CN 2018 Problem Sheet #5

Problem 5.1: *domain name system*   (1+1+1+2+1+2 = 8 points)

a) Explain in your own words the difference between recursive and iterative DNS queries.

b) Explain how the fully qualified domain name `grader.eecs.jacobs-university.de.` is resolved to an IPv6 address. Provide a trace (using `dig`) of the name resolution process.

c) Is it possible to resolve a name to both an IPv4 address and an IPv6 address using a single DNS query message? Explain why or why not.

d) The `SRV` resource record was introduced in the mid 1990s. What exactly is the format and the function of the `SRV` resource record and where is it defined? Provide an example for a `SRV` resource record. What is the difference between priority and weight and how are these fields used together?

e) Does it make sense to use the `SRV` resource record for HTTP? Provide arguments in favor of using `SRV` resource records for HTTP and arguments against using `SRV` resource records for HTTP.

f) Read about EDNS0. Which problem is EDNS0 solving and where is EDNS0 defined? What is the meaning of the CLASS field and the TTL field in an OPT resource record?

Problem 5.2: *multicast DNS (mDNS) and DNS Service Discovery (DNS-SD)*   (1+1 = 2 points)

a) What is multicast DNS (mDNS) and where is it defined? How does mDNS depart from regular DNS protocol semantics?

b) What is DNS-based service discovery (DNS-SD) and where is it defined? Provide an overview how different DNS records are used to provide service discovery functionality.