FACT SHEET

WHAT IS THE DNS?

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When using the Internet, users access resources using names. For example, if you were to go to Netnod's website, you would go to www.netnod.se. However, the computers that make up the Internet know these resources instead by numeric addresses. They see www.netnod.se as either 192.71.80.109 or 2a01:3f0:1:3::109, depending on which version of the Internet protocol they're using. That name to number translation is done by the Domain Name System, or DNS.

The Domain Name System is a system without which the rest of the Internet doesn't work. Without the DNS, typing in www.netnod.se or any of the other names you use on a regular basis would get you nowhere.

Fortunately, the DNS is a reliable and resilient system, and generally just works. Failures are rare enough that most users have no reason to ever contemplate the DNS's existence.

What does it look like?
Ideally the DNS is completely transparent to users. You type in a name, and get taken to the resource identified by the name.

The numeric addresses used on the back end are hidden, and users don't need to know about them. Sometimes you have to configure your computer to talk to a DNS server. If your computer doesn't get its configuration information from the network automatically, it may ask you to specify a pair of DNS servers that are used for name lookups.

Sometimes you may see DNS errors, if you try to access something that doesn't exist, or if your or their DNS servers aren't working properly.

How does it work?
The Domain Name System infrastructure consists of two parts – a local recursive resolver, generally operated by your ISP or IT department, and authoritative servers, operated by or for domain owners.

The local recursive resolver is the server on your local network, where your computer sends DNS queries. When you point your web browser at www.netnod.se, your computer asks your local recursive resolver where to find www.netnod.se and the recursive resolver responds with the numeric IP address. The recursive resolver may already know the answer, if the same question has been asked recently, or it may need to go find the answer. To find the answer, it asks the authoritative servers. The authoritative servers are a group of servers operated by or for the owners of domains.

Since the DNS is a hierarchy, with domains containing other domains, a recursive resolver has to ask questions of a series of authoritative servers to find an answer. To find www.netnod.se, it starts at the root servers – the servers at the root of the DNS hierarchy, which have the list of top level domains and their authoritative name servers. The recursive resolver asks a root server where to find www.netnod.se,

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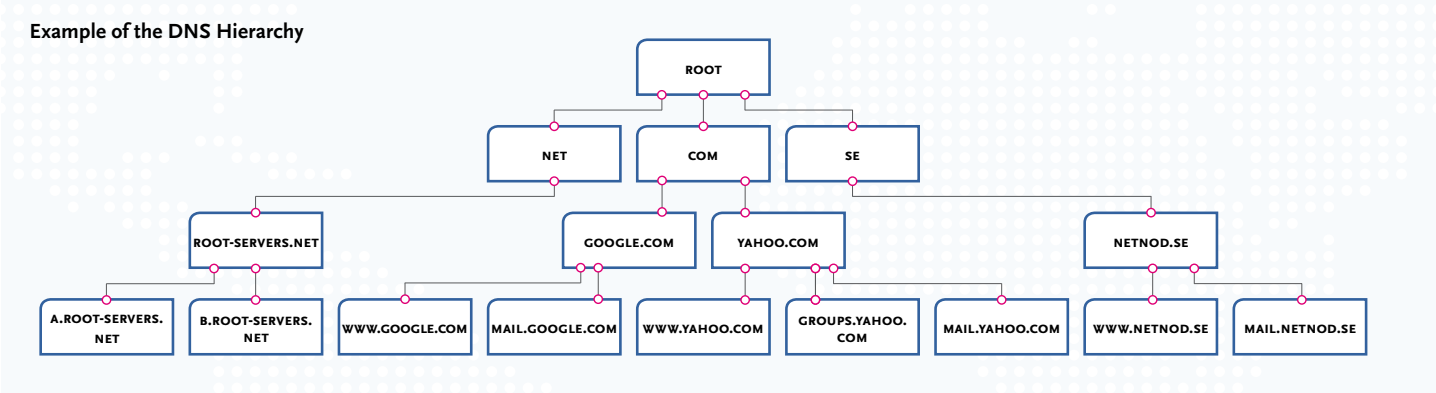

and receives a list of servers for .se. It then asks the .se servers where to find www.netnod.se, and gets a list of the authoritative servers for netnod.se. It asks the same question of the netnod.se servers, and finally gets the answer it was looking for – the address of www.netnod.se.

Who runs the authoritative servers?

The authoritative servers are owned and operated by many different organizations, and the servers are not necessarily owned by the organisations that operate the zones they serve.

The root zone – the list of top level domains – is managed by ICANN, the Internet Corporation for Assigned Names and Numbers. Some top level domain operators, such as Verisign with .COM and .NET, operate the authoritative servers for their zones. Others contract out their DNS, or run some of their own authoritative servers and contract out others. .SE, for instance, has its name servers operated by several organisations, including Netnod.

The name servers for companies' own domain names, and names below those in the hierarchy (netnod.se or www.netnod.se in this case) are often operated by the domain owner's ISP or hosting company, although some companies run their name servers themselves and some contract it out to dedicated DNS providers.