# Assignment 1

**Exercise 1 – Domain Name Service, URIs, Protocols**

Explain the idea of DNS record types and the difference between A, MX, NS, and TXT

records. Use nslookup command line tool to find out the following information:

a) The IP address of the server with the domain name www.ages.at. Additionally, find

out how long your currently cached version of the corresponding record with this

information is still valid and which DNS server is responsible for this zone.

b) Explain all components of following URI:

https://john:jPW@www.example.com:443/forum/posts/?topic=webtec&order=

latest#top

**What are DNS record types?**

DNS record types are records that provide important information about a hostname or domain. These records include the current IP address for a domain.

Also, DNS records are stored in text files (zone files) on the authoritative DNS server. The content of a DNS record file is a string with special commands that the DNS server understands.

* **A record (IP4 lookup)**

The A record is the most important DNS record type. The "A" in A record stands for "address." An A record shows the IP address for a specific hostname or domain. For example, a DNS record lookup for the domain example.com returns the following result:

**Use of a record**

**The main use of A record is for IP address lookup**. Using an A record, a web browser can load a website using the domain name. As a result, we can access websites on the internet without knowing their IP addresses.

Another use of A record is in the domain name system-based blackhole list (DNSBL). Here, the A record is used to block mail from known spam sources.

* **MX record (Mail exchange)**

A mail exchange (MX) record is a DNS record type that shows where emails for a domain should be routed to. In other words, an MX record makes it possible to direct emails to a mail server.

You can have multiple MX records for a single domain name. And what this means is that you can have backup email servers. The following shows an example of a domain with multiple MX records:

* **NS record (Nameserver)**

A nameserver (NS) record specifies the authoritative DNS server for a domain. In other words, the NS record helps point to where internet applications like a web browser can find the IP address for a domain name. Usually, multiple nameservers are specified for a domain. For example, these could look like ns1.examplehostingprovider.com and ns2.examplehostingprovider.com.

Use of NS record

If you've purchased a web hosting service or set up a simple website, you probably received an email with nameserver details. Those nameservers, in simple terms, connect your domain name to the actual server your site is hosted on. The nameserver contains other DNS records for the domain like an A record and MX record.

* **TXT record**

TXT stands for "text," and this record type lets the owner of a domain store text values in the DNS. Several services use this record to verify ownership of a domain.

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b)

<https://john:jPW@www.example.com:443/forum/posts/?topic=webtec&order=latest#top>

Scheme // authority (domain name): port 443 / path / query / fragment

**Exercise 2 – HTTP Requests**

a) Use the Developer Tools of your web browser (e.g., Chrome) to inspect the HTTP

requests when opening the website of www.orf.at and answer the following

questions:

o How many requests are sent, how much data is transferred, and how long

does it take to load the site from the server?

o What is the response status code of the first request?

o What type of web server is serving this website?

o What types of resources are requested?

o Which request is the slowest?

b) Repeat the procedure and answer the same questions for www.kaernten.at

c) Open up www.google.at, clear the content of the network inspection window and

enter the word “Klagenfurt” into the search field. While entering the word look at

the network requests and explain what happens.

# **Exercise 3 – Setting up Apache**

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