# Troubleshooting Network Connectivity

**LPIC-2: Linux Engineer (201-450)**

### Objectives:

At the end of this episode, I will be able to:

1. Determine the location of a network failure from the Linux CLI.
2. Utilize ss, tcpdump, and nc to perform advanced network troubleshooting.

> Additional resources used during the episode can be obtained using the download link on the overview episode.

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- Establish Scope
  - IPv4
    - `ping`
    - `traceroute`
      - `yum install traceroute`
    - `tracepath`
  - IPv6
    - `ping6`
    - `traceroute6`
      - `yum install traceroute`
    - `tracepath6`
- Verifying Settings
  - `ip`
    - Replacement for `ifconfig`
    - `ip addr`
      - Lists interface addresses
      - Netmasks and CIDR
    - `ip link`
      - Displays current link status
      - `ip -s link` provides statistics
    - `ip route`
      - Displays the routing table
- Reset Networking
  - `service network restart`
  - `systemctl restart network.service`
- Viewing Network Traffic
  - ss - Display network connections
    - `ss -atp` (All sessions)
    - `ss -tp` (Active sessions)

        - `ss --route` displays routing table
        - `ss --program` attempts to display software using ports
    - Packet Capture
        - `tcpdump`
        - Displays packets passing through an interface
        - `tcpdump -i eth0 > data.txt`
        - `tail -f ./data.txt`
- Simulating a connection
    - netcat
        - `nc`
        - Tests connections to hosts
        - `nc itpro.tv 80`
        - `GET`
        - `netstat -an | grep itpro.tv`