

# DNS

## INTRODUCTION

DNS: The Domain Name System (DNS) is a fundamental component of the internet's infrastructure, acting as the directory service that translates human-readable domain names into machine-readable IP addresses. This system enables users to access websites using familiar names like `www.example.com` instead of complex numerical addresses like `192.0.2.1`.

By understanding DNS, we gain insight into how internet connectivity is maintained and how various entities manage and control domain names.

This report primarily show how I answered the questions.

What does DNS stand for?

Domain Name System

✓ Correct Answer

From the tryhackme dns room, DNS stands for Domain Name System.

## DNS Hierarchy

The DNS operates on a hierarchical structure, ensuring an efficient and organized resolution process. Understanding this hierarchy is crucial for grasping how internet communication and navigation are seamlessly maintained.

### Structure of DNS Hierarchy

#### 1. Root Level

- The topmost level of the DNS hierarchy consists of the root servers, which hold the root zone file containing pointers to the authoritative servers for all top-level domains (TLDs). There are 13 root server clusters, labeled A through M, strategically distributed worldwide to provide redundancy and high availability.

#### • Top-Level Domains (TLDs)

◇ Below the root level are the TLDs, which include generic top-level domains (gTLDs) like `.com`, `.org`, and `.net`, as well as country code top-level domains (ccTLDs) like `.uk`, `.jp`, and `.de`. Each TLD is managed by a registry, responsible for maintaining the DNS records for domains within that TLD.

#### • Second-Level Domains

◇ Second-level domains are directly below TLDs and typically represent specific organizations, businesses, or individuals.

#### • Subdomains

◇ Subdomains extend the DNS hierarchy further. They are subsets of second-level domains and can be used to organize different sections of a website or service. For instance, in `mail.example.com`, "mail" is a subdomain of the second-level domain "example.com."

What is the maximum length of a subdomain?

63

✓ Correct Answer

Which of the following characters cannot be used in a subdomain (3 b \_ -)?

\_

✓ Correct Answer

Alphabets a-z, numbers 0-9 and hyphens are the only characters that are allowed in subdomains, therefore the “\_” character is not allowed.

What is the maximum length of a domain name?

253

✓ Correct Answer

The max length of a domain name should not exceed 253

What type of TLD is .co.uk?

ccTLD

✓ Correct Answer

There are two types of TLD, gTLD (Generic Top Level) and ccTLD (Country Code Top Level Domain). ccTLD was used for geographical purposes, to show which region the site is based. So .co.uk is a ccTLD for it tells its a commercial site based in UK.

What type of record would be used to advise where to send email?

MX

✓ Correct Answer

What type of record handles IPv6 addresses?

AAAA

✓ Correct Answer

A handles IPv4 records  
AAAA handles IPv6 records

What field specifies how long a DNS record should be cached for?

TTL

✓ Correct Answer

TTL which stands for time to live specifies how long a DNS record should be cached.

What type of DNS Server is usually provided by your ISP?

recursive

✓ Correct Answer

What type of server holds all the records for a domain?

authoritative

✓ Correct Answer

What is the CNAME of shop.website.thm?

shops.myshopify.com

✓ Correct Answer

```
user@thm:~$ nslookup --type=CNAME shop.website.thm
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
shop.website.thm canonical name = shops.myshopify.com
```

What is the value of the TXT record of website.thm?

THM{7012BBA60997F35A9516C2E16D2944FF}

✓ Correct Answer

```
user@thm:~$ nslookup --type=TXT website.thm
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
website.thm text = "THM{7012BBA60997F35A9516C2E16D2944FF}"
```

What is the numerical priority value for the MX record?

30

✓ Correct Answer

```
user@thm:~$ nslookup --type=MX website.thm
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
website.thm mail exchanger = 30 alt4.aspmx.l.google.com
```

What is the IP address for the A record of www.website.thm?

10.10.10.10

✓ Correct Answer

```
user@thm:~$ nslookup --type=A www.website.thm
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
Name: www.website.thm
Address: 10.10.10.10

user@thm:~$ nslookup website.thm
```



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## CONCLUSION:

In conclusion, the Domain Name System (DNS) is an indispensable component of the internet's architecture, enabling seamless connectivity and accessibility. Its hierarchical structure, encompassing root servers, top-level domains, second-level domains, subdomains, and hostnames, ensures an organized and efficient resolution of domain names to IP addresses. This hierarchy not only facilitates the easy navigation of the internet for users but also maintains the stability and robustness of the global network.

Understanding the intricacies of DNS, including its resolution process and the roles of various DNS servers, underscores the importance of this system in our daily digital interactions.