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# Dynamic DNS

*What is it?*

*Who needs it?*

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# Dynamic DNS

If you haven't got a STATIC IP address, you have a dynamic IP.

Your IP is assigned by your ISP, and it's going to change any time: when you reboot the router and maybe just overnight for no reason.

This doesn't matter, unless you have an always-on computer at home, that you want to reach from the outside world.

This talk is all about how I stay connected.

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# Home server



Dreamplug - a little bit more than a Raspberry Pi

- Mains powered, 19watts
- Debian Linux
- ARM9E @ 1.2GHz SoC
- 2 x Ethernet ports
- 2 x USB 2.0
- eSATA 2.0 port for HDD / SSD
- SD socket for expansion
- WiFi: 802.11 b/g/n
- Bluetooth 2.1
- Audio in/out and S/PDIF
- JTAG port

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# Home server



## My Dreamplug:

- Domain server for woodscooter.com
- Receives email for woodscooter.com
- Accepts ssh connections
- Cron controls lights, heat and curtains in the house
- Implements DDNS
- Accepts commands to switch heating on and off, from my mobile phone.

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# Static IP

To understand dynamic DNS lookup, we first have to take a look at how it's done with a static IP address

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# Static IP

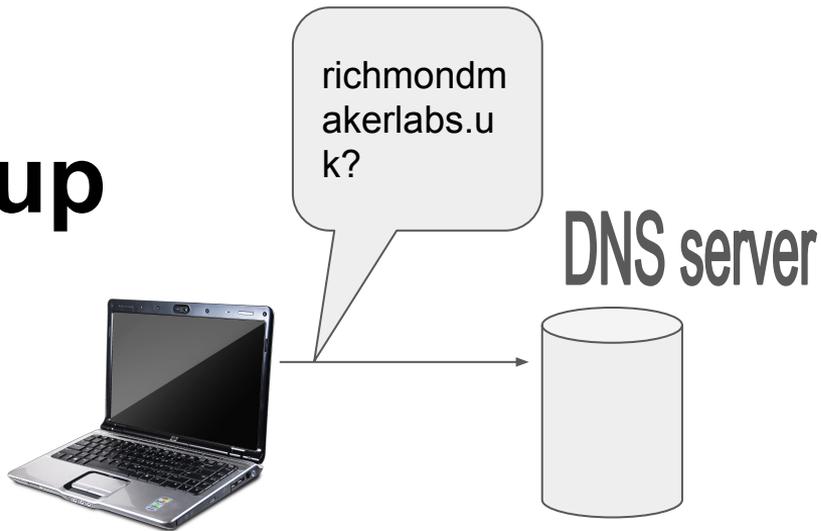
richmondmakerlabs.uk has two static IP addresses

- the virtual server at bitfolk
- the LittleHouse server novo

Your browser wants to see the mainpage at  
<http://richmondmakerlabs.uk>.

How does it look up the IP of that website?

# DNS Lookup



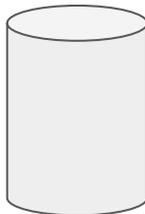
Your browser asks the DNS server. This may be provided by your ISP, or you might use Google's DNS, or use the OpenDNS servers.

# DNS Lookup



richmondm  
akerlabs.u  
k?

DNS server



root server



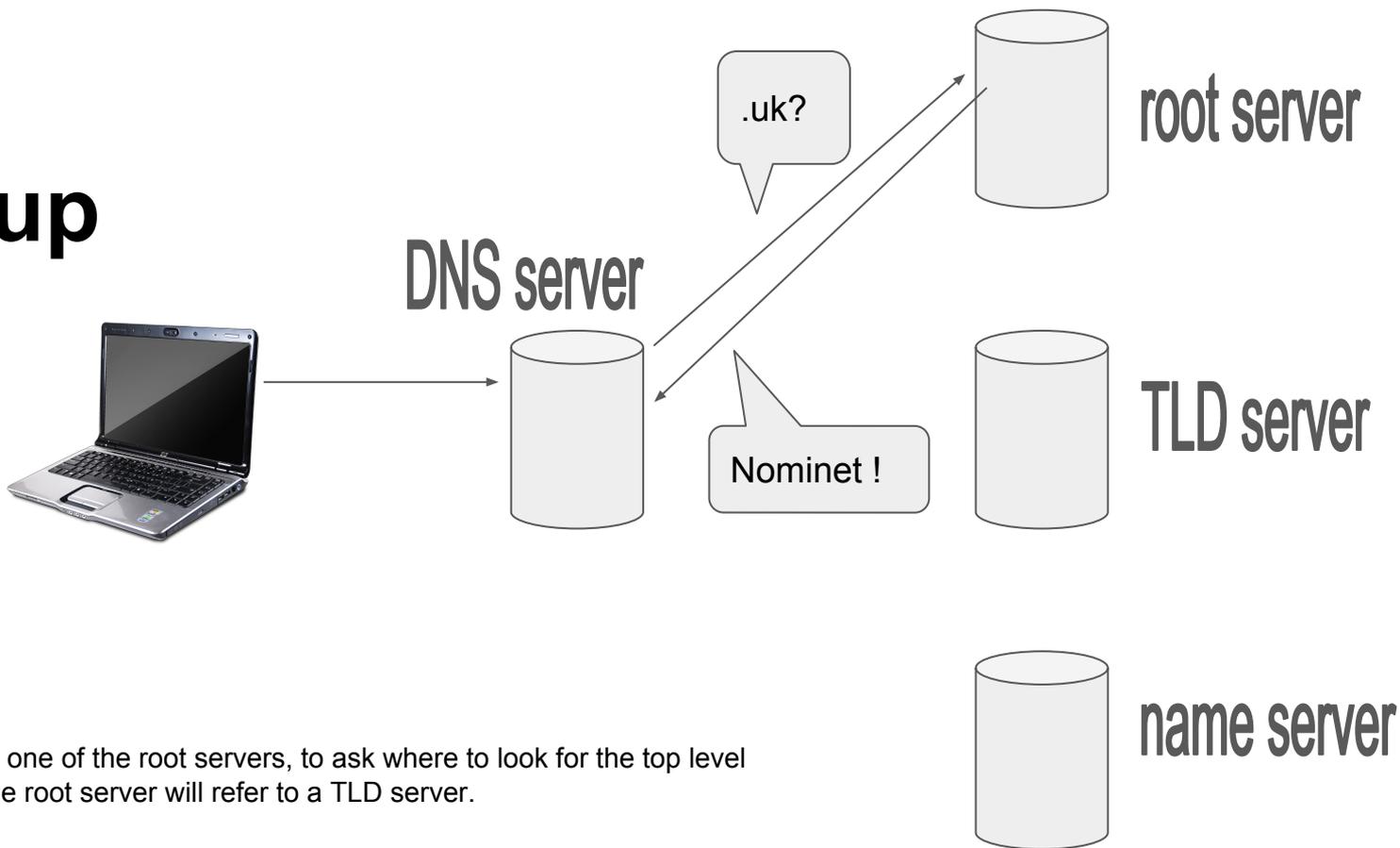
TLD server



name server

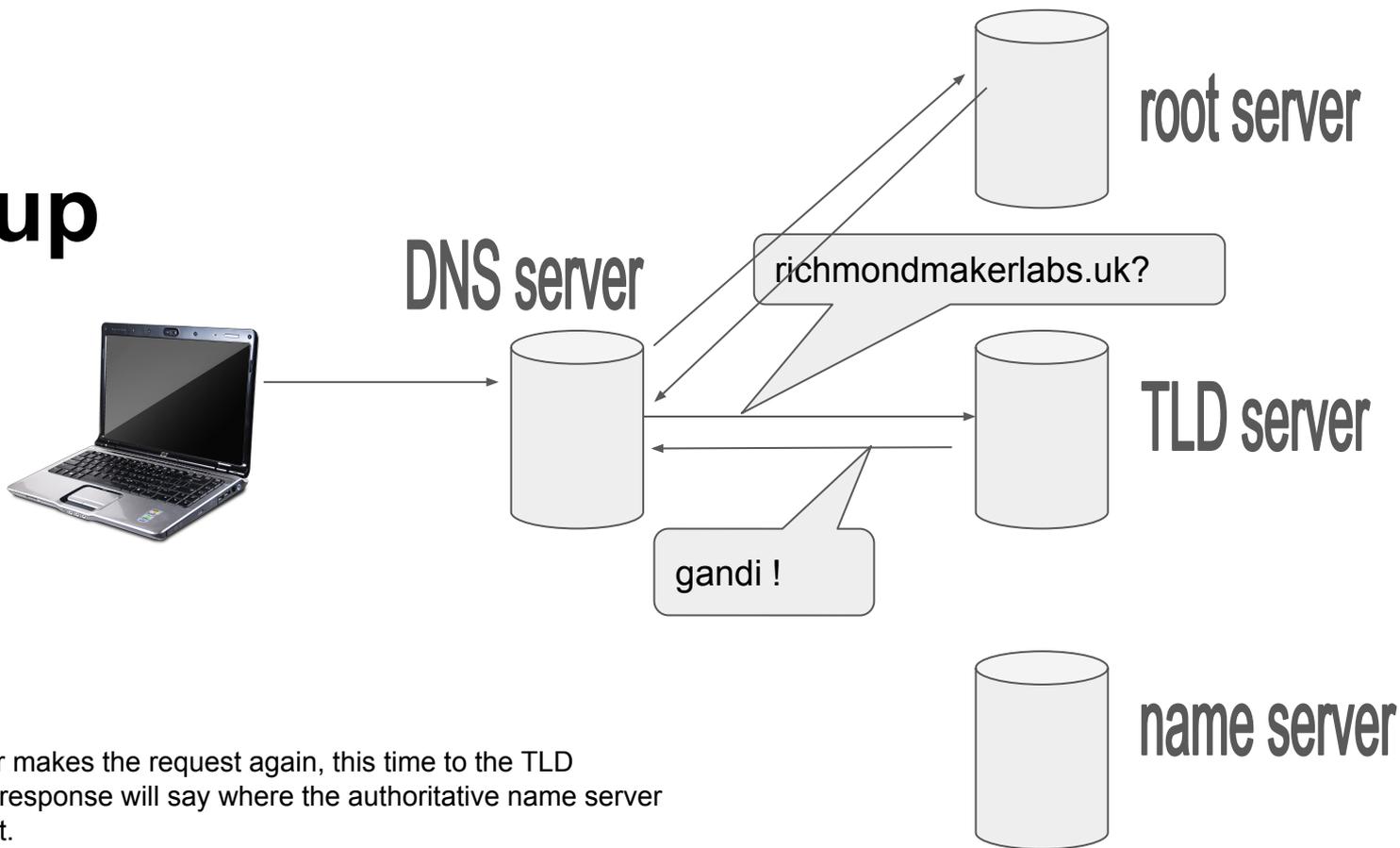
The DNS server might have the answer already in its cache, in which case it will give an immediate response. But most likely, it will need to look it up.

# DNS Lookup



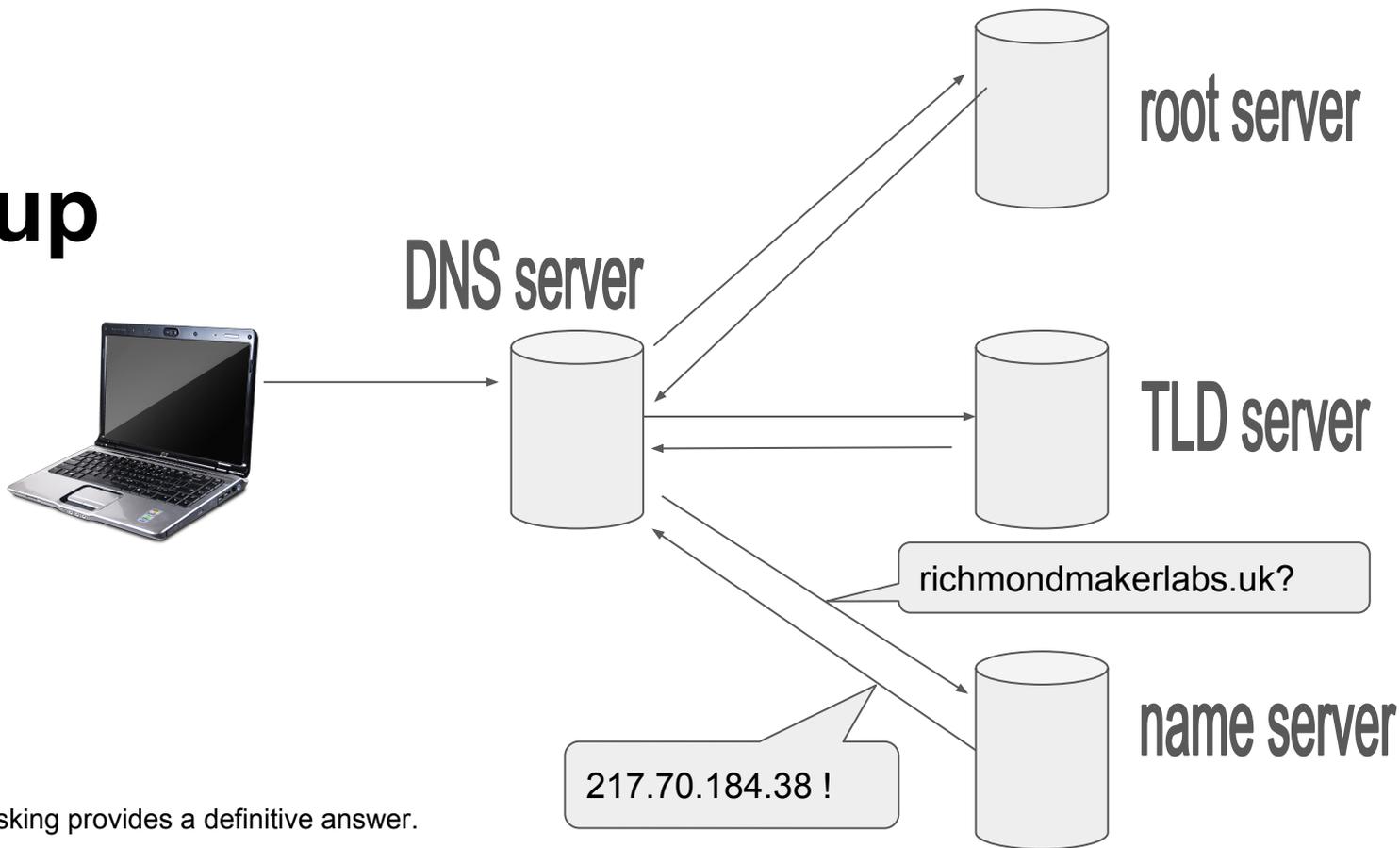
First query is to one of the root servers, to ask where to look for the top level domain .uk. The root server will refer to a TLD server.

# DNS Lookup



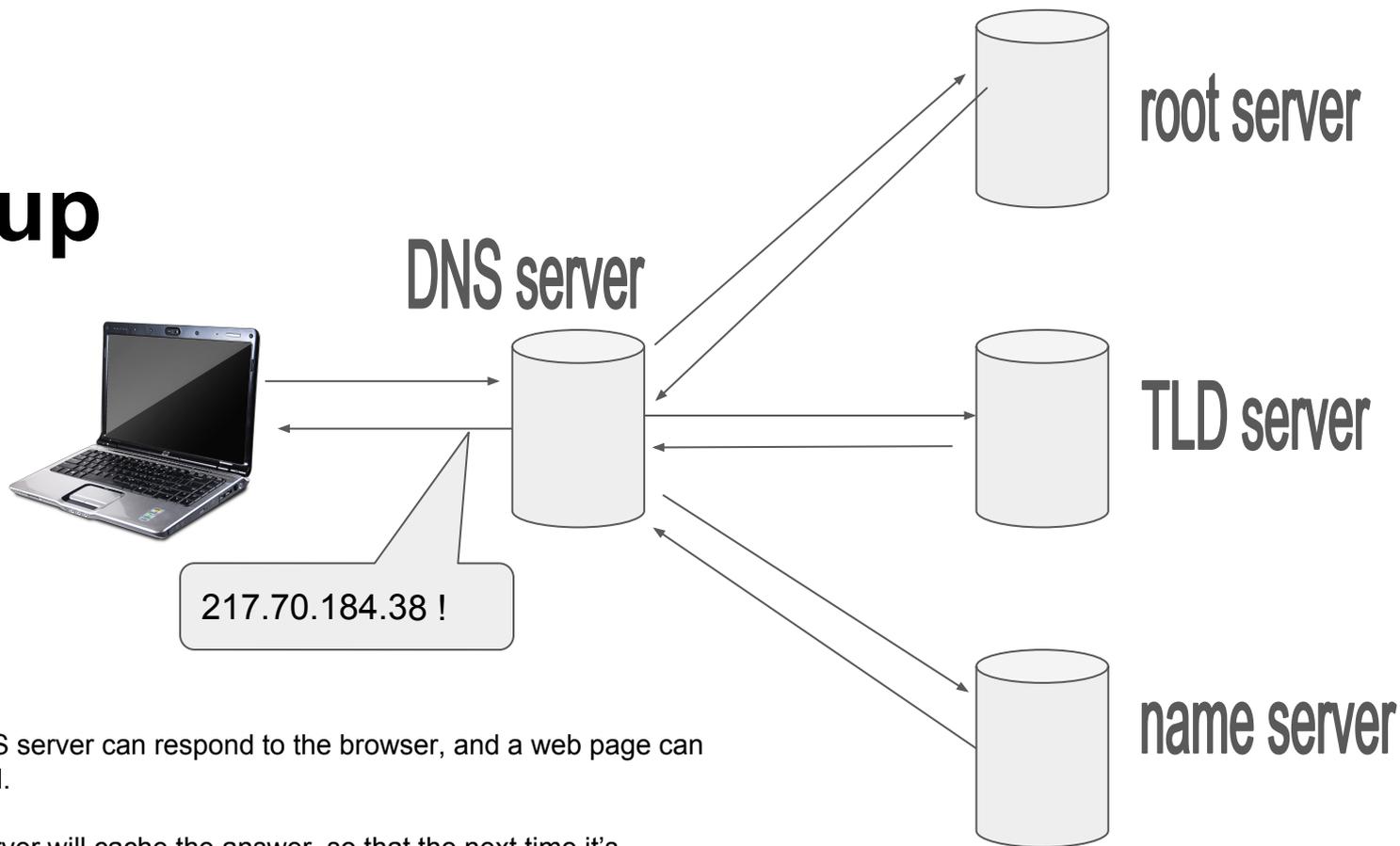
The DNS server makes the request again, this time to the TLD server, and the response will say where the authoritative name server records are kept.

# DNS Lookup



Third time of asking provides a definitive answer.

# DNS Lookup



Now the DNS server can respond to the browser, and a web page can be requested.

The DNS server will cache the answer, so that the next time it's asked, it does not have to generate all that internet traffic.

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# Dynamic IP

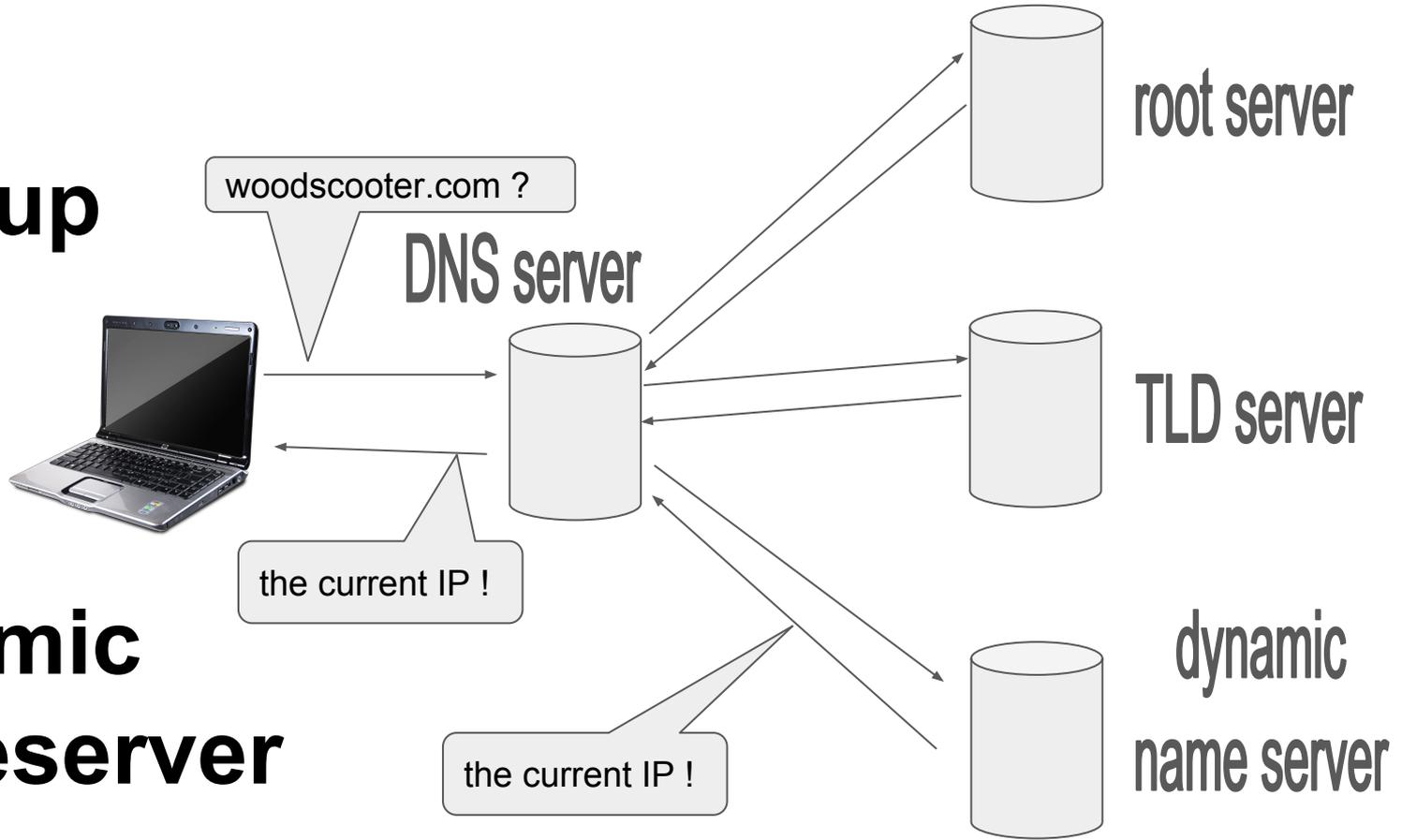
The process is very much the same if you have an IP that changes from time to time.

You need a domain name, of course.

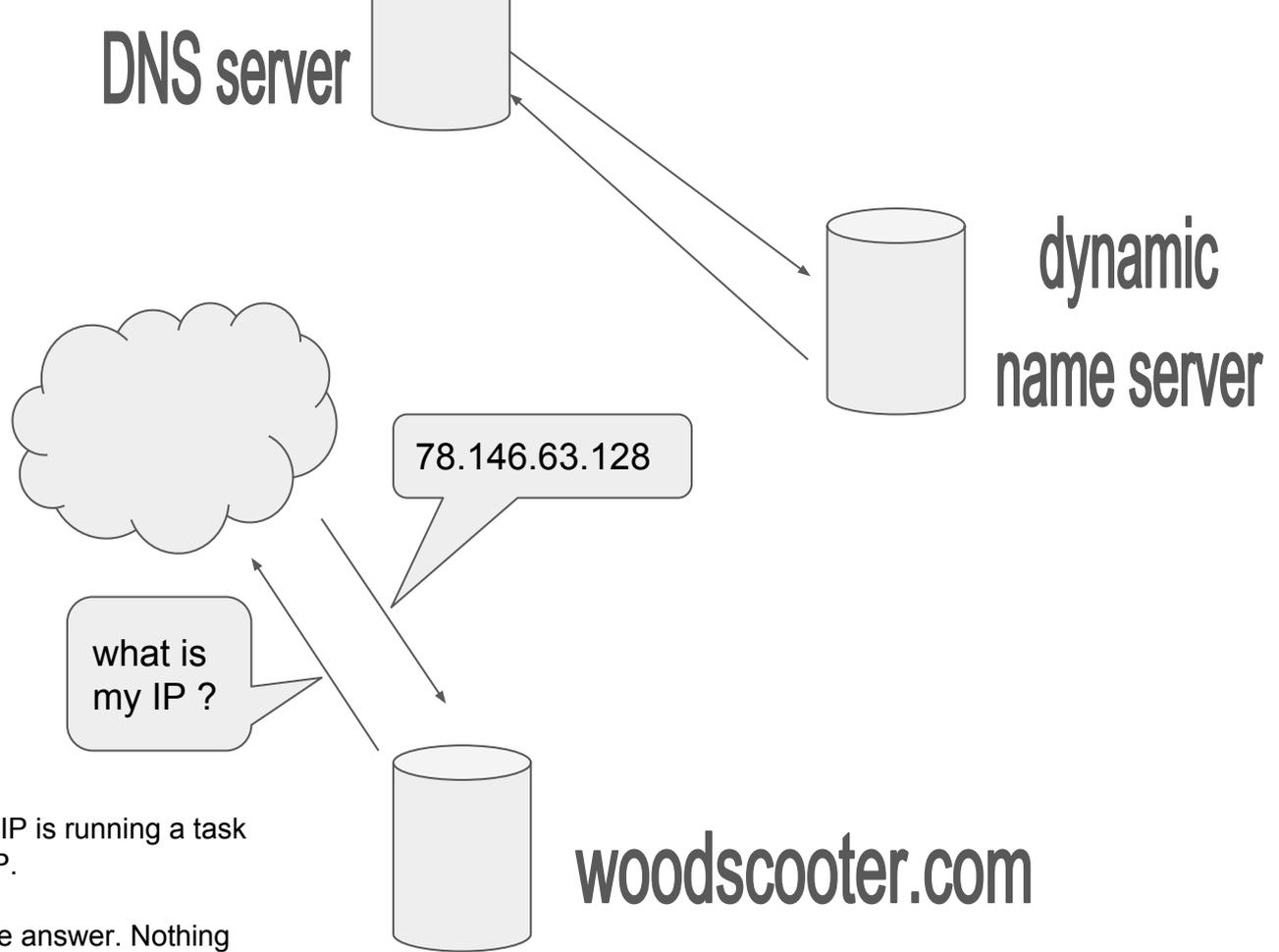
But the **name server** must be able to cope with speedy updates to your IP record.

# DNS Lookup

with  
dynamic  
nameserver



# Web server

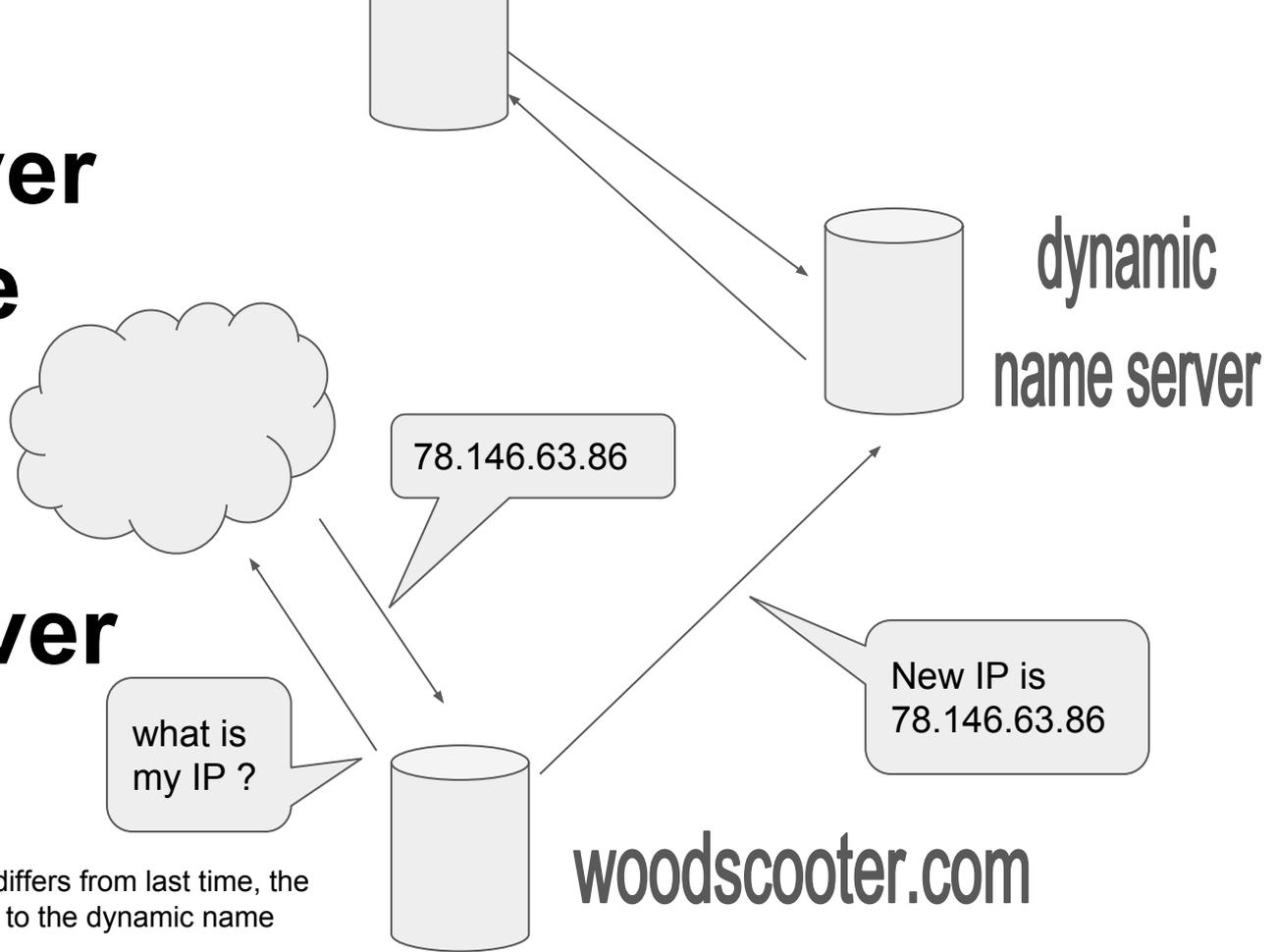


The server that's on a changing IP is running a task every 15 minutes, checking its IP.

Most of the time, it gets the same answer. Nothing else happens.

# Web server IP Update with dynamic nameserver

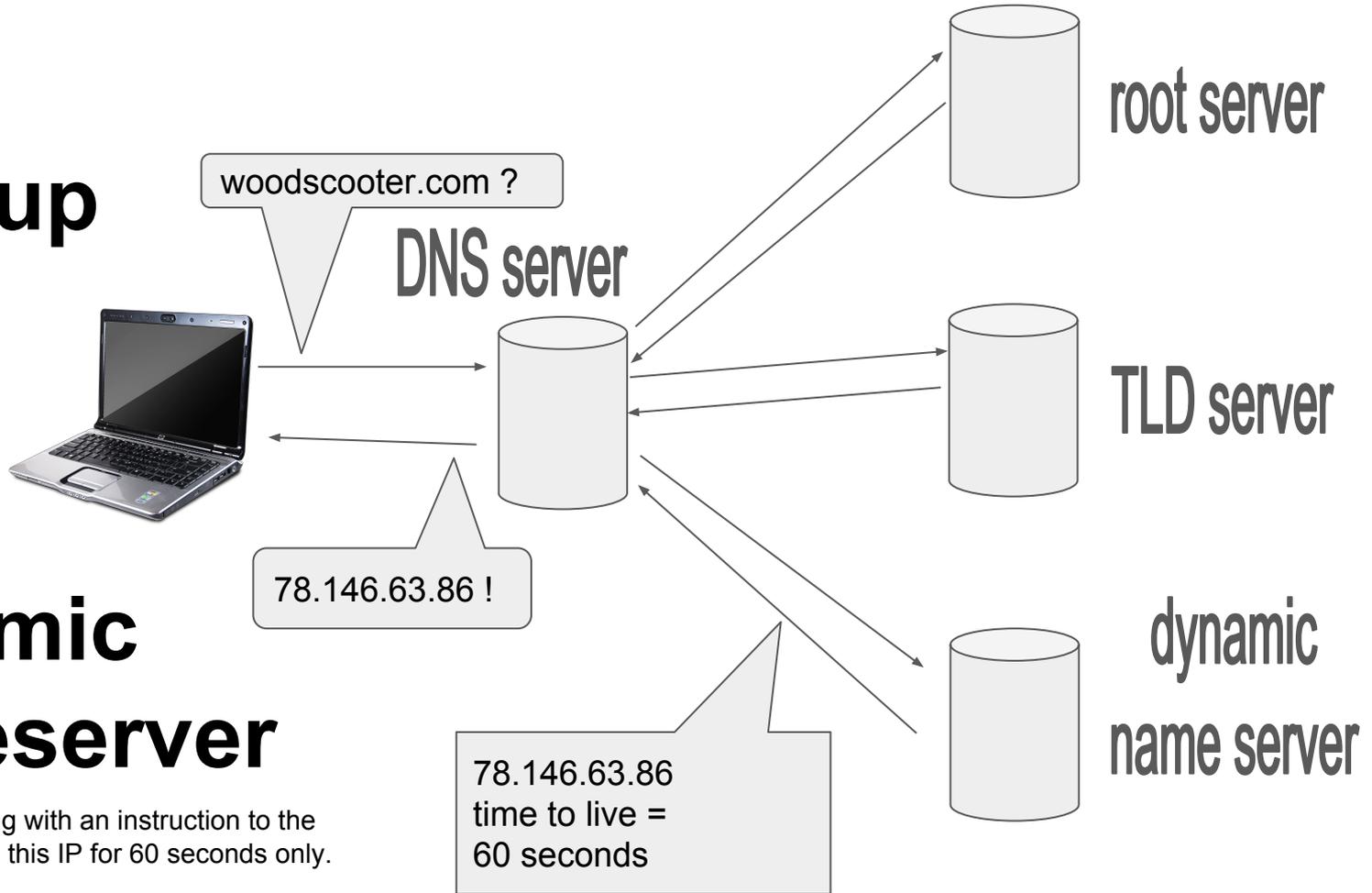
If the query returns an IP that differs from last time, the server sends a short message to the dynamic name server to update it.



# DNS Lookup

## with dynamic nameserver

The IP is sent along with an instruction to the local DNS to cache this IP for 60 seconds only.



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# Dynamic DNS

Now I can reach my server when away from home.

- I can ssh into it from a laptop or mobile phone.
- I can send home automation commands or status requests
- I could do more if I had the imagination and the time to set it up!

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# Dynamic DNS

There are organisations who provide dynamic name servers.

DynDNS: support is built-in to many routers

FreeDNS: my choice, I have used FreeDNS for about 5 years now.

EasyDNS: why not ?

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**END**