SECURE DNS OVER TLS VS DNSSEC

COURSE: Computers NETWORK

COURSE CODE:CSA0735

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ABSTRACT

- The Domain Name System (DNS) remains a fundamental yet vulnerable component of internet infrastructure. Traditional DNS queries are sent in plaintext, exposing users to surveillance, spoofing, and manipulation.

- DNS over TLS encrypts DNS queries and responses between clients and resolvers, protecting against eavesdropping and man-in-the-middle ATTACKS

- However, DNSSEC does not encrypt DNS traffic and thus does not protect against surveillance or traffic analysis

INTRODUCTION

- **DNS over TLS (DoT)** is a security protocol that encrypts DNS queries and responses between a user's device and the DNS resolver using **Transport Layer Security (TLS)**. This prevents eavesdropping and man-in-the-middle attacks on DNS traffic.

MODULE 1:INTRODUCTION TO DNS & ITS VULNERABIBILITIES

- Translates domain names (like example.com) into IP addresses (like 192.0.2.1).
- Acts as the "phonebook of the internet."
- Essential for accessing websites, email services, and other online resources.
- Operates using a **hierarchical and distributed** architecture.
- Common DNS record types: **A, AAAA, CNAME, MX, NS, TXT**.
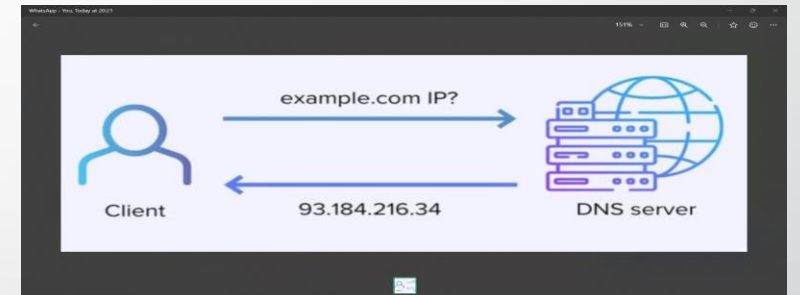
MODULE 2:UNDERSTANDING DNSSEC

- **DNSSEC adds security** to the Domain Name System (DNS) by enabling authentication of DNS data.

- It **prevents attackers from spoofing** DNS responses (e.g., DNS cache poisoning).

MODULE3:CONCLUSION & RECOMMENDATIONS

- Do **not run open DNS resolvers** unless absolutely necessary.

- Open resolvers can be exploited for DNS amplification attacks.

- Keep records (A, AAAA, MX, CNAME, etc.) up to date
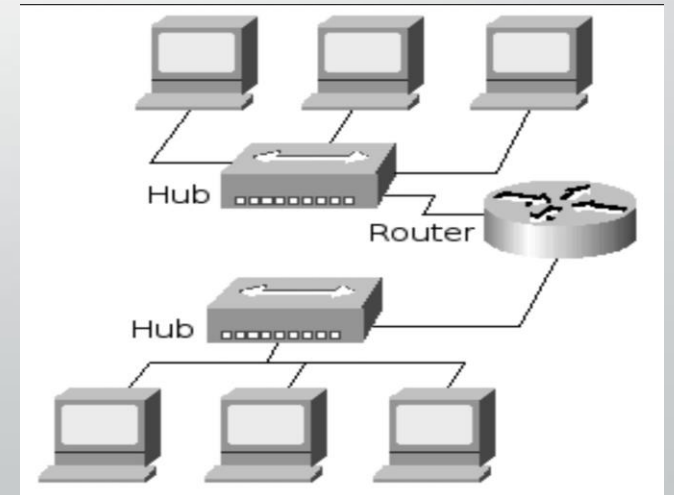
CONCLUSION

Misconfigured VPNs or DNS settings.
- Operating system defaults to using local DNS servers instead of VPN-provided ones
- It simplifies user access to websites and services by allowing the use of memorable domain
- names instead   of complex numerical IP addresses..
- DNS is structured in a hierarchical and distributed manner, ensuring scalability, reliability, and efficient management of domain names worldwide.

THANK YOU