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BSIT 4-4

1. The Domain Name System (DNS) is a critical component of the internet infrastructure. Explain how DNS functions as a decentralized and distributed database to translate human-readable domain names into numerical IP addresses. Discuss the significance of this translation process in enabling seamless internet communication and user-friendly access to online resources. Analyze the role of recursive DNS resolvers and authoritative DNS servers in the DNS resolution process, and evaluate the benefits of iterative querying in locating the correct IP address associated with a requested domain name. Consider the impact of DNS on internet usability, scalability, and reliability, and discuss potential challenges and solutions in managing DNS configurations in large-scale network environments.

* Domain Name System acts as the internet's phonebook, translating easy-to-remember domain names like www.facebook.com into the numerical IP addresses, such as 192.0.2.1, that computers use to find each other. Instead of being one giant, central database, DNS is a decentralized and distributed system, meaning the information is spread across millions of servers all over the world. This design prevents a single point of failure and makes the internet robust and scalable.