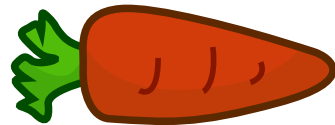


LocalRoot – Serve Yourself



Wes Hardaker
hardaker@isi.edu
USC / ISI

What Is LocalRoot?

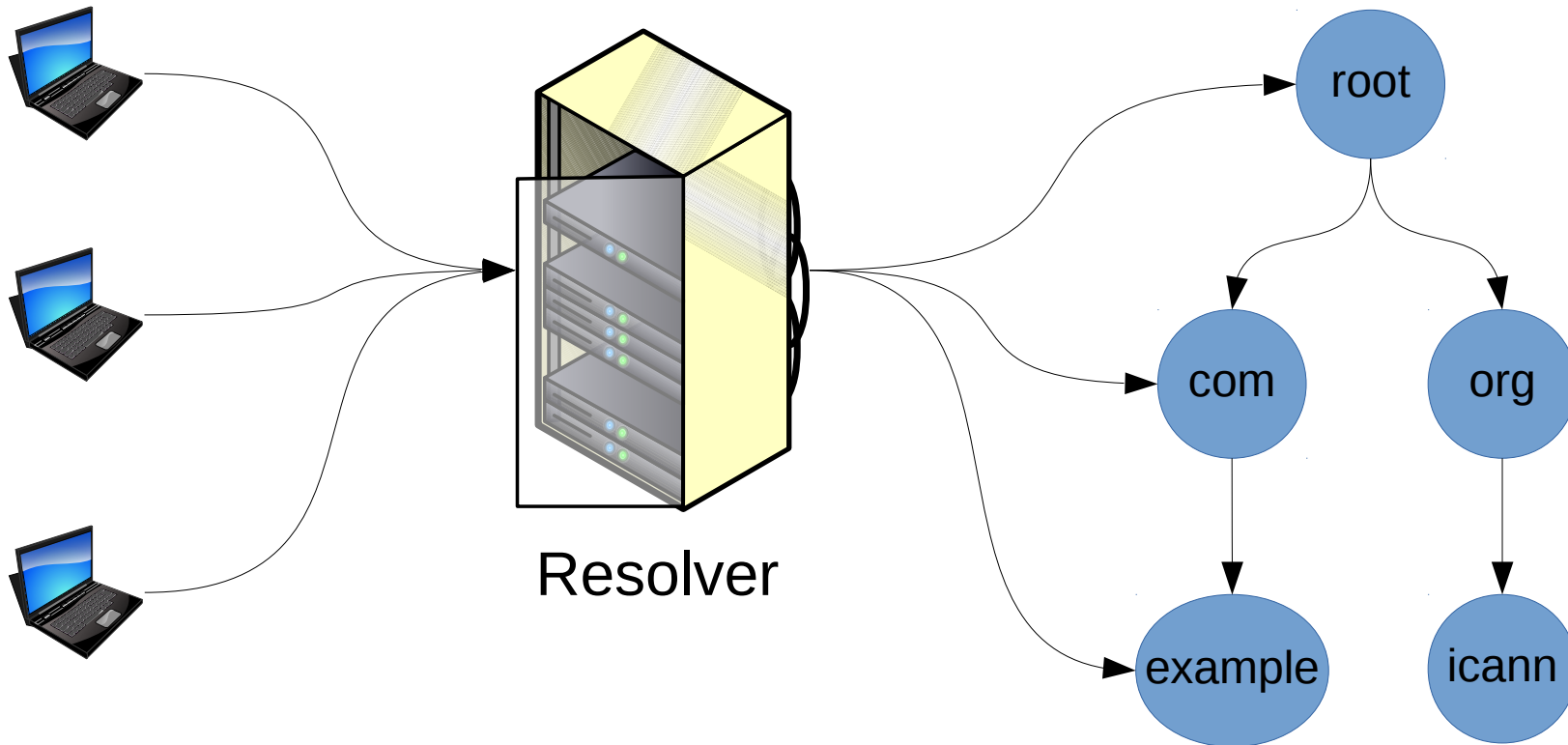
- A project to let you load root data into your resolvers

Classic DNS Resolution

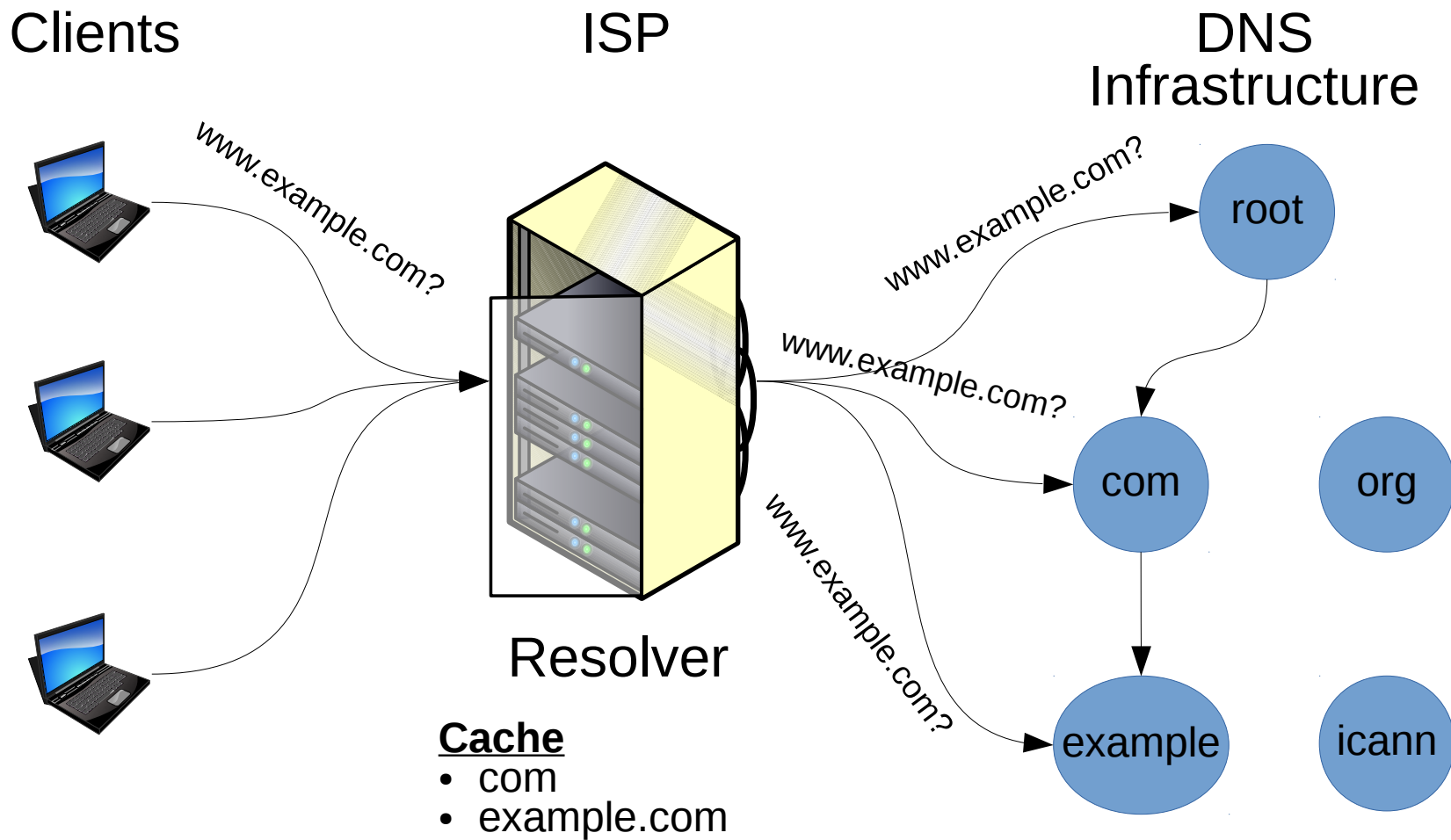
Clients

ISP

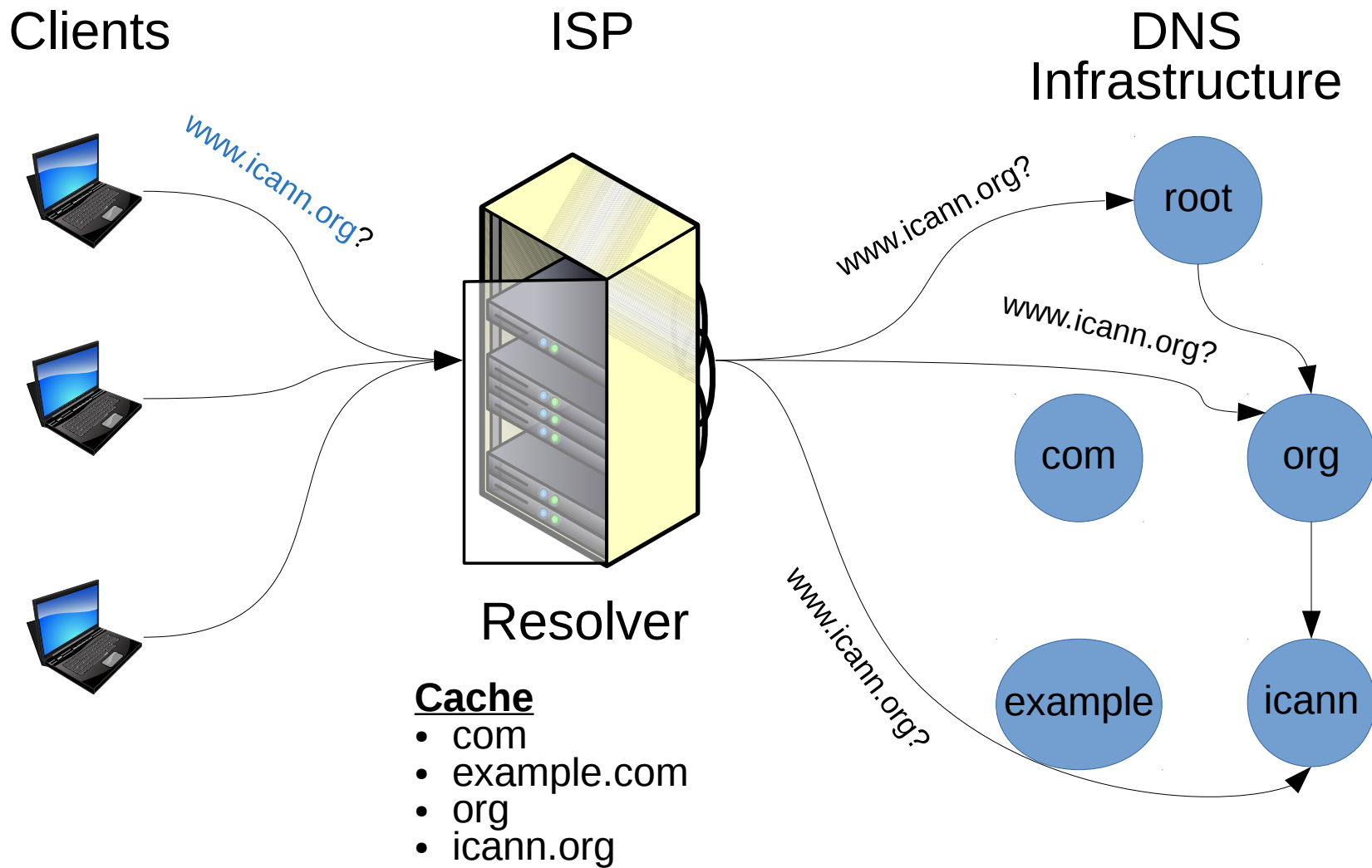
DNS
Infrastructure



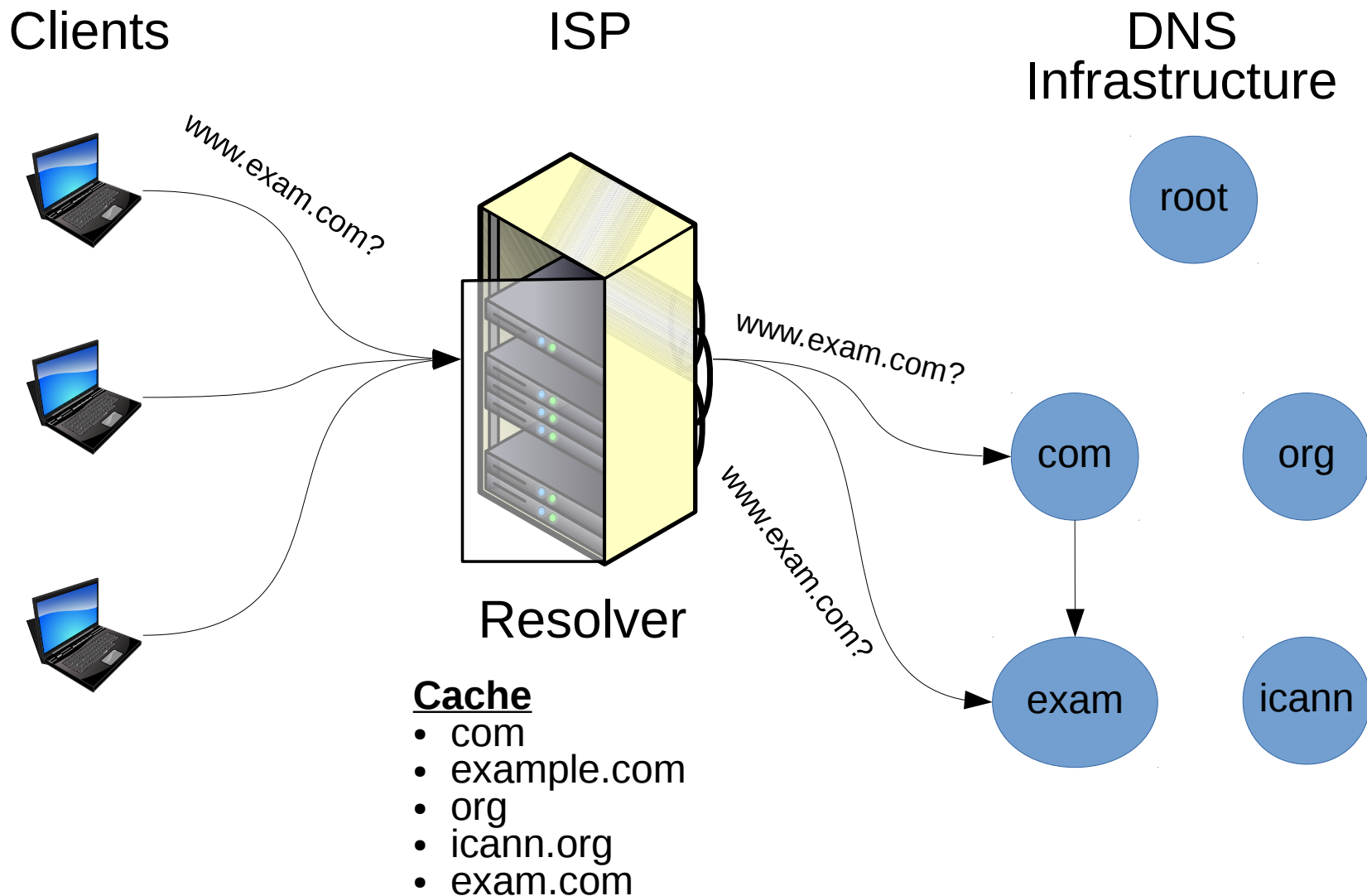
Classic DNS Resolution



Classic DNS Resolution



Classic DNS Resolution

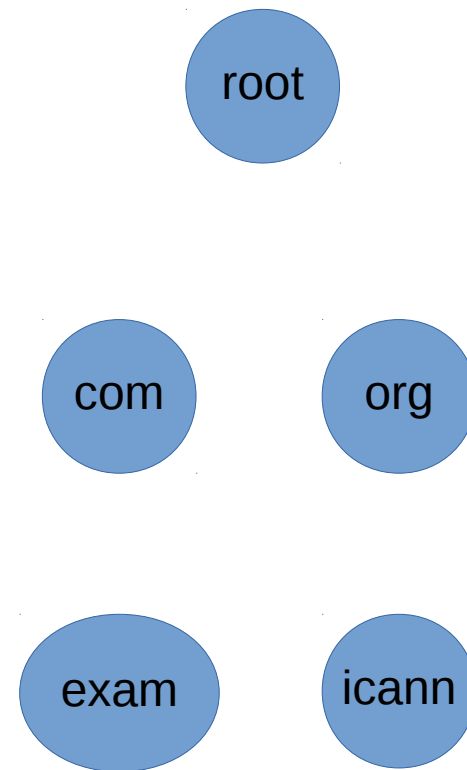
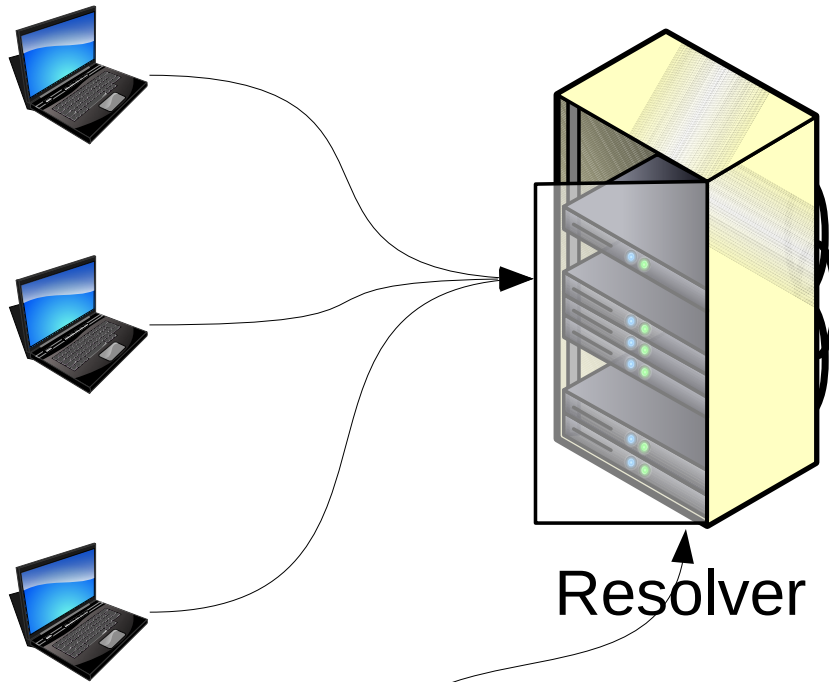


DNS Resolution With LocalRoot

Clients

ISP

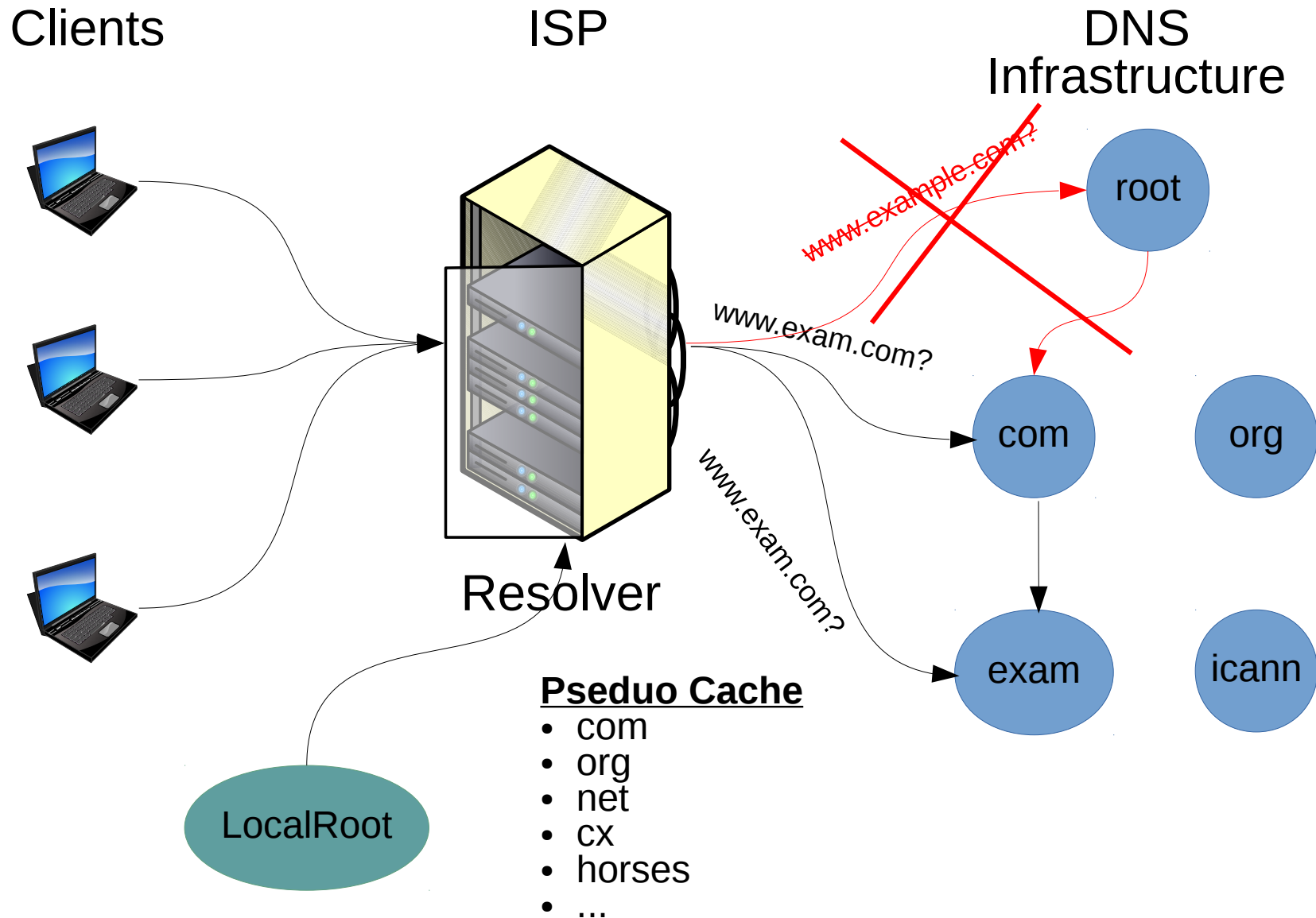
DNS
Infrastructure



Pseduo Cache

- com
- org
- net
- cx
- horses
- ...

DNS Resolution With LocalRoot

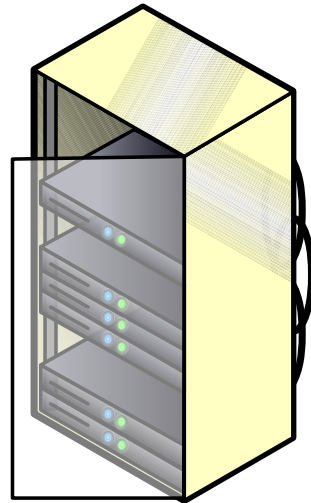


LocalRoot: notifications on change

Clients



ISP



Resolver

DNS
Infrastructure

root

com

org

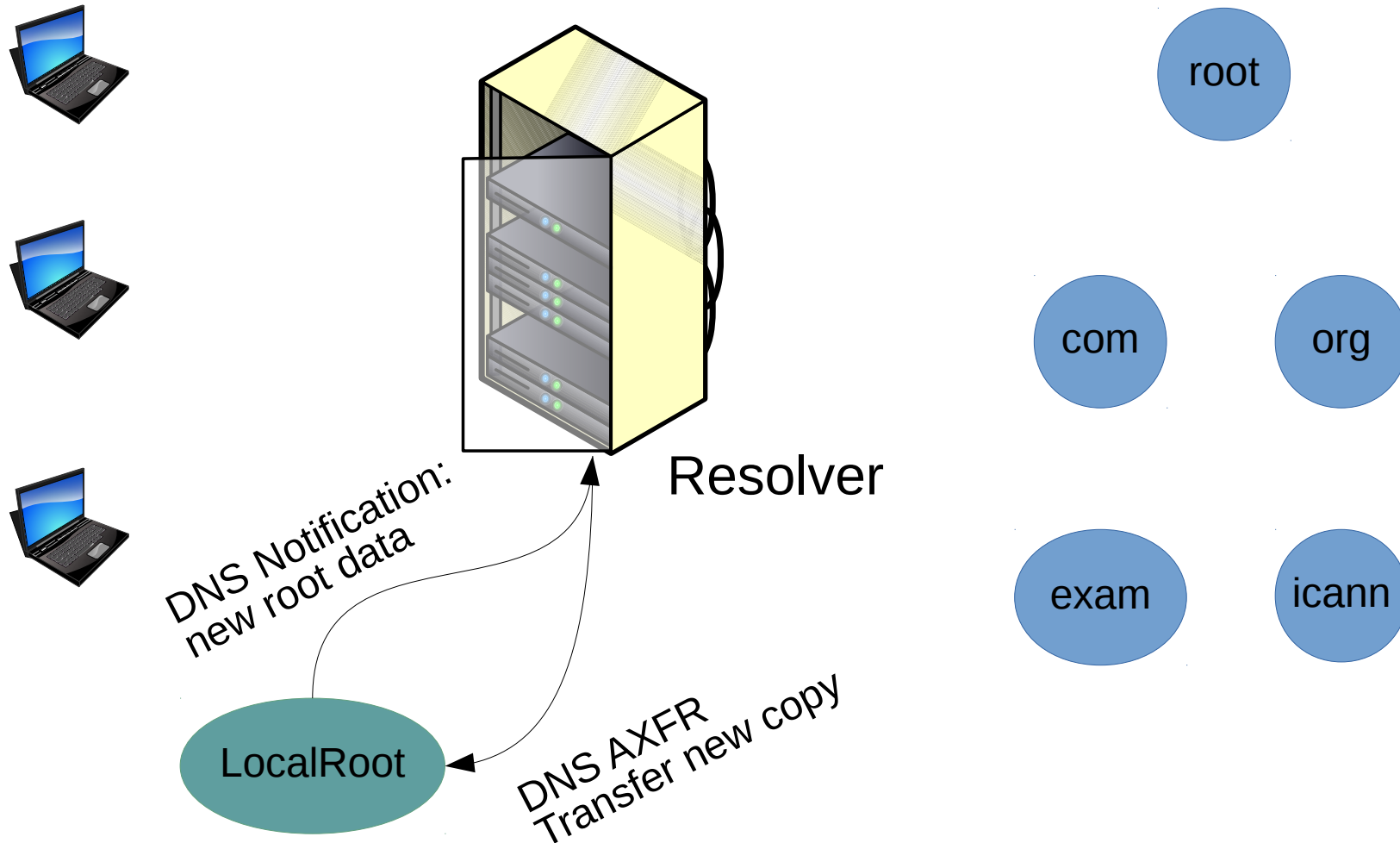
exam

icann

DNS Notification:
new root data

LocalRoot

DNS AXFR
Transfer new copy



Why Use LocalRoot?

- Benefits
 - “Pseudo-caching” of the root-data
 - Remove need to contact the root
 - Faster DNS lookups for first TLD lookups
- Always up to date copy of the root
- Research project of your own?
 - Trigger events after DNS notification?

LocalRoot Security

- The root data is DNSSEC signed
 - You can get it from anywhere
- LocalRoot transfers data using TSIG security

Demo!






LocalRoot

Our *LocalRoot* service allows you to serve a copy of the DNS Root Zone from your recursive resolver. For more information about *LocalRoot*, please see our [About LocalRoot](#) page and [Getting Started](#) pages.

- [About LocalRoot](#)
- [Getting Started](#)
- [Register](#)
- [Login](#)



Register

    I'm not a robot 
reCAPTCHA
[Privacy](#) - [Terms](#)



LocalRoot

Our *LocalRoot* service allows you to serve a copy of the DNS Root Zone from your recursive resolver. For more information about *LocalRoot*, please see our [About LocalRoot](#) page and [Getting Started](#) pages.

- [About LocalRoot](#)
- [Getting Started](#)
- [Your TSIG Keys](#)
- [Your Servers](#)
- [Logout](#)



LocalRoot: Getting Started

To deploy the LocalRoot service within your recursive resolver, please follow these steps:

- 1** Create a **TSIG key** to protect the transactions. [\[more info...\]](#)
- 2** Create a **server entry** for your recursive resolver using it's public IP address.
- 3** Perform a manual AXFR transfer from your recursive resolver. Within 5 minutes after you perform this step, the checkbox in the **"Active"** column will switch to a checkbox (✓). *Note: the transfer MUST come from the IP address you registered in step 2.* [\[more info...\]](#)
- 4** After the checkmark becomes active in **your list of servers**, add the configuration snippet from the link in the **Config** column for either **ISC's Bind** or **Unbound** and add it to your recursive resolver's configuration file. *Note: If you are using views (eg, internal recursive and external authoratative), the configuration for the root zone copy will need to be put inside the internal view.* [\[more info...\]](#)



TSIG List

No TSIG keys generated yet

Create New TSIG



Create a new TSIG key

Provide a name of your choice for the new TSIG to be created. The TSIG secret key and algorithm will be automatically assigned.

Create New TSIG Record



TSIG List

Administrative Name

Algorithm

Value

my cool TSIG key

hmac-sha256

p9ibZHNqKlqxHbtav5OU6g==

[Create New TSIG](#)



Server List

No servers created yet

[Add a New Server](#)



Add a localroot-copy server

TSIG to use:

Create Server



Server List

Administrative Name	Address	TSIG	Enabled	Active	Config
my enterprise server	192.0.1.1	my cool TSIG key: p9ibZHNqKlqxHbtav5OU6g==	✓	✗	[bind]

Add a New Server

(Click on the enabled buttons to toggle)

*Servers will not be listed **active** until an hour after an initial AXFR has been seen.*

```
//
// LocalRoot:
// ISC Bind Configuration File for Root-Zone RFC 7706 Support
//
// This configuration file was generated at http://localroot.isi.edu
// For server "my enterprise server" at address: 192.0.1.1
//

//
// TSIG keys
//
key "my_cool_TSIG_key" {
    algorithm hmac-sha256;
    secret "p9ibZHNqKIqxHbtav50U6g==";
};

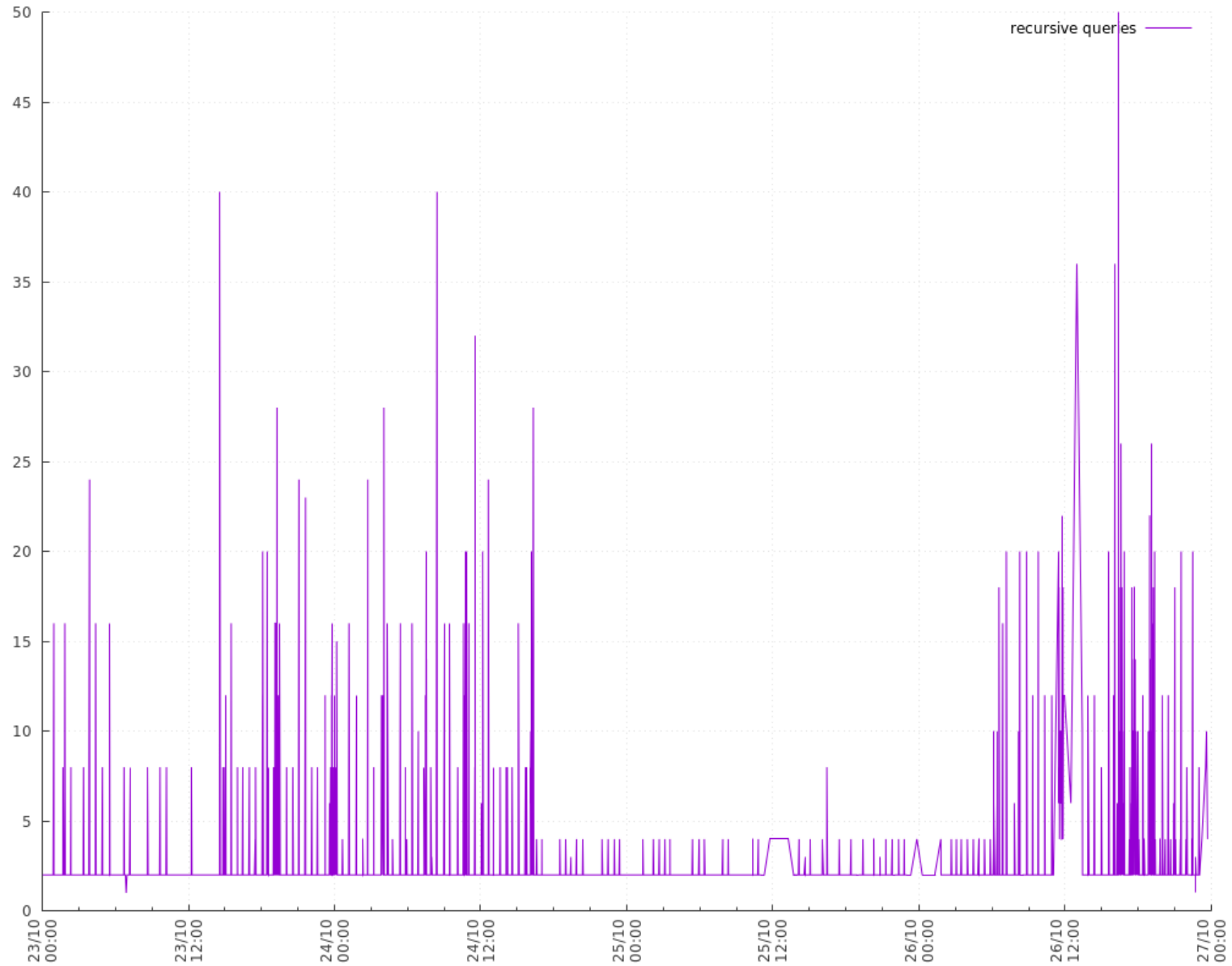
//
// upstream servers to transfer from
//

server 128.9.36.81 { keys { "my_cool_TSIG_key"; }; }; // localroot.isi.edu

zone "." {
    type slave;
    file "/var/named/slaves/root.zone";
    notify no;
    masters {
        128.9.36.81; // localroot.isi.edu

        // backup root servers that allow axfr today
        192.228.79.201; // b.root-servers.net
        2001:500:200::b; // b.root-servers.net
        192.33.4.12; // c.root-servers.net
        2001:500:2::c; // c.root-servers.net
        192.5.5.241; // f.root-servers.net
        2001:500:2f::f; // f.root-servers.net
        192.112.36.4; // g.root-servers.net
        2001:500:12::d0d; // g.root-servers.net
        193.0.14.129; // k.root-servers.net
        2001:7fd::1; // k.root-servers.net
        192.0.32.132; // xfr.lax.dns.icann.org
        2620:0:2d0:202::132; // xfr.lax.dns.icann.org
        192.0.47.132; // xfr.cjr.dns.icann.org
        2620:0:2830:202::132; // xfr.cjr.dns.icann.org
    };
};
```

Real World Effects



Questions?

- Please try it and let me know what you think
 - <https://localroot.isi.edu/>
- I would love feedback!
 - How are you using it?
 - If research-focused, what are you doing with it?
 - What other features would you like to see?