Quad9

Quad9: A Free, Secure DNS Resolver

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The Domain Name System (DNS) is the "phone book" of the Internet. It translates domain names like www.example.org into Internet Protocol addresses, like 192.0.2.89.

So What are the Problems with this System?

root nameserver
recursive resolver
.org nameserver
example.net nameserver

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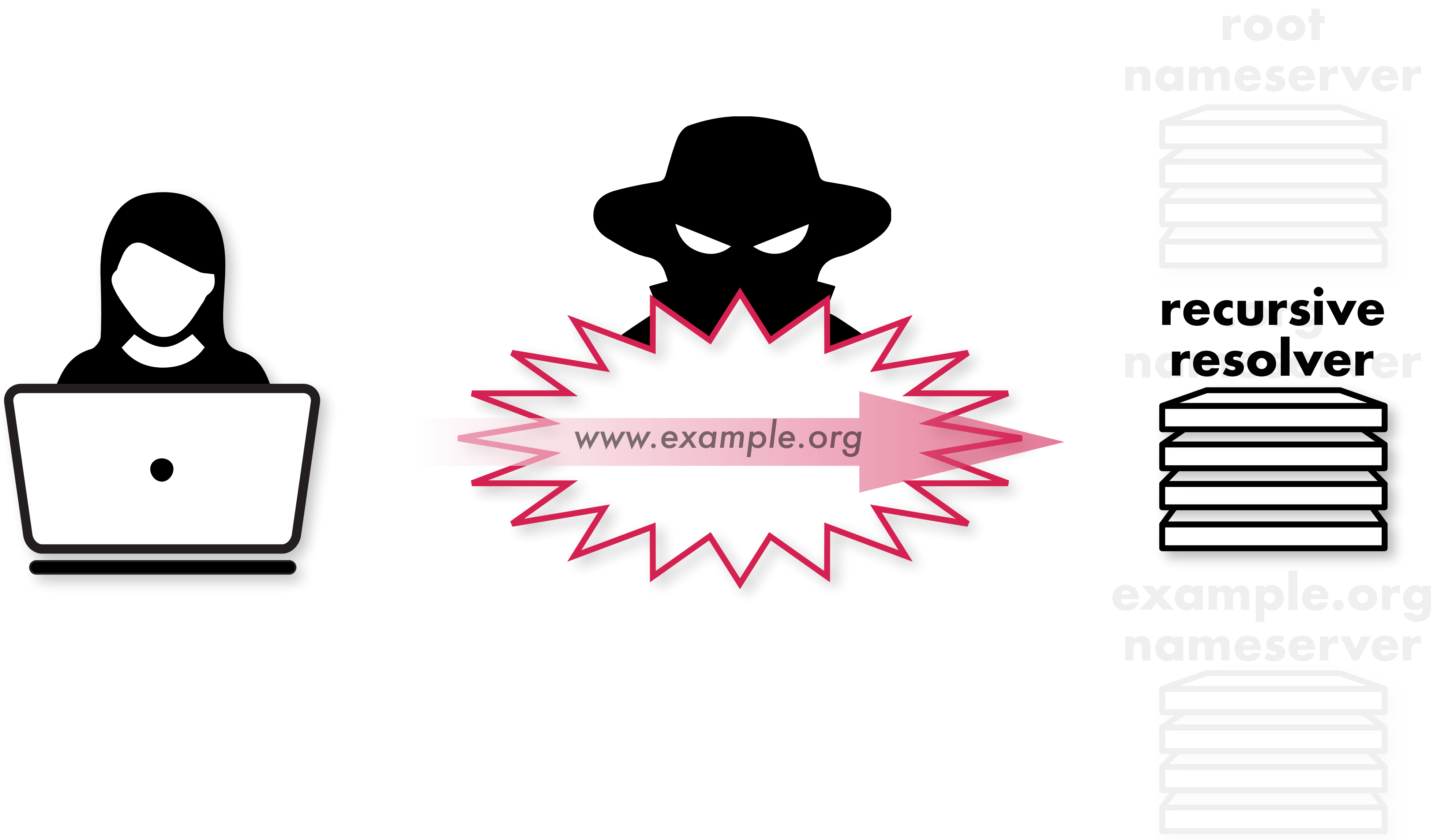

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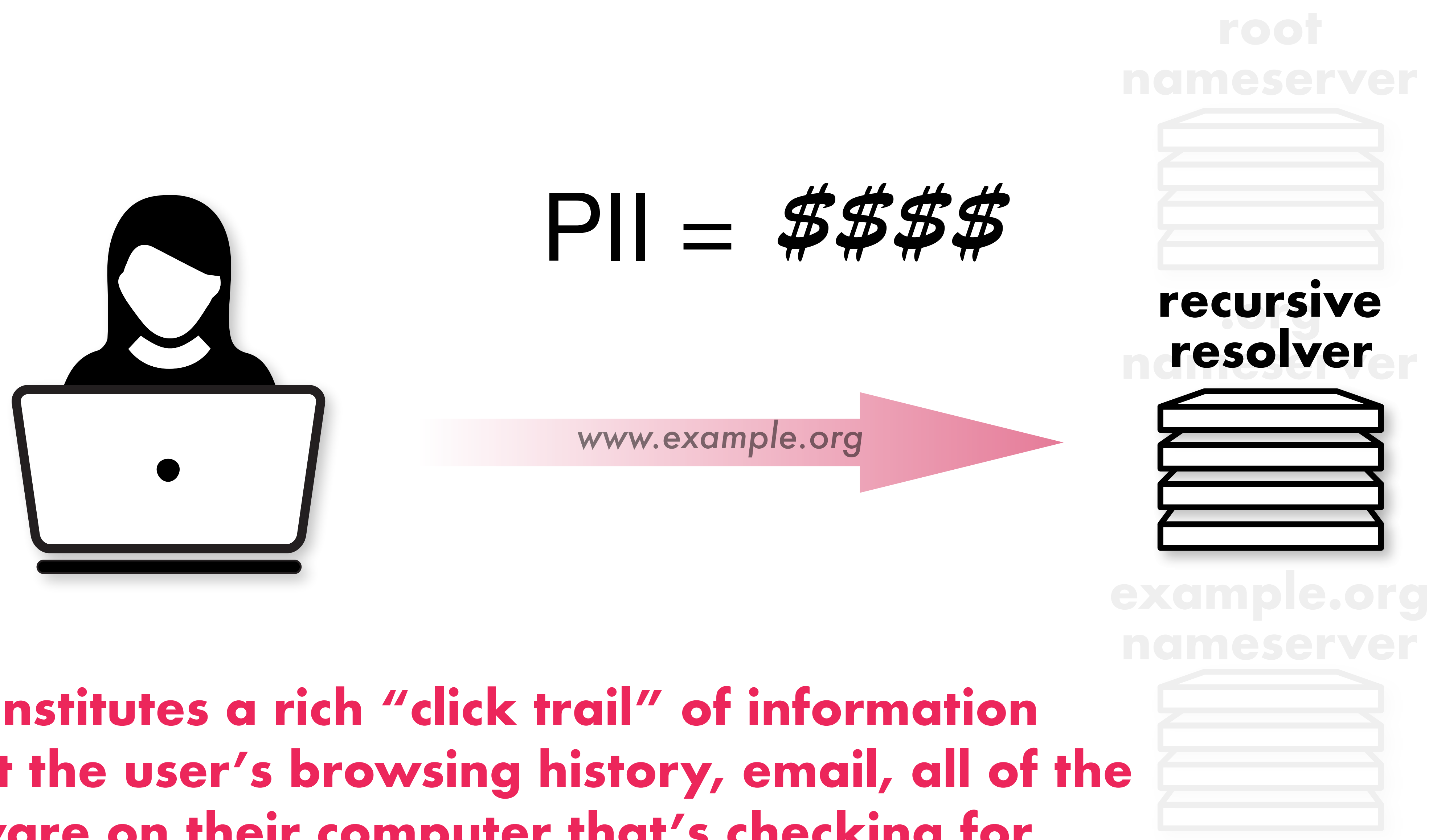

PII = $$$$

www.example.org

root nameserver

recursive resolver

.org nameserver

example.org nameserver

PII constitutes a rich "click trail" of information about the user's browsing history, email, all of the software on their computer that's checking for updates, and all of the malicious software that's infected their machine.

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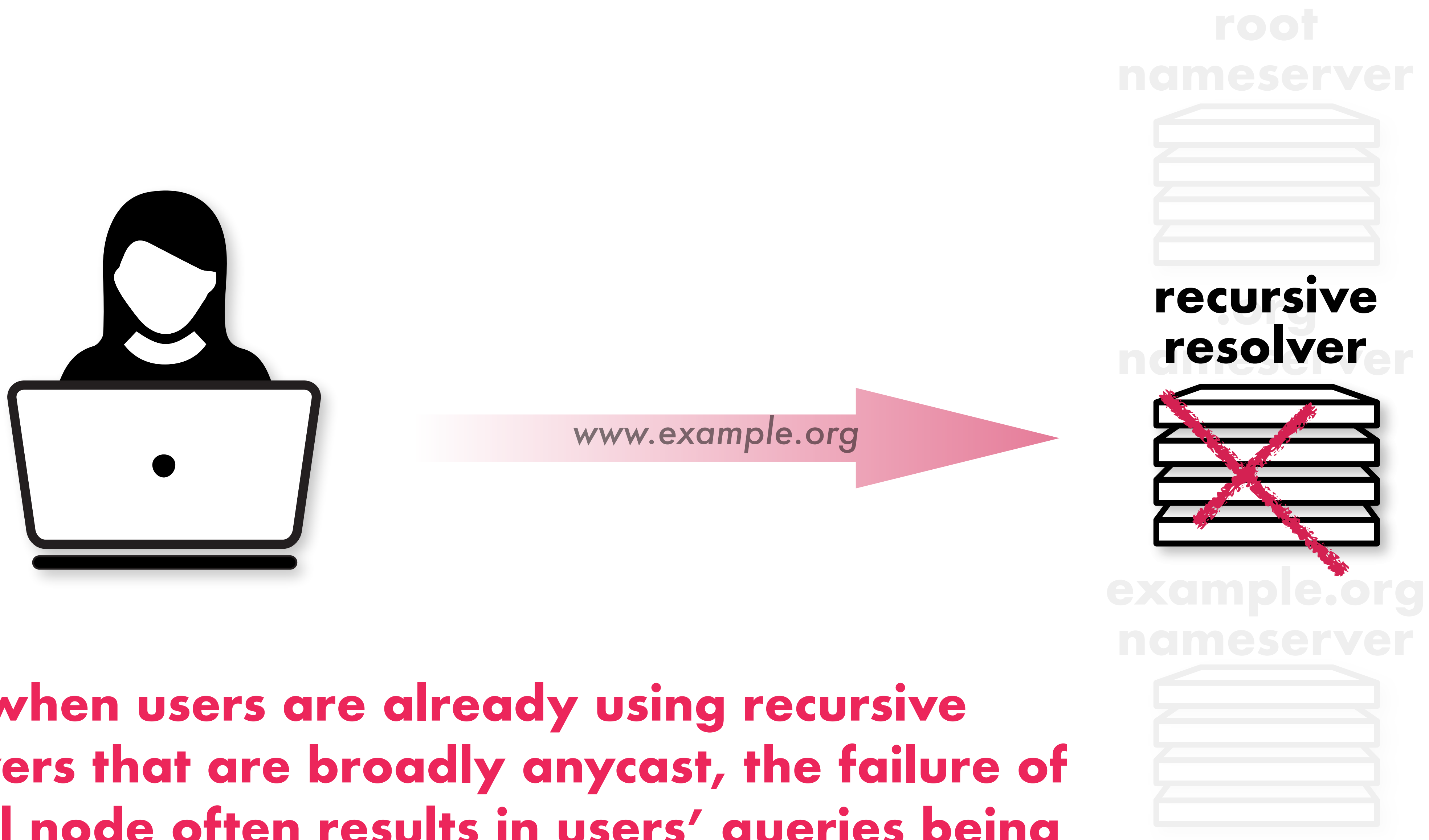

Even when users are already using recursive resolvers that are broadly anycast, the failure of a local node often results in users' queries being backhauled to other continents.

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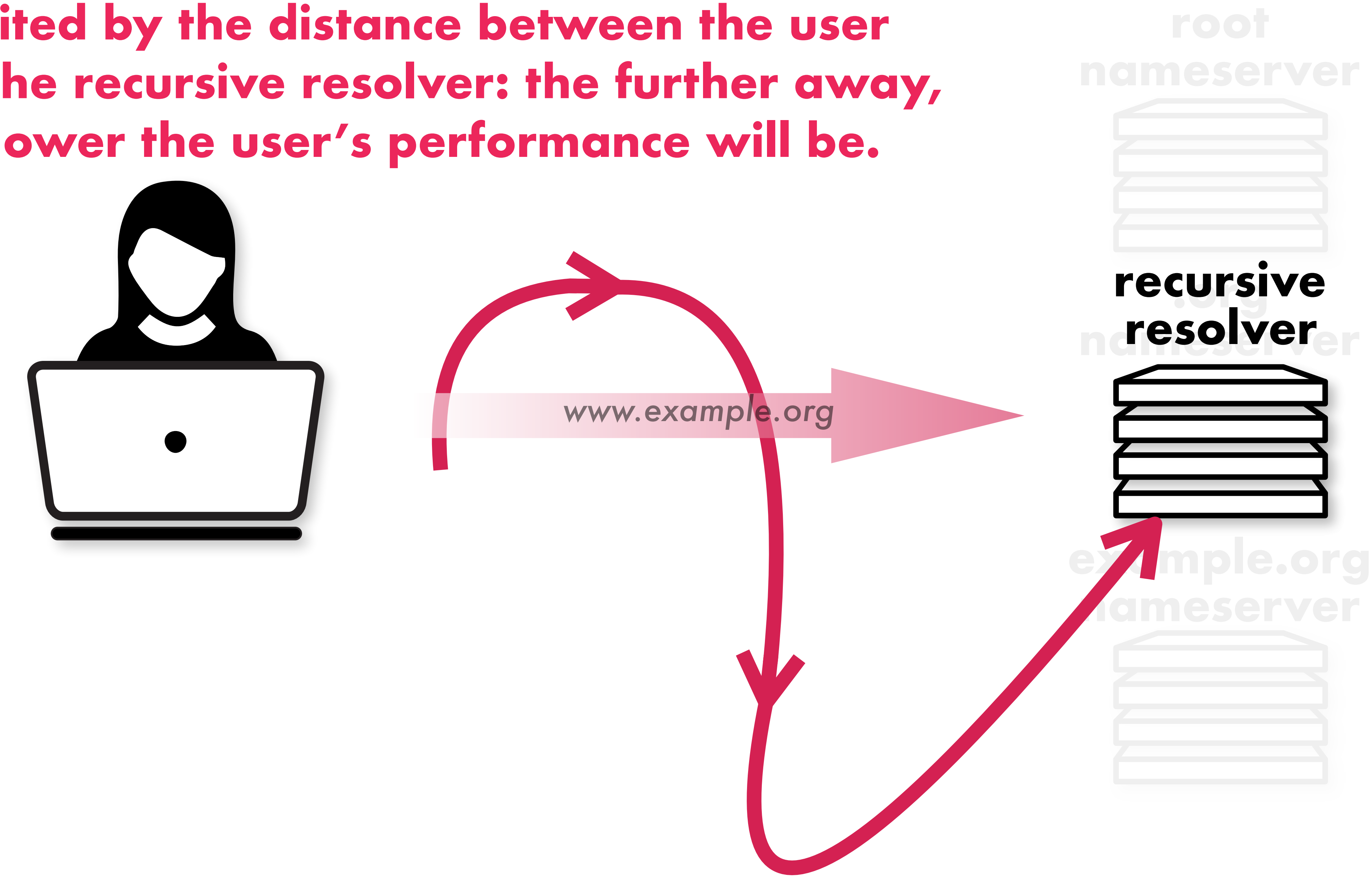
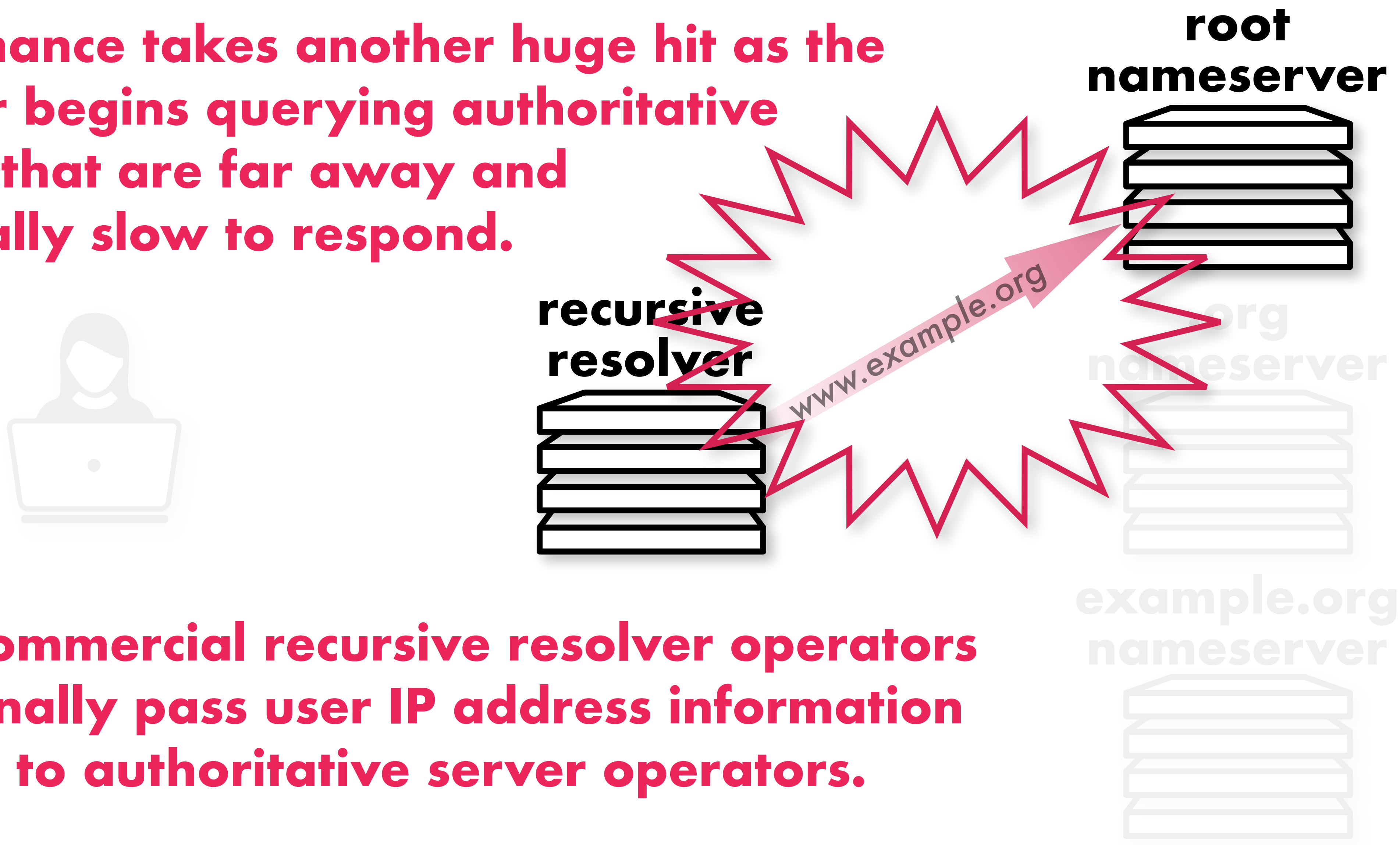
The maximum performance a user can receive is limited by the distance between the user and the recursive resolver: the further away, the slower the user's performance will be.



So What are the Problems with this System?

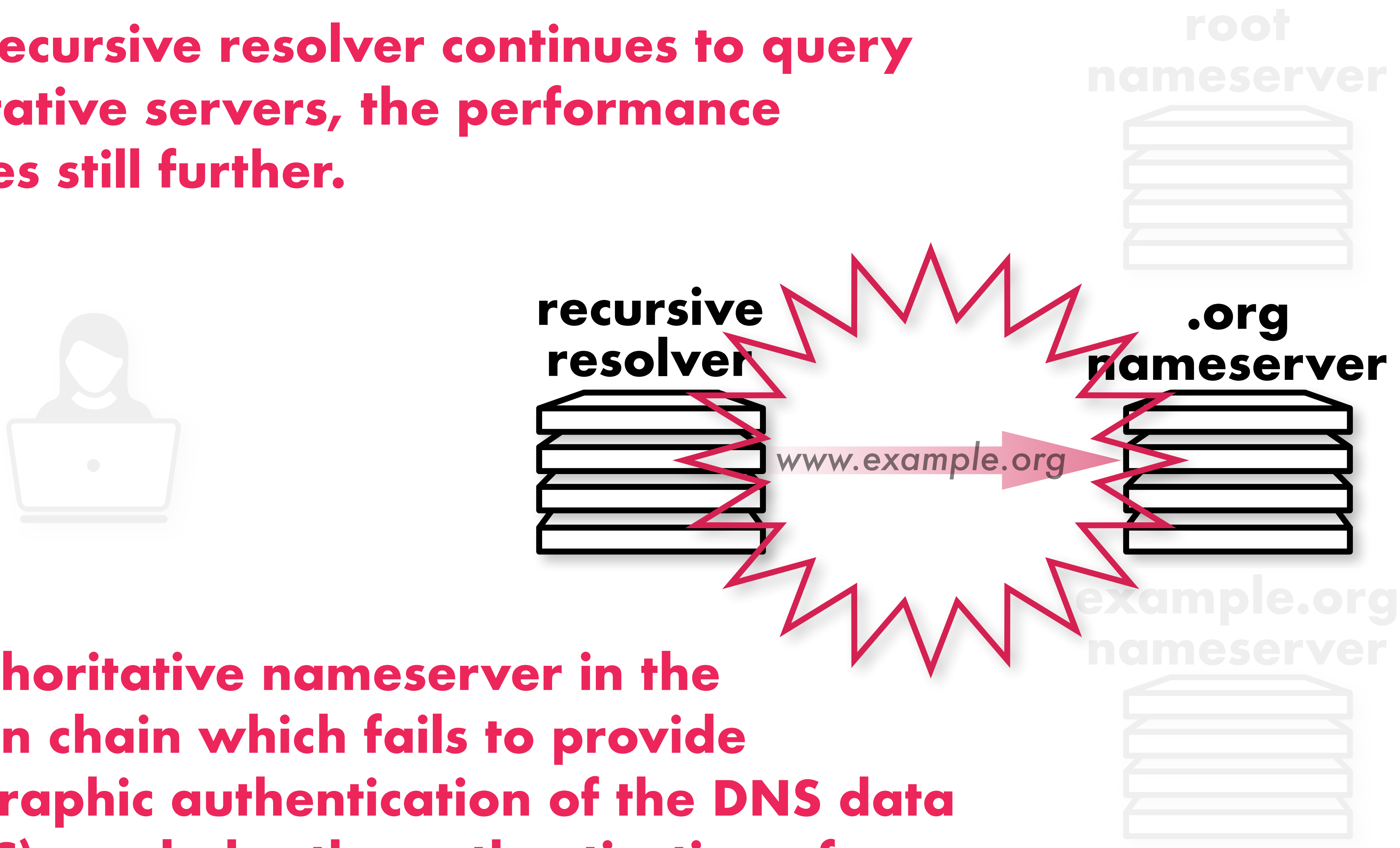
When a recursive resolver has a "cache miss" performance takes another huge hit as the resolver begins querying authoritative servers that are far away and potentially slow to respond.



Many commercial recursive resolver operators intentionally pass user IP address information onward to authoritative server operators.

So What are the Problems with this System?

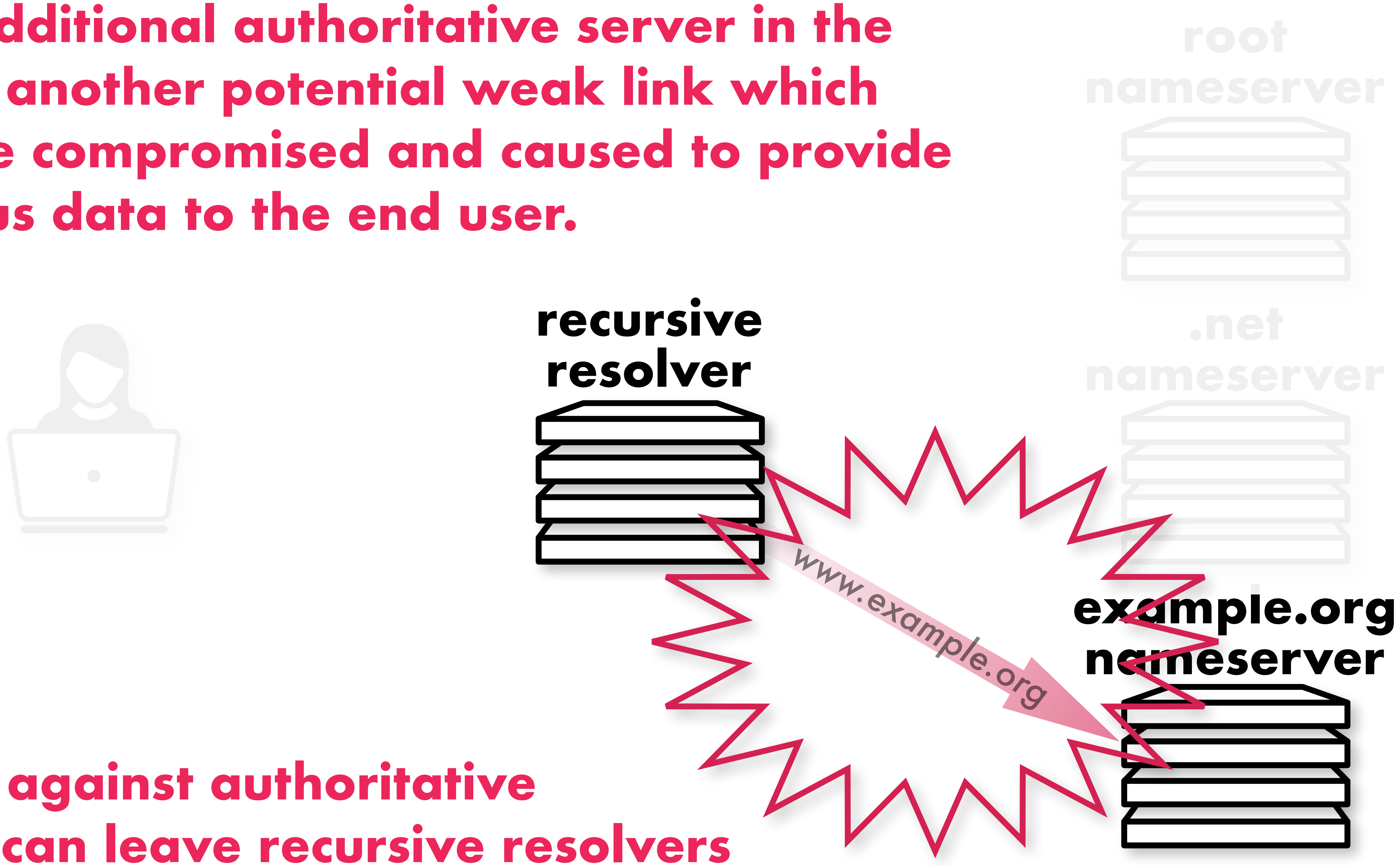
As the recursive resolver continues to query authoritative servers, the performance degrades still further.



Any authoritative nameserver in the recursion chain which fails to provide cryptographic authentication of the DNS data (DNSSEC) precludes the authentication of any domain names further downstream.

So What are the Problems with this System?

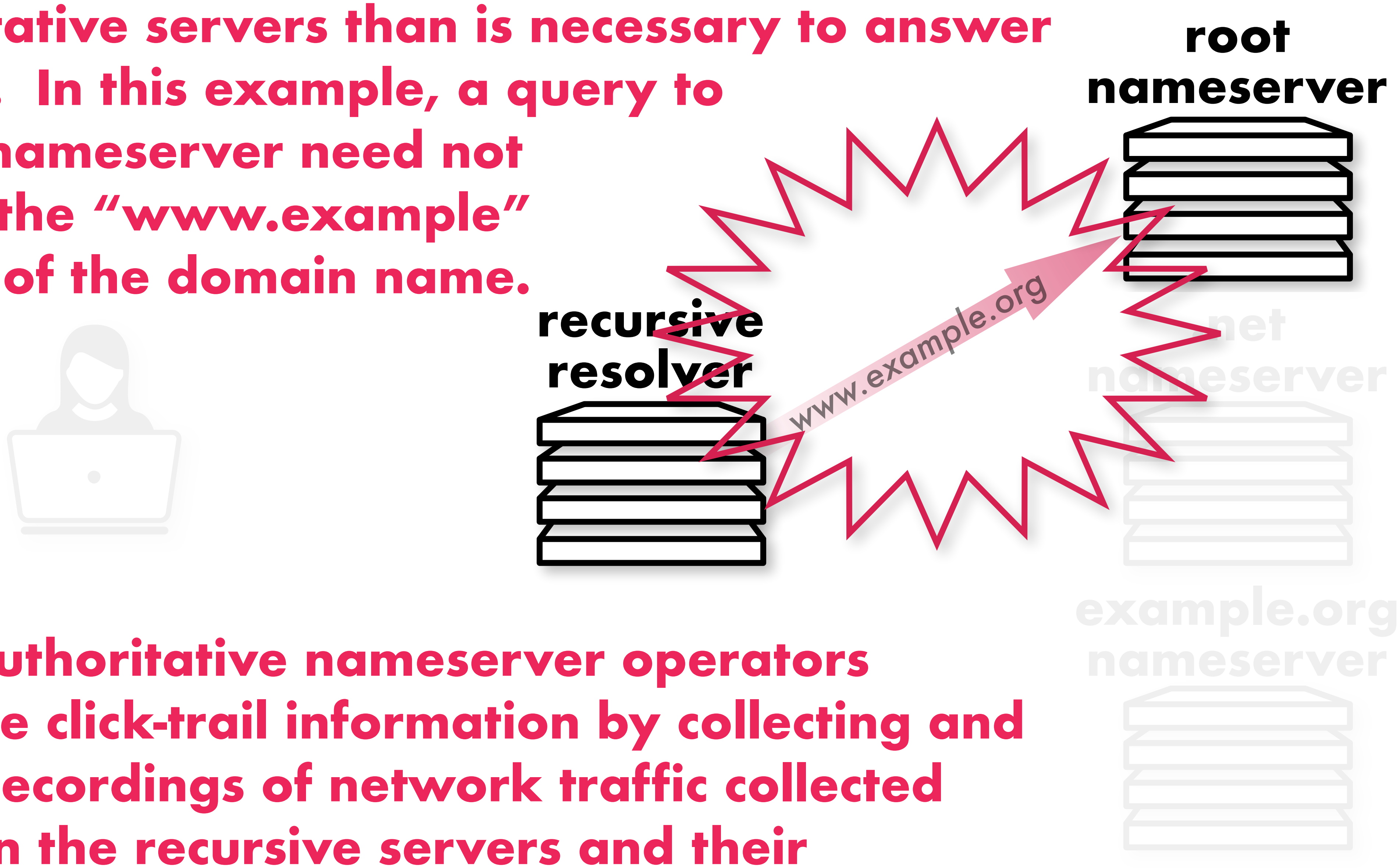
Every additional authoritative server in the chain is another potential weak link which could be compromised and caused to provide malicious data to the end user.



Attacks against authoritative servers can leave recursive resolvers unable to obtain answers on users' behalf.

So What are the Problems with this System?

Recursive resolvers leak far more information to authoritative servers than is necessary to answer queries. In this example, a query to a Root nameserver need not include the "www.example" portion of the domain name.



Many authoritative nameserver operators monetise click-trail information by collecting and selling recordings of network traffic collected between the recursive servers and their authoritative servers.

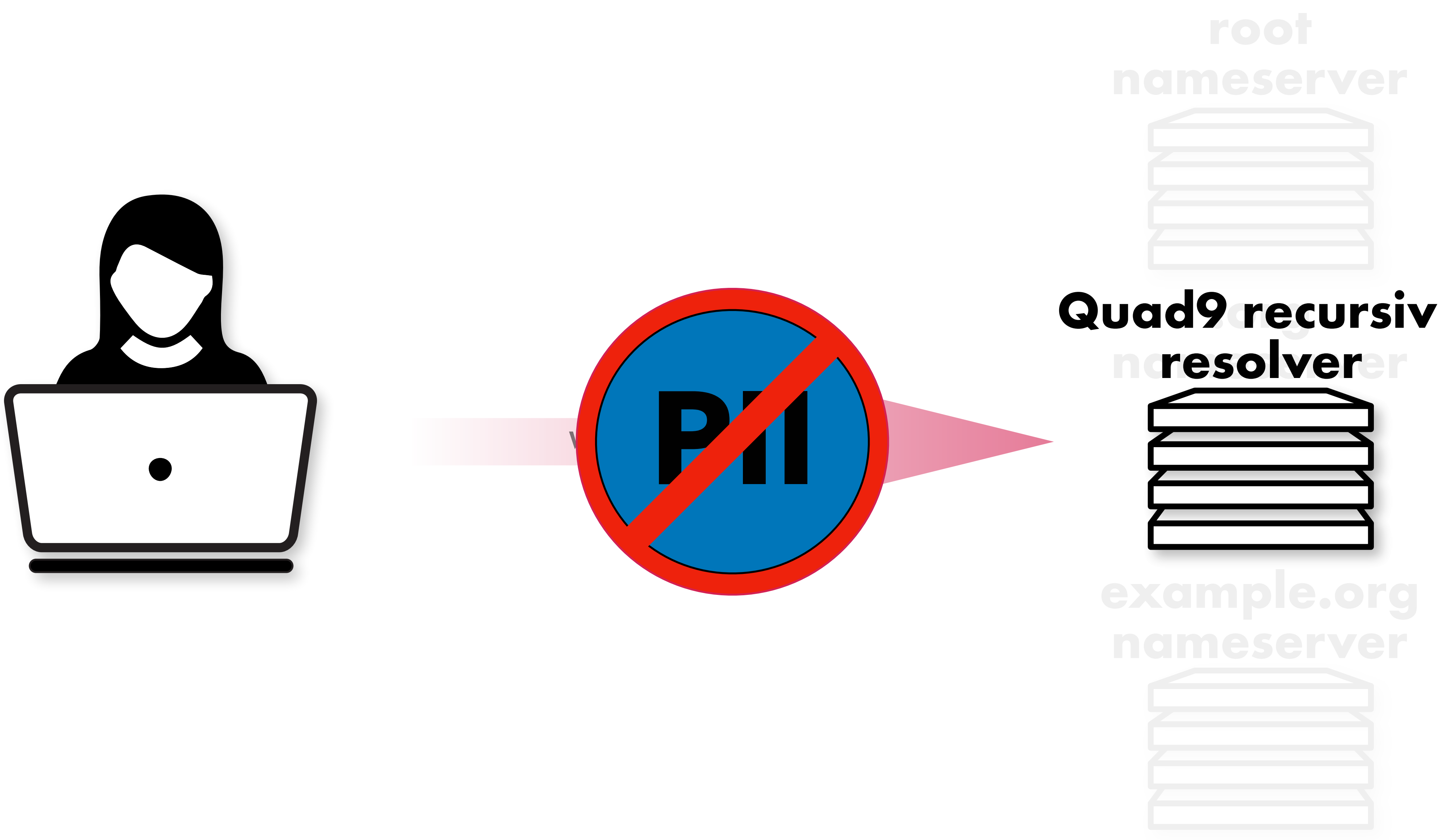
Quad9: Collaboration Between Internet Industry Leaders

IBM

GLOBAL CYBER ALLIANCE

PCH
Packet Clearing House

How does Quad9 protect you?



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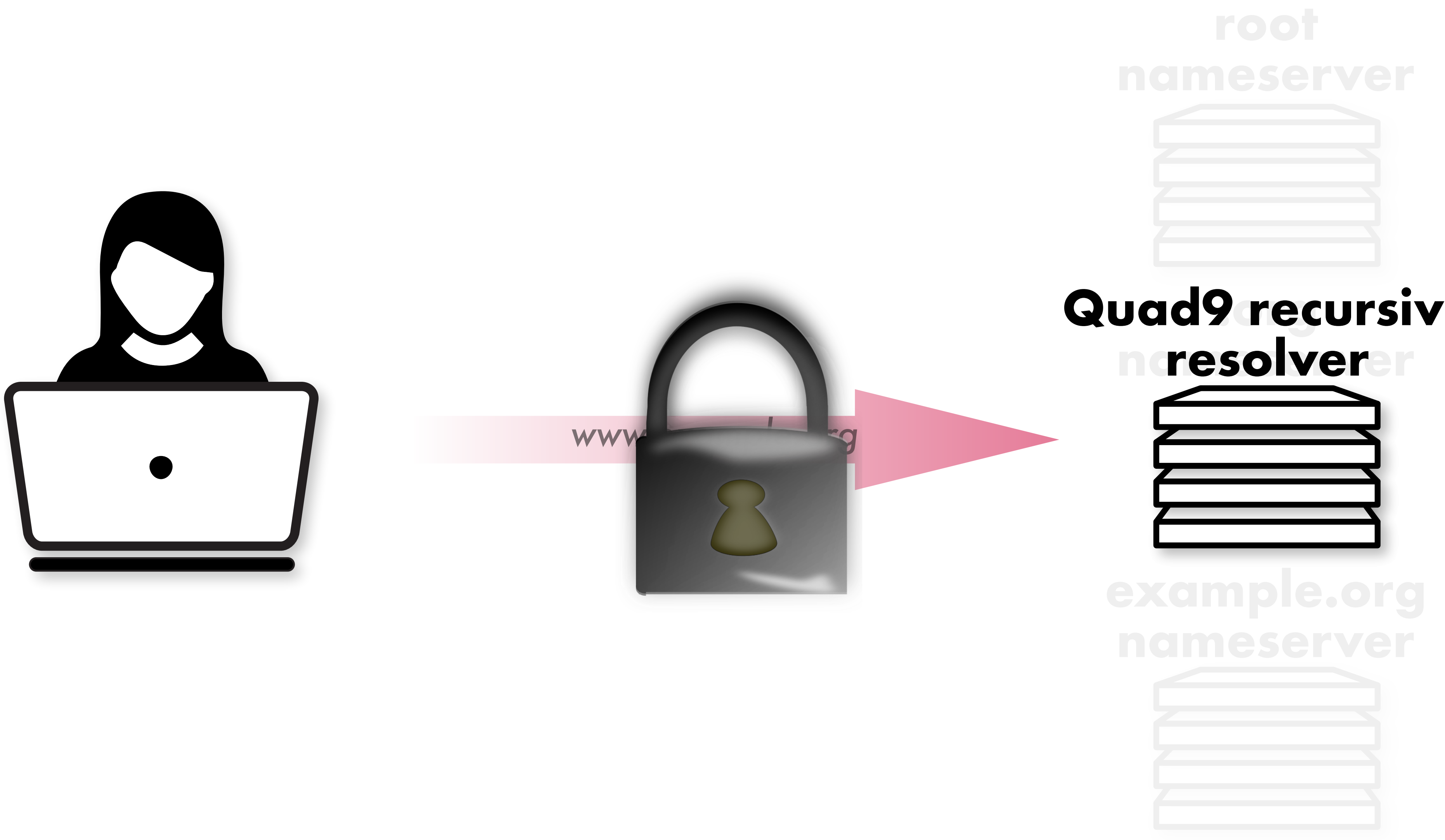

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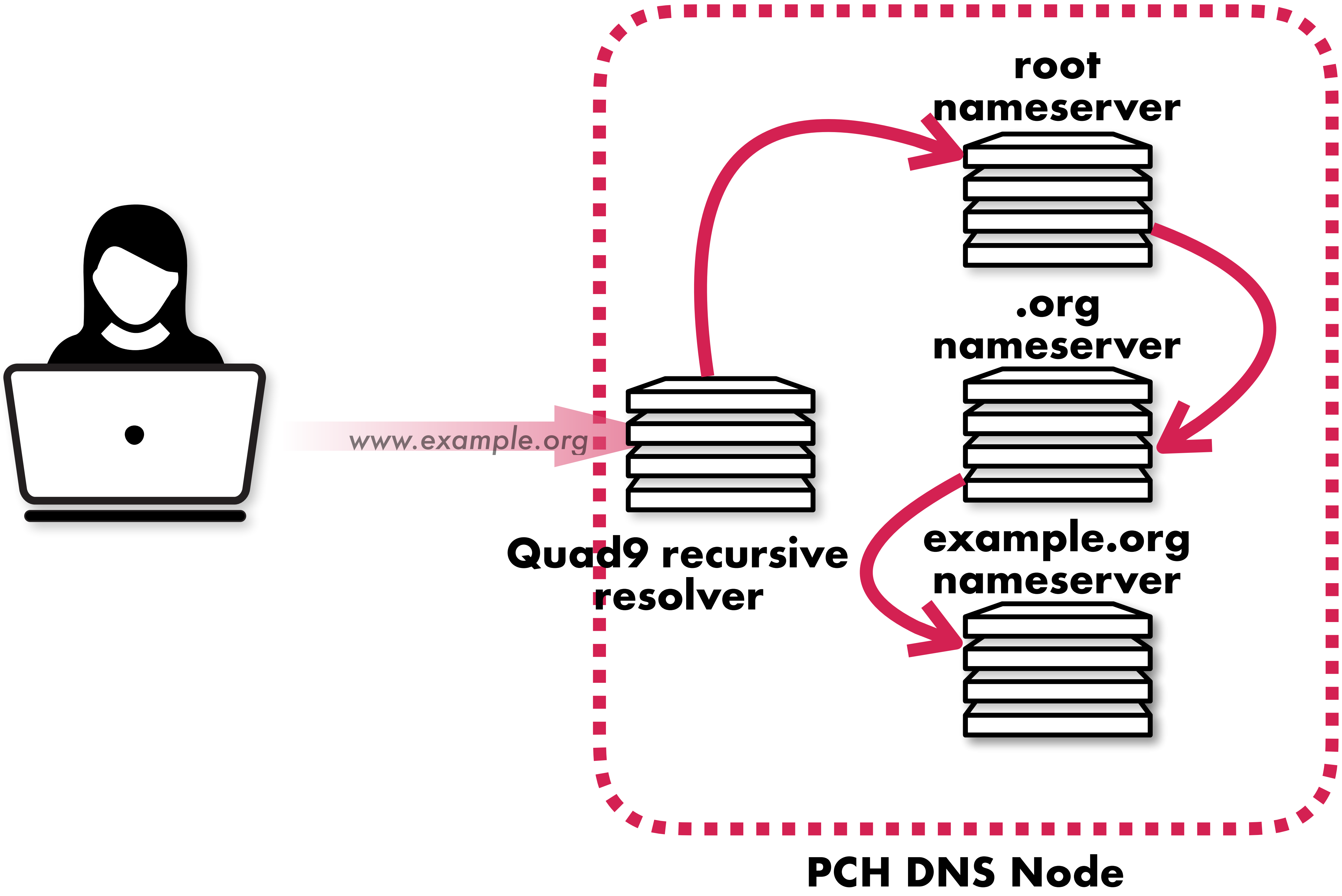

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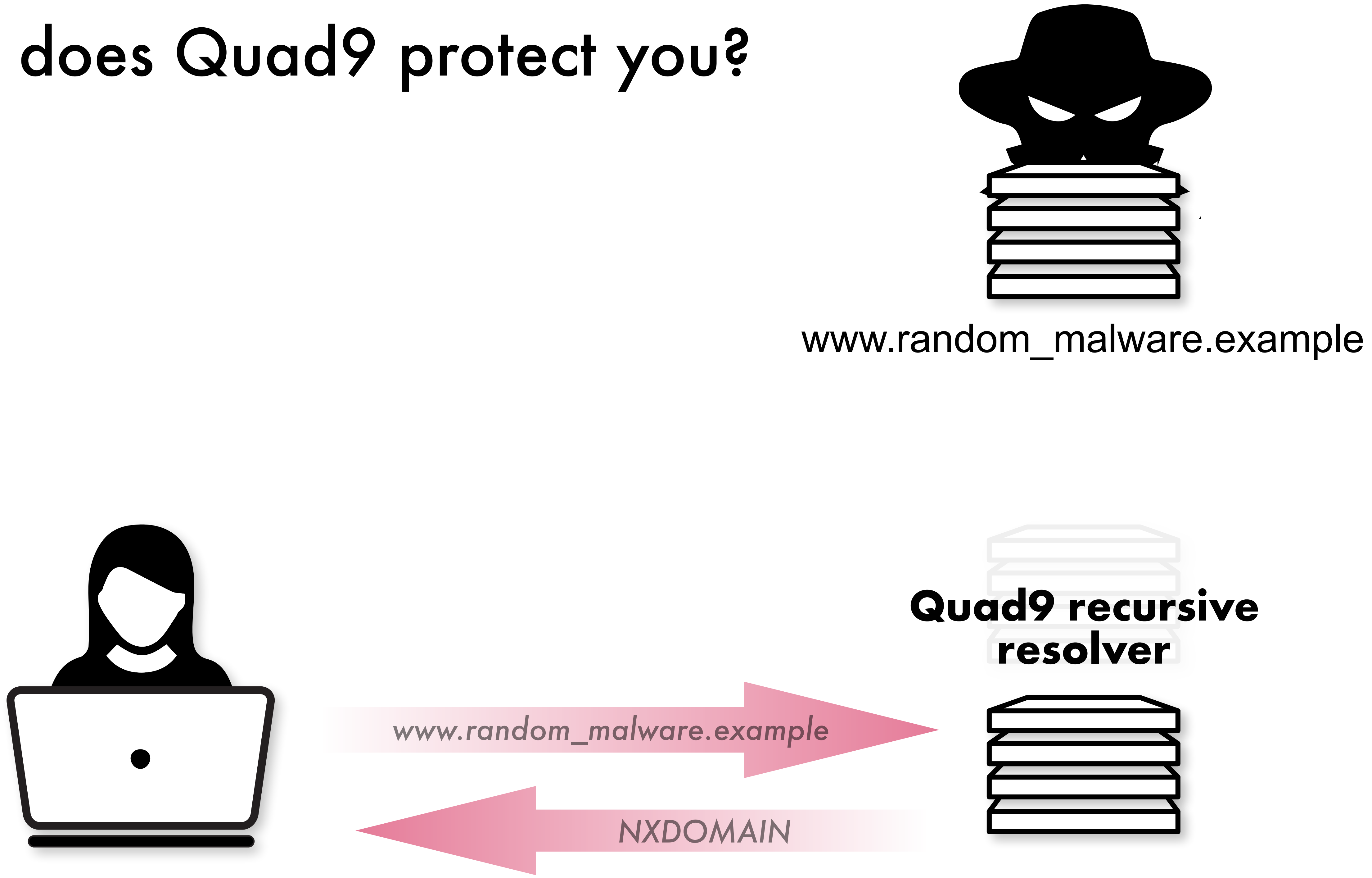
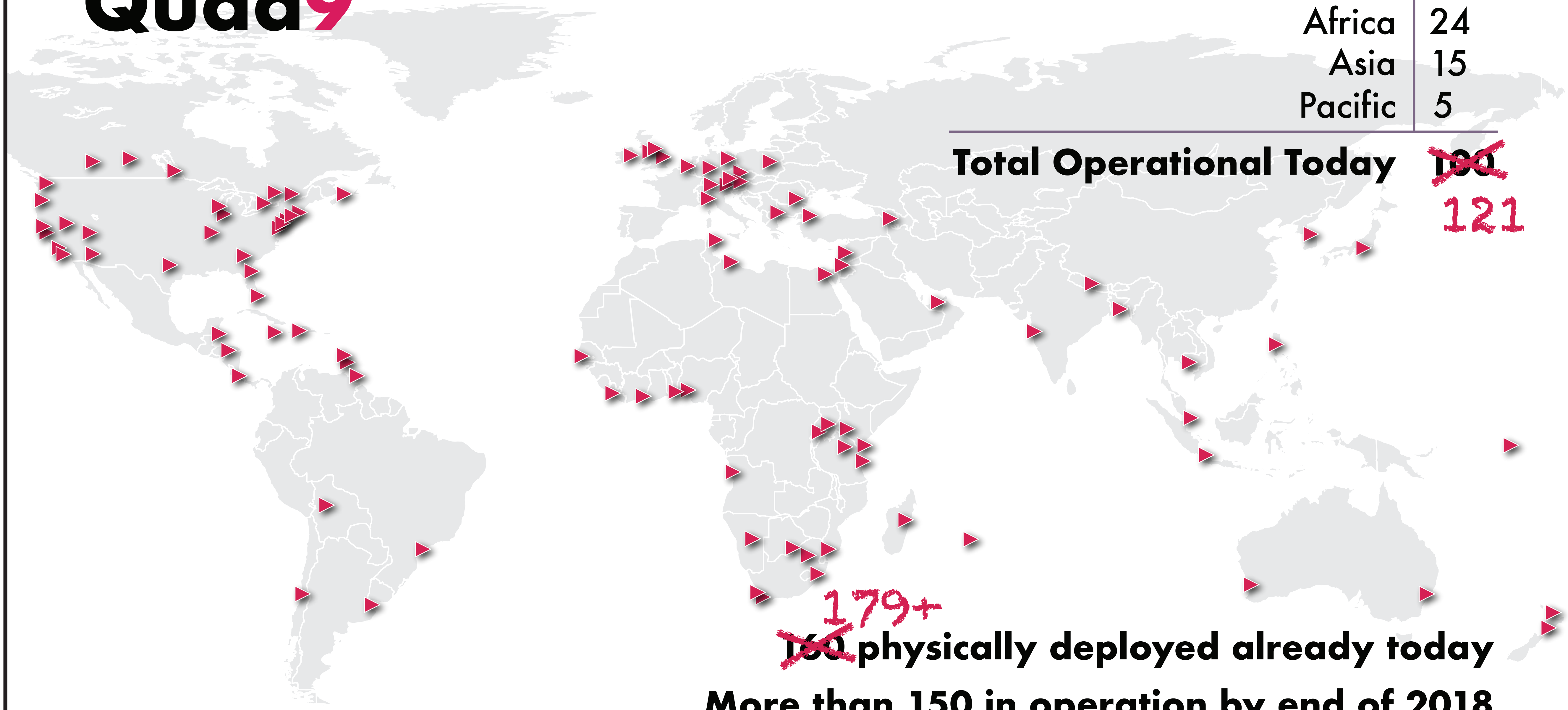


on average Quad9 “blocks” 2.2m malware requests daily

I ♥
NON-PROFITS

Quad9



North America	28
South America	12
Europe	16
Africa	24
Asia	15
Pacific	5
Total Operational Today	~~190~~ 121

179+

~~160~~ physically deployed already today

More than 150 in operation by end of 2018

Quad9

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2620:fe::fe

www.quad9.net