COMP3331/9331 Computer Networks and Applications

Assignment Mark Request for Term 2, 2023

Language:	Python 3
Basic Version	
Limitations/Issues	**Possible Solutions**
1. When parsing domain names, domain names are automatically split by ‘.’ to attain domain name labels. As a result, correct formatting within responses is slightly deviated from the expected outcome, with each found nameserver to no trail with 1 ‘.’ 2. When reading bytes of other encoded domain servers or name servers, readName function is limited by data of bytes containing hexadecimal notated bytes, e.g. b‘\xc9’, which produces a UniDecodeError when attempting to utilise .decode() the inputted bytes. 3. If encountered a CNAME result from an A type query, the resolver ends its resolution process in only returning CNAME RR. Resolver results in an infinite loop query loop in questioning previous domain names, leading to timeout failure.	1. Implement string operations when parsing the answer response to the client. Applying these operations to nameservers before being sent back to client can solve this limitation. 2. Create a function that parses through every byte within a given section of data containing bytes, determine whether the parsed byte is hexadecimal to use .encode() by implementing try and except to capture UniDecodeError. If caught error, use to_bytes function to convert hexadecimal notated byte to decode given byte. 3. When resulting in a CNAME and if it has authoritative name servers, change current target domain name to be the canonical name of the CNAME RR for successive queries to find, which allows for other authoritative names to be searched and find the type A response.

Enhancement 1:	Error handling
Limitations/Issues	**Possible Solutions**
1. Incorrect name format is identified as a code 3 name error. This can lead to confusion as incorrect formatting of a domain name would refer to another type of arbitrary error, such as ‘incorrect format inputted’. 2.	1. Utilise exceptions to pick up errors other than code 1, 2, 3 and others. For example, catching SystemExit exceptions to capture a helper function leave indicating occurred error, specifying the exact error of the function leave. 2.

Enhancement 2:	Advanced Records and Reverse DNS

Limitations/Issues	Possible Solutions
1. Interface allows for command line input of advanced records, however CNAME, PTR and MX records are unsuccessful requests, with resolver unable to process these 3 types.	1. Similar to basic version limitation, when encountered with a CNAME resource record, allocate the SNAME to be the canonical name of the CNAME resource record for it to be queried again from the root, and iteratively find successive authoritative name servers till reached CNAME.

COMP3331/9331 Computer Networks and Applications

Assignment Mark Request for Term 2, 2023

Enhancement 3:	Client Multiplexing

Limitations/Issues	**Possible Solutions**
1. Applied threading module to accept multiple client DNS queries, however, no data structure utilised as per spec.	1.