IT PROJECT
DOCUMENTATION

Network Troubleshooting
DNS Resolution & Capture Analysis

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Google IT Support
Professional Certificate

Ubuntu, Terminal

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I. Project Overview

This project was part of my self-training during the Google IT Support Specialist Certificate.
The objective was to simulate a common DNS resolution issue, capture the traffic using Wireshark, and diagnose the issue by analyzing the relevant packets and protocols.

II. Environment Setup

Component	Details
OS	Ubuntu 22.04 (on Virtualbox)
Network Type	NAT, Bridged. Home Wi-fi
Tools	Wireshark
DNS settings	DNS IPs invalid (1.2.3.4, 5.6.7.8)

III. Problem Simulation

I intentionally modified the VM's IPv4 settings to use non-operational DNS Servers (1.2.3.4, 5.6.7.8). Due to this change it caused name resolution to fail, which allowed me to observe how such issues appear in packet captures with Wireshark and in the end, revert it back to the normal.

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4. Packet Capture and Analysis

Wireshark filter used :
- 'dns'

Key Findings :
- The VM sent multiple DNS Queries, which failed to get any response.
- State on the screen : "Response missing".
- The network traffic clearly shows repeated DNS requests failing to resolve.

V/ Resolution

To resolve the issue, I replaced the invalid DNS IPs with 8.8.8.8 (Google Public DNS). After restarting the network service, DNS resolution operated correctly like before, confirmed by new successful DNS response in Wireshark on 8.8.8.8 and the successful loading of websites in Firefox.

VI/ Key Takeaways & Skills Demonstrated

1. Hands-on network troubleshooting using Wireshark.
2. Application layer and protocol analysis (DNS over UDP).
3. Simulation and diagnosis of a real-world-issue.
4. Understanding of DNS behavior and network configuration impact.

VII/ Screenshots & Visuals

📎 View full gallery and descriptions on GitHub:
https://github.com/morganburera/dns-wireshark
project/blob/main/screenshots.md

VIII/ Optional Enhancements, Reflection

Ideas for improvement, or reflection on what was learned and what could be added.

Video Recording Link

https://youtu.be/8YRIG__Khgc