🔧 SRE Guide: Troubleshooting in Linux

🔥 High CPU Usage Debugging

📌 Identify Processes Consuming High CPU

```
top -o %CPU  # Sort processes by CPU usage
```

📌 Monitor CPU Utilization Over Time

```
pidstat -u 1 5  # Collect CPU usage every second for 5 iterations
```

💾 Debugging High Disk I/O Wait

📌 Check I/O Wait %

```
iostat -c 1 5  # Monitor CPU I/O wait over time
```

📌 Identify Slow Disks

```
iostat -dx 1 5  # Check disk activity and performance metrics
```

📌 Identify High Disk Usage by Processes

```
pidstat -d 1 5  # Monitor disk usage per process
iotop
```

📌 Find Large Files Consuming Disk Space

```
du -ah / | sort -rh | head -20  # Find top 20 largest files
df -h  # Check disk usage by partitions
```

3.Network Connectivity & Firewall Checks

✅ Basic Connectivity Checks

```
ping -c 5 google.com        # Test if an external host is reachable
traceroute google.com       # Trace network path to the destination
mtr google.com              # Real-time packet loss & latency analysis
```

Check IP Address & Routing

```
ip a        # Show IP addresses (alternative to ifconfig)
ip r        # Show routing table
hostname -I # Get current IP address
```

🔹 **Example Scenario:**

If **Nginx is not responding on port 80**, check if the process is running and listening:

netstat -tulnp # Show listening ports & processes

ss -tulnp # Faster alternative to netstat

🌐 **Network Latency & Packet Loss Debugging**

 Identify network bottlenecks between microservices.

 Verify DNS resolution delays affecting API response times.

📌 **Measuring DNS Latency Issues**

time dig google.com # Measure DNS resolution time
time nslookup google.com
time host google.com

📌 **Simulate Network Latency (200ms) on VM2**

On **VM2**, introduce network latency:

sudo tc qdisc add dev ens4 root netem delay 200ms

On **VM1**, test the latency:

ping -c 5 10.128.0.62

traceroute 10.128.0.62

📌 **Simulate Packet Loss (10%)**

On **VM2**, introduce packet loss:

sudo tc qdisc change dev ens4 root netem loss 10%

📌 On **VM1**, test the impact:

ping -c 5 10.128.0.62

mtr 10.128.0.62 # Real-time packet loss monitoring

Find Established Connections & Network Issues

Find active network connections:

netstat -ant | grep ESTABLISHED # Show active TCP connections

netstat -tulnp | grep :80 # Check if port 80 is open and listening

ss -tuln # Display TCP and UDP listening ports