# DNS Namespace

For the free video please see
http://itfreetraining.com/dns/dns-namespace

This video looks at how the DNS name space is broken up and divided between servers. This allows the DNS name space to be controlled while still allowing individual administrator to have the power to make changes.

Fully Qualified Domain Name

- www.ITFreeTraining.com
- sales.example.com
- east.sales.example.com
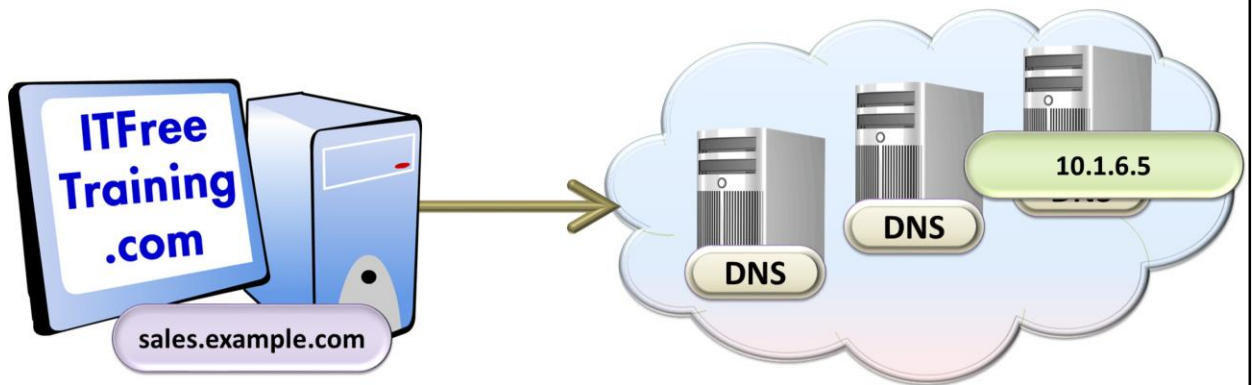
Fully Qualified Domain Name

A Fully Qualified Domain Name (FQDN) is a domain name that indicates a domain name's exact location in the DNS hierarchy. A FQDN in other words is the full domain name. For example, www.ITFreeTraining.com.

DNS uses a hierarchy of servers to resolve a single FQDN. Each DNS server resolves part of the domain name until the final DNS server is able to return a record for the FQDN.

Dividing up the DNS name space allows decentralized control, fault tolerance and load balancing.

DNS Name Space
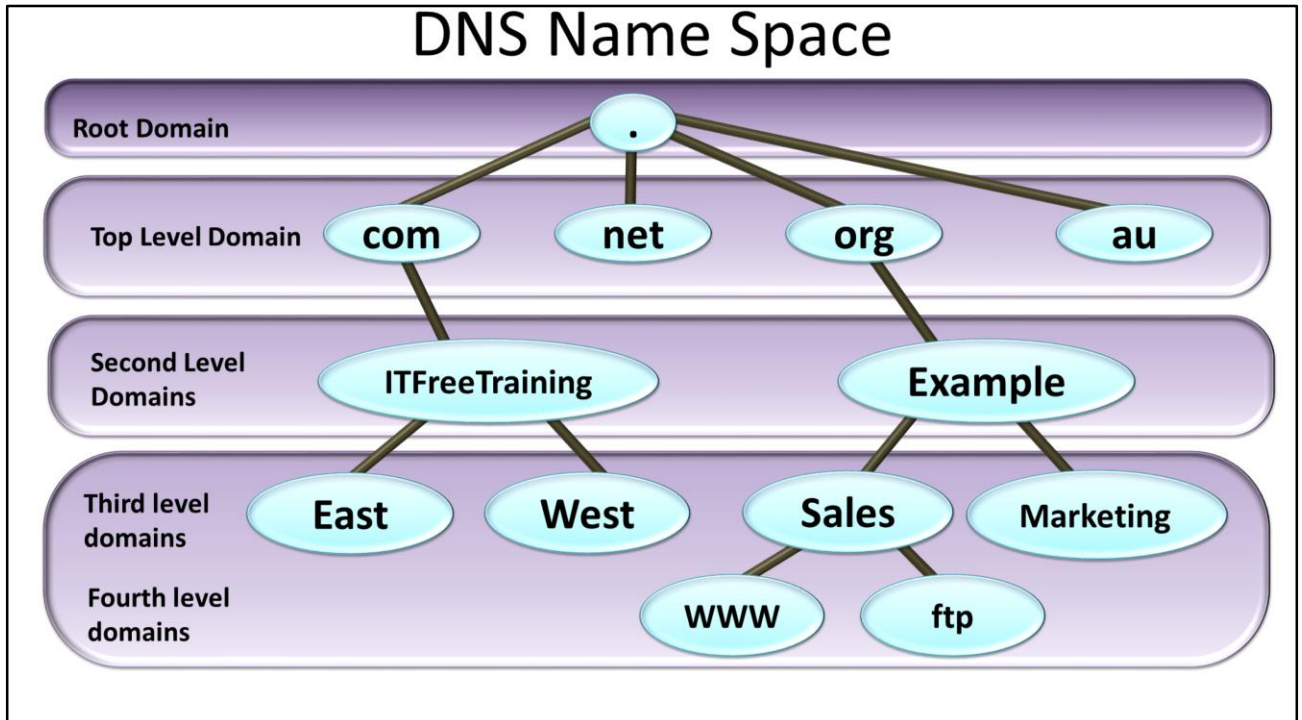
DNS Name Space

A DNS name is resolved from right to left. The first part of the DNS name is dot. All DNS names end in dot, however you do not need to enter this in as the DNS software will automatically add it to the end of the domain name. There are hundreds of DNS servers that are on the internet that can be used to start the resolving process starting with dot. The function of this DNS server, known as a root hint server, is to provide the address of a DNS server that can resolve the next part of the DNS name. The next part, top level domain, contains the name next part of the domain name. e.g. .com, .net, .au.

The next level is the second level domain name. These domains name can be registered to a company or individual. Once registered, the administrator has complete control over the domain name. They can create records at this level or additional sub domains under that domain. For example, third and fourth

Resolve Example
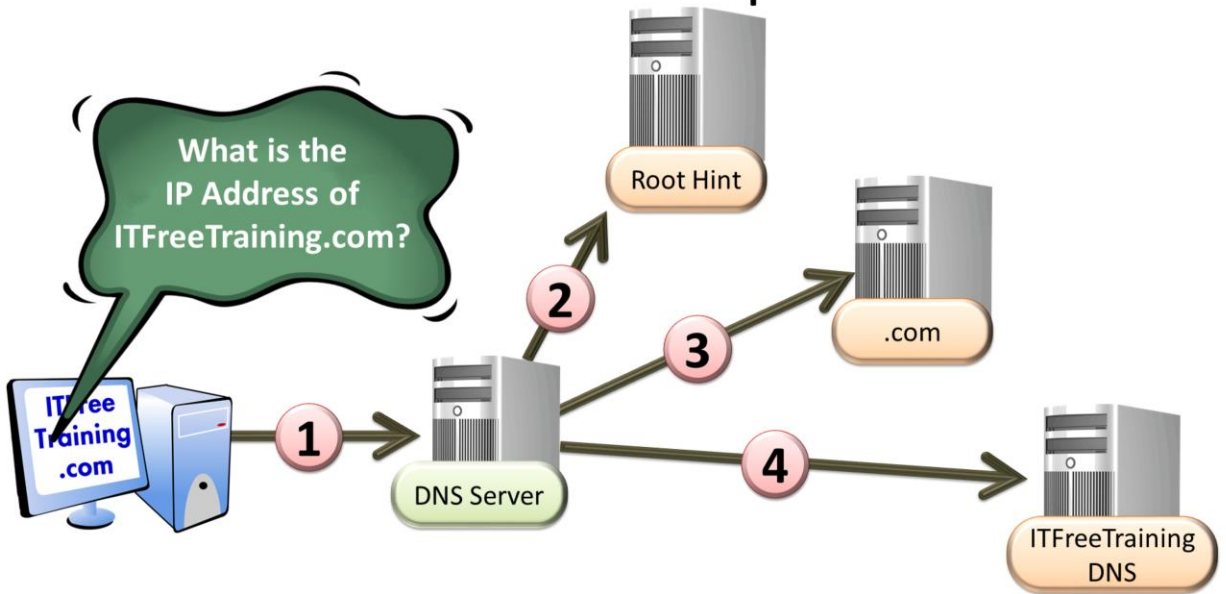
Resolve Example

1) When a DNS name is resolved, the request is first sent to the DNS server configured on the client. This DNS server is responsible for resolving the DNS name. A DNS server that contain source records for a DNS name is called authoritative. In other words, these records are configured directly by the administrator and are not cached. If a DNS server does not have the record required in its cache, it needs to find a DNS server that is an authoritative for that domain name.

2) In order to resolve the DNS name, the DNS server will contact a root hint server. These servers are preconfigured in the DNS server. The root hint server will provide a DNS server that will be able to resolve the name part of the DNS address. In the example, a .com DNS server.

3) The .com DNS server will be able to provide the client with an address of a DNS server then can resolved the next part of the address, in this case ITFreeTraining.

4) This DNS server holds the records for the ITFreeTraining zone. Thus, when a DNS server communicates with this server, it will be able to obtain DNS records for that zone.

Once the resolve process is complete, the address of each server resolved will remain in the DNS server's cache so the address of the .com DNS server does not need to be resolved each time. In the real world, the root hint server will often have top level domain names on them as well.

Configuring Root Hints

- Configured by default
  - Normally no need to change them
- In rare cases are disabled
- Most companies will forward DNS requests to their ISP

Configuring Root Hints
The DNS server will have the root hint servers configured by default. There will be multiple entries configured in case one or more of the root hint servers is not contactable. Normally there is no need to change them. In some rare cases, a company may choose to disable the root hints servers or use their own. This however is very rare.
In a lot of cases, a company will forward DNS requests to the DNS server run by their ISP. When this occurs, this effectively disables root hints from working since DNS requests are sent direct to the ISP DNS server rather than have the DNS server resolve the request itself.

See http://YouTube.com/ITFreeTraining or http://itfreetraining.com for our always free training videos. This is only one video from the many free courses available on YouTube.

References
"MCTS 70-640 Configuring Windows Server 2008 Active Directory Second edition" pg 440-441
"Domain name" http://en.wikipedia.org/wiki/Domain_name
"Domain Counts & Internet Statistics" http://www.whois.sc/internet-statistics