
VLANs	One	Many
On the wire	Untagged	Tagged
Device aware?	No	N/A
Typical use	Laptop, camera	Switch to switch
Other name	Untagged port	Tagged port
If misconfigured	Wrong network	Nothing works

Access faces people. Trunk faces equipment.

The Native VLAN

The one untagged lane on a trunk

A trunk may carry one VLAN without a tag. That is the native VLAN, and it is where most VLAN faults come from.

Remember:

- Both ends of the trunk must use the SAME native VLAN
- Mismatch it and two networks quietly merge
- The link still shows green – nothing looks broken
- Best practice: use a dedicated unused VLAN for it
- Never leave sensitive traffic on the native VLAN

A native VLAN mismatch looks fine and is not.

A Simple Analogy

Think of a post room

Access Port

- Hand a letter to one office
- No label needed
- They only get their own post
- Simple and direct

Trunk Port

- A sack for the whole building
- Every letter gets a label
- Sorted at the far end
- One trip, many offices

- The label only exists while the post is in transit.

A Typical Plan

What most homes and small offices end up with

Common VLANs:

- VLAN 10 – Work laptops and the NAS
- VLAN 20 – Cameras and the NVR
- VLAN 30 – Guest WiFi, internet only
- VLAN 40 – Phones and VoIP
- VLAN 99 – Management, for the switches themselves

Start with three. Add more only when you need them.

Mistakes We See

1. An unmanaged switch in the middle of a trunk - some pass tags, some mangle them, none tell you which
2. Forgetting the management VLAN and locking yourself out of the switch
3. Native VLAN mismatch, which merges two networks silently
4. Forgetting the access point needs a trunk to serve several SSIDs
5. Assuming VLANs alone are security - the firewall still writes the rules

Plan the way back in before you segment anything.

Quick Revision

VLAN means Virtual Local Area Network
It splits one network into several
Access port = ONE VLAN, faces a device
Trunk port = MANY VLANs, faces a switch
Access traffic is untagged
Trunk traffic is tagged
The tag is 4 bytes carrying the VLAN ID
Devices never see the tag
VLAN IDs run from 1 to 4094
Native VLAN is the untagged lane on a trunk
Both trunk ends must match
You need a managed switch

Untagged for devices. Tagged between switches.

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