■ Lab 1 Troubleshooting Guide: Static Routing Foundations

This guide is your safety net. If your lab breaks, do not restart or rebuild. Every issue you encounter is a clue about how routing really works in layered networks.

1■■ Point-to-Point (/30) Links – Most Common Failure

- Using a network or broadcast address on a routed link
- Assigning the same IP to both sides of the point-to-point connection
- Forgetting to use the /30 subnet mask
- Assuming /24 behavior applies to WAN links
- **Reality check:** Interfaces may show up/up but routing will silently fail.

■ Verify with **show ip interface brief**
Each side must be in the same /30 network and use different usable host IPs.

2■■ Layer-3 Switch Interfaces Still Acting Like Layer 2

- Forgetting that switches default to Layer 2 mode
- Configuring an IP address but never issuing **no switchport**
- Assuming assigning an IP automatically enables routing
- **Routing cannot happen on a Layer-2 interface.**

3■■ Missing or Incorrect Default Routes

- Distribution switches do not know where "everything else" lives
- Default routes are required to forward traffic upstream
- Using the wrong next-hop IP address
- Pointing the default route at the local SVI instead of the core

4■■ Static Routes Are One-Way Knowledge

- Routes do not automatically work in both directions
- Every device must know how to reach a network AND return traffic
- Students often configure routes on only one side
- **Ping works one way = missing return path.**

5■■ VLAN Gateway (SVI) Configuration Errors

- Incorrect VLAN ID

- VLAN interface left administratively down

- Wrong IP address used for the gateway

- PC default gateway does not match SVI

6■■ End Device Default Gateway Mistakes

- Wrong gateway IP address

- Gateway in the wrong subnet

- Typos and copy-paste errors across PCs

- **If the gateway is wrong, nothing else matters.**

7■■ Configuration Not Saved

- Packet Tracer does not auto-save device configurations

- Closing the file without saving wipes progress

- Always run **copy running-config startup-config**

8■■ Misreading the Routing Table

- Seeing a physical link and assuming routing exists

- Ignoring route codes (C, S, S*)

- Not checking next-hop information

- **No route in the table = no path.**

■ Recommended Troubleshooting Order:
1. Ping your gateway
2. Check VLAN SVI status
3. Verify default routes
4. Confirm static routes
5. Validate /30 addressing
6. Use traceroute to find the break point

■ If you fix the problem without rebuilding the lab, you did it the right way.