How DNS works?

In the world of networking, computers do not represent by names like humans do, they represent by numbers because that is how computers and other similar devices talk and identify with each other over a network, which is by using numbers such as IP addresses.

Humans on the other hand are accustomed to using names instead of numbers, whether is talking directly to another person or identifying a country, place, or things, humans identify with names instead of numbers.

So, in order to bridge the communication gap between computers and humans and make the communication of a lot easier networking engineers developed DNS.

DNS resolves Domain name to IP ADDRESS.

DNS Server: A DNS server is a piece of software that keeps track of domain names and IP addresses. It answers with the appropriate IP address to requests from DNS resolvers.

E.g.: While browsing if we want to go to certain website, we type the name of that website and the DNS will convert that name into IP address.

The DNS server will search through its database to find the matching IP address for that website name we entered.

DNS is just like a phone book: If we want to call someone, we look for tha name of that person and then find the number of that person and call them.

Process of DNS in detail:

1. Suppose we search for yahoo.com, first the OS will try to find the IP address of yahoo.com in its own cache memory. If it can’t find the IP address it will send the query to the next level i.e., resolver server. Resolver server is own Internet service provider.
2. When the resolver receives the query it will check its own cache memory for the IP Address, if found it will send the IP address back to us. If it can’t find the IP Address in its cache it will send a query to next level i.e., Root server. There are 13 sets of root server all across the world.
3. When the root server receives the query, the root server doesn’t know the IP address, but it knows where to send the resolver server to help find the IP Address. So the root server will direct the resolver to the TLD (Top Level Domain).
4. Now the resolver will ask the TLD for the IP address of Yahoo.com. TLD stores the address information for a top-level domain. Such as .com, .net, .org.
5. So, when the TLD receives the query for IP Address of yahoo.com. If the TLD don’t know the IP Address of yahoo.com. It will redirect the resolver to the final level which are the Authoritative Name server.
6. Now the resolver will ask the authoritative name server for the IP address of yahoo.com.
7. The Authoritative Name server are responsible for knowing about everything about domain. Which includes IP address. The Authoritative Name server will response with the IP Address of yahoo.com.
8. And finally, the resolver will tell us the IP address of yahoo.com. And now our computer can retrieve the yahoo web page.
9. The resolver will now store the IP address of yahoo.com in its cache memory. So, if it receives another query for yahoo.com it can directly reply back the IP Address. And it won’t go through all the steps again.