

Domain system server 3430

[Technology](#), [Computer](#)



Domain System Network software generally needs a 32-bit Internet address in

order to open a connection or send a datagram. However users prefer to deal with

computer names rather than numbers. Thus there is a database that allows the

software to look up a name and find the corresponding number. When the Internet

was small, this was easy. Each system would have a file that listed all of the

other systems, giving both their name and number. There are now too many

computers for this approach to be practical. Thus these files have been replaced

by a set of name servers that keep track of host names and the corresponding

Internet addresses. (In fact these servers are somewhat more general than that.

This is just one kind of information stored in the domain system.) Note that a

set of interlocking servers are used, rather than a single central one. There

are now so many different institutions connected to the Internet that it would

be impractical for them to notify a central authority whenever they installed or

moved a computer. Thus naming authority is delegated to individual institutions.

The name servers form a tree, corresponding to institutional structure. The names themselves follow a similar structure. A typical example is the name BORAX. LCS. MIT. EDU. This is a computer at the Laboratory for Computer Science (LCS)

at MIT. In order to find its Internet address, you might potentially have to consult 4 different servers. First, you would ask a central server (called the root) where the EDU server is. EDU is a server that keeps track of educational

institutions. The root server would give you the names and Internet addresses of

several servers for EDU. (There are several servers at each level, to allow for the possibility that one might be down.) You would then ask EDU where the server

for MIT is. Again, it would give you names and Internet addresses of several servers for MIT. Generally, not all of those servers would be at MIT, to allow

for the possibility of a general power failure at MIT. Then you would ask MIT where the server for LCS is, and finally you would ask one of the LCS servers about BORAX. The final result would be the Internet address for

BORAX. LCS. MIT. EDU. Each of these levels is referred to as a "domain".

The entire name, BORAX. LCS. MIT. EDU, is called a "domain name". (So are the names of the higher-level domains, such as LCS. MIT. EDU, MIT. EDU, and EDU.)

Fortunately, you don't really have to go through all of this most of the time.

First of all, the root name servers also happen to be the name servers for the top-level domains such as EDU. Thus a single query to a root server will get you

to MIT. Second, software generally remembers answers that it got before. So once

we look up a name at LCS. MIT. EDU, our software remembers where to find servers

for LCS. MIT. EDU, MIT. EDU, and EDU. It also remembers the translation of

BORAX. LCS. MIT. EDU. Each of these pieces of information has a "time to

live" associated with it. Typically this is a few days. After that, the

information expires and has to be looked up again. This allows institutions to change things. The domain system is not limited to finding out Internet addresses. Each domain name is a node in a database. The node can have records that define a number of different properties. Examples are Internet address, computer type, and a list of services provided by a computer. A program can ask for a specific piece of information, or all information about a given name. It is possible for a node in the database to be marked as an "alias" (or nickname) for another node. It is also possible to use the domain system to store information about users, mailing lists, or other objects. There is an Internet standard defining the operation of these databases, as well as the protocols used to make queries of them. Every network utility has to be able to make such queries, since this is now the official way to evaluate host names. Generally utilities will talk to a server on their own system. This server will take care of contacting the other servers for them. This keeps down the amount

of code that has to be in each application program. The domain system is particularly important for handling computer mail. There are entry types to define what computer handles mail for a given name, to specify where an individual is to receive mail, and to define mailing lists.