DNS Overview

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The basics

- Every machine on the Internet (also called a "host") has a hostname and at least one ip address
- the dns system translates hostnames to ip addresses. Many hostnames may point to a single ip address (this way we can have www.yourdomain.com and www.abc.com on the same web server with one ip address)
- the dns system also tells email servers where mail should be delivered for users@yourdomain.com
- So, dns servers just hold tables of information like:

```
www.yourdomain.com = 64.12.5.2
mail.yourdomain.com = 64.12.5.5
newsite.yourdomain.com = 64.12.5.9
yourdomain.com  MX = mail.yourdomain.com
```

(mail.yourdomain.com is the "Mail eXchanger" for yourdomain.com)

What if I want to point www.joesmith.com to www.yourdomain.com/joesmith?

- www.yourdomain.com/joesmith identifies a host and a path to a directory on that host (the part after the slash)
- dns can only point hostnames (like www.yourdomain.com) to ip addresses. It knows nothing about directory paths
- to make this work, we need to use a combination of dns and web server configuration
- there are several ways to do this:

1. Use dns to point www.joesmith.com to the same ip address as www.yourdomain.com. Then, use Host Headers or other "Virtual Site" features of the web server software to direct the www.joesmith.com browsing to the joesmith directory.

2. Use dns to point www.joesmith.com to the ip address of some other web server. Use scripting and/or features mentioned above to redirect browsers to www.yourdomain.com/joesmith

DNS Lookup Process

(1) Web user with myISP.com needs to look up ip address for www.abc.com.
The user's computer sends a query to the myISP dns server.

myISP's dns server

(5) myISP's dns server returns the ip address to the user

(2) myISP's dns server asks the main Internet dns servers, "where is the dns server for abc.com?"

(4) myISP's dns server gets the address for www.abc.com from nameserver.abc.com

root dns servers

(3) root dns servers say, "ask nameserver.abc.com"

nameserver.abc.com

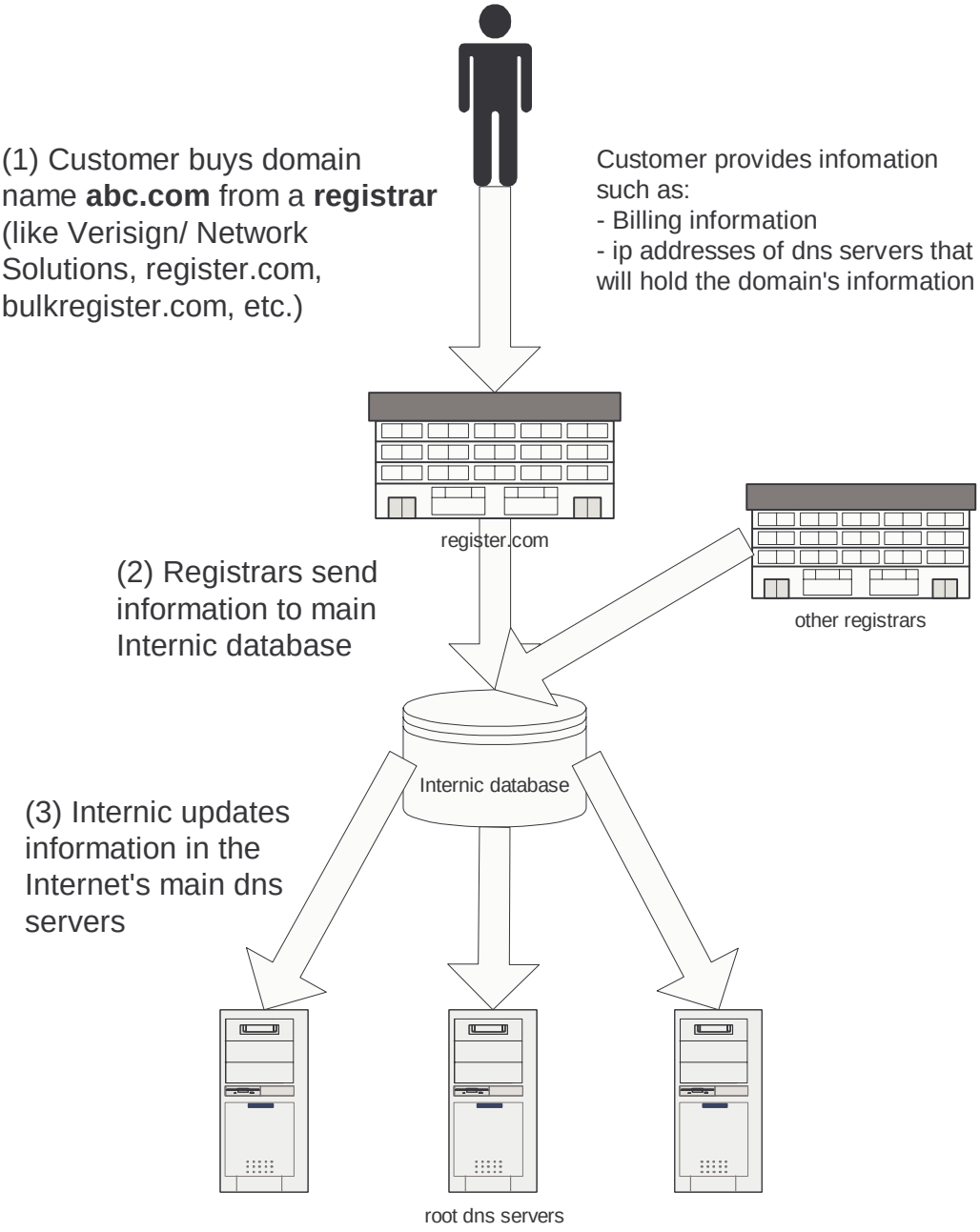
nameserver contains info like:

```
www.abc.com = 64.12.5.2
mail.abc.com = 64.12.5.5
newsite.abc.com = 64.12.5.9
mail for users@abc.com should be
   directed to "mail.abc.com"
```

DNS Registration Process

(1) Customer buys domain name **abc.com** from a **registrar** (like Verisign/ Network Solutions, register.com, bulkregister.com, etc.)

Customer provides infomation such as:
- Billing information
- ip addresses of dns servers that will hold the domain's information



(2) Registrars send information to main Internic database

(3) Internic updates information in the Internet's main dns servers

root dns servers contain info like:

```
ccci.org queries should be referred
      to ns1.ccci.org
abc.com queries should be referred
      to nameserver.abc.com
```