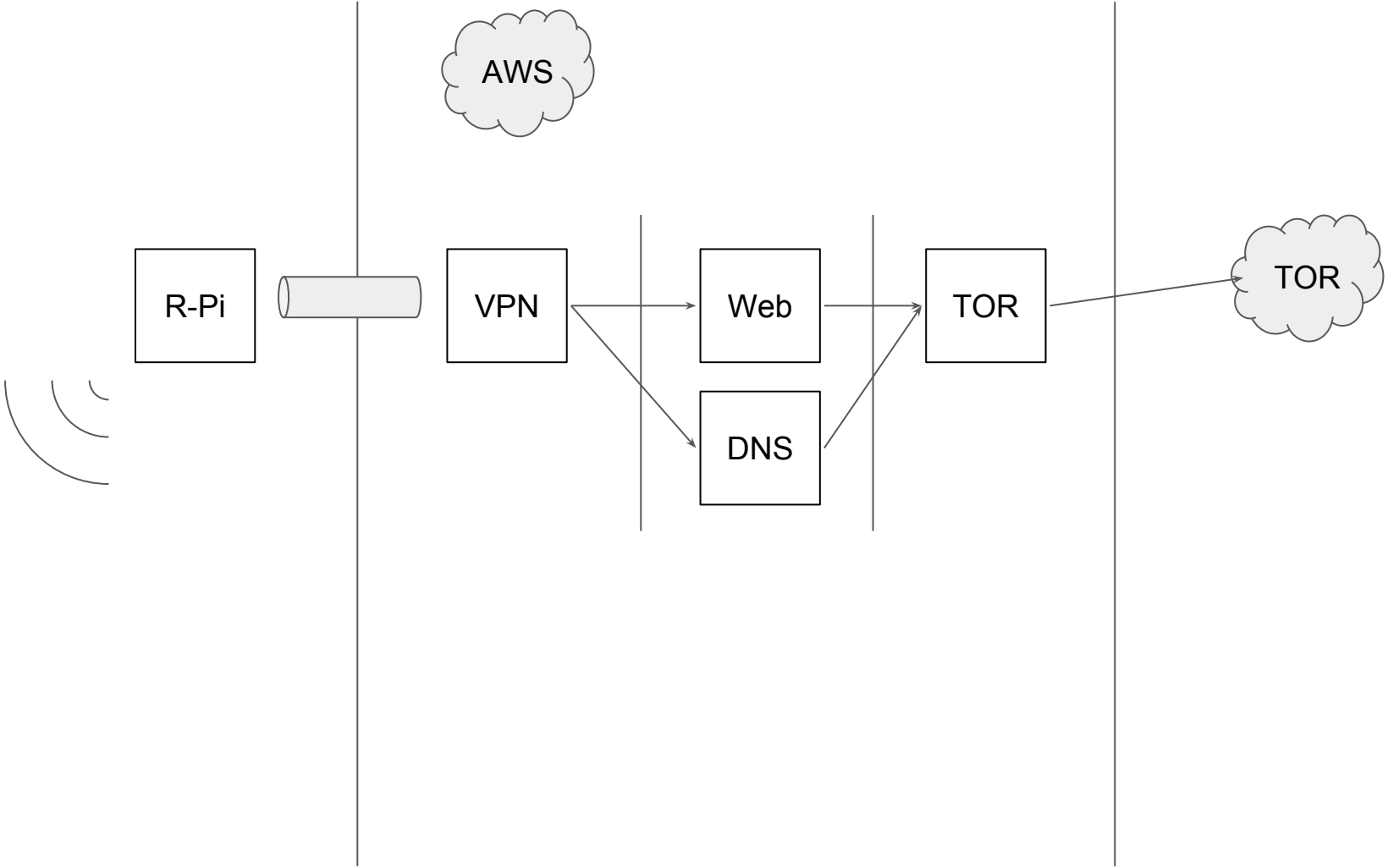
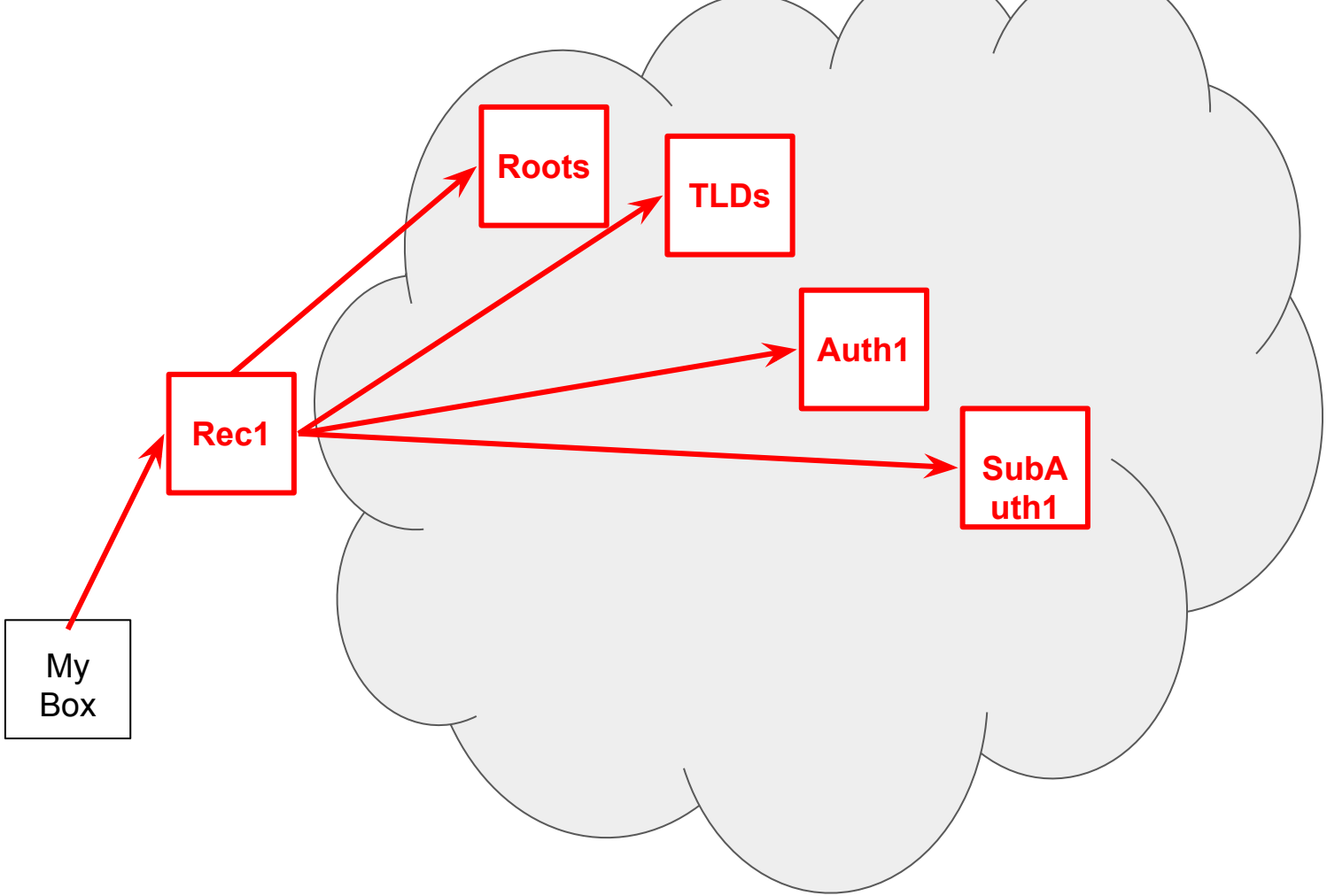
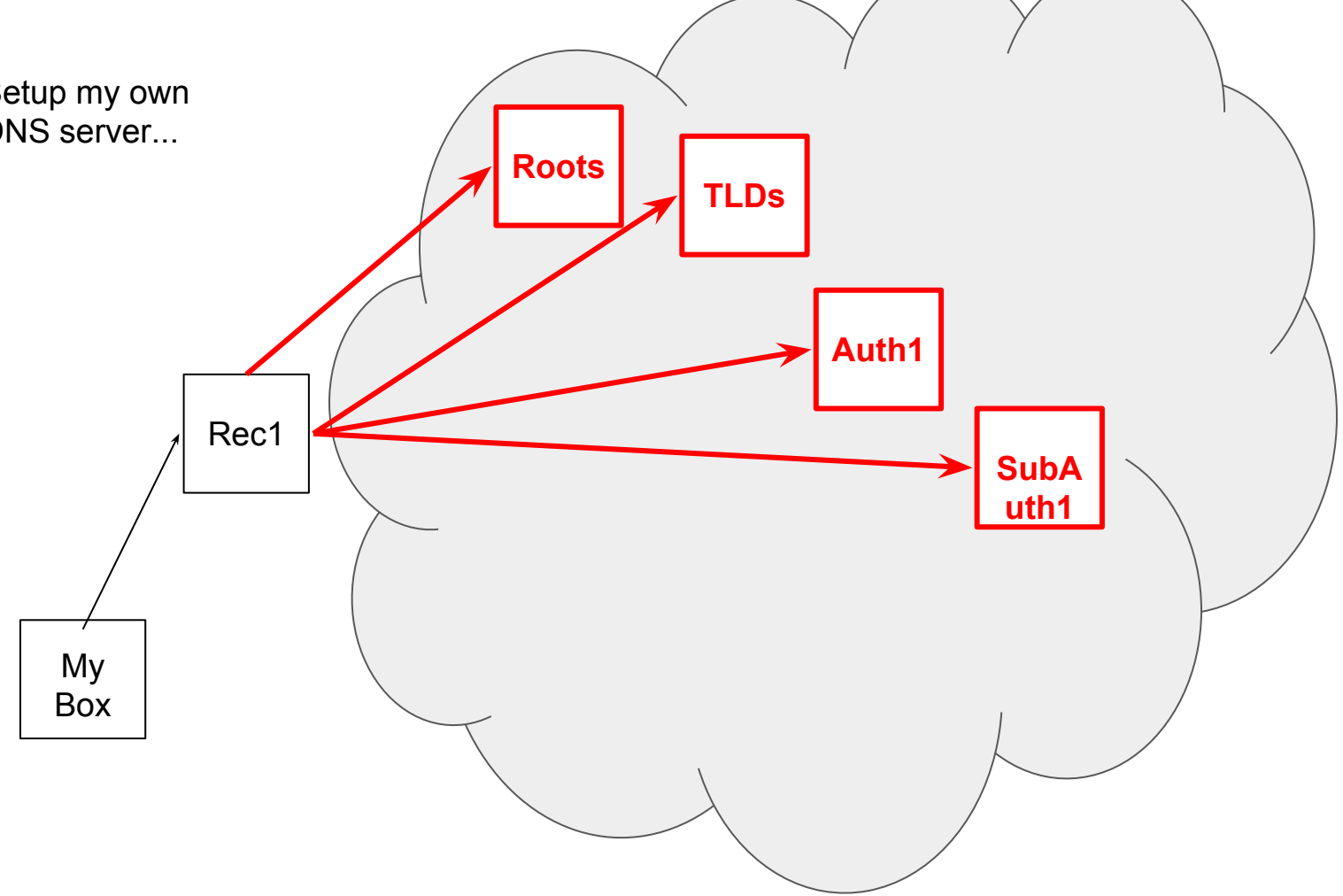
Home Internet Security

Supersize my security, please

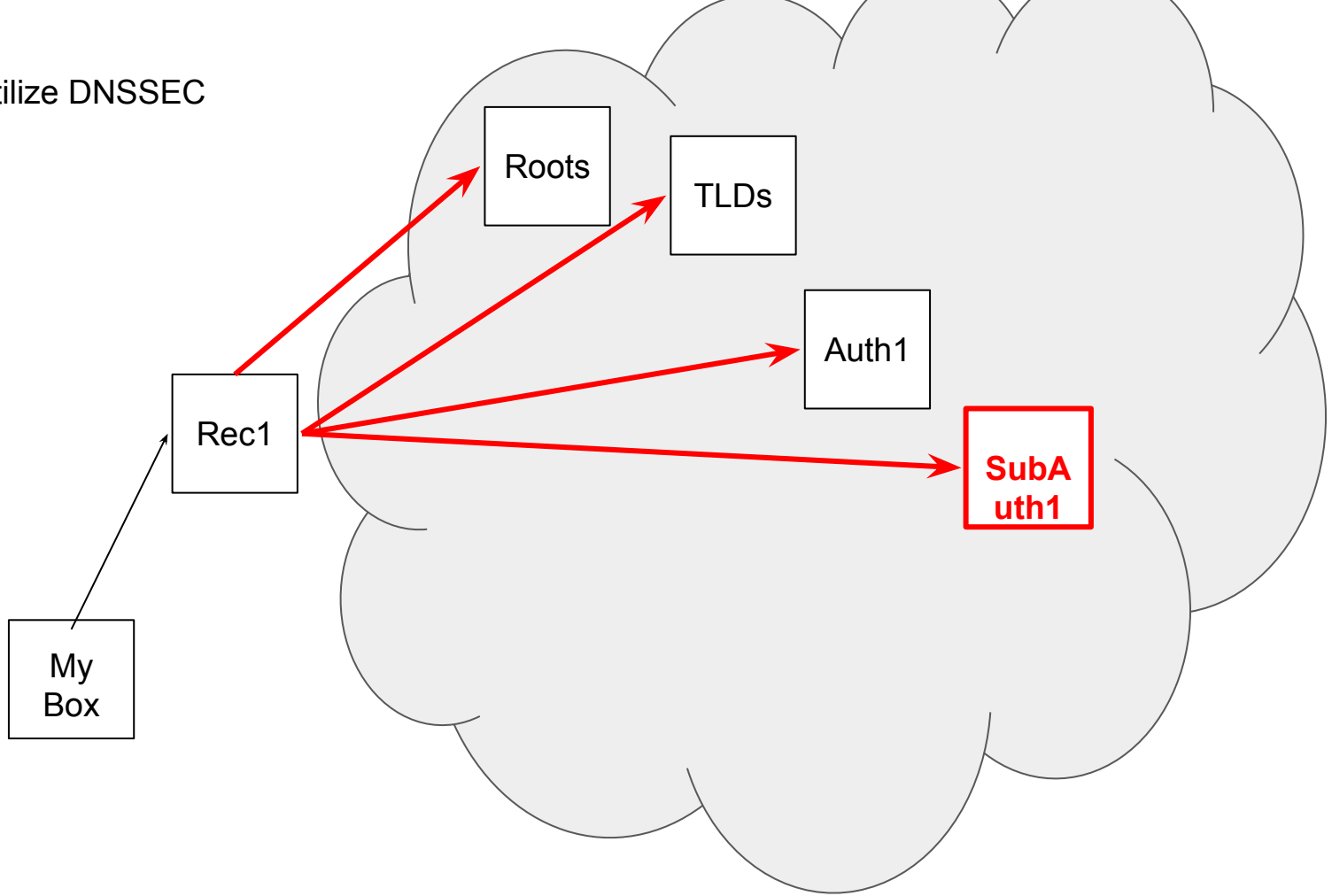

AWS
R-Pi
VPN
Web
DNS
TOR
TOR


Roots
TLDs
Auth1
Rec1
SubA
uth1
My
Box

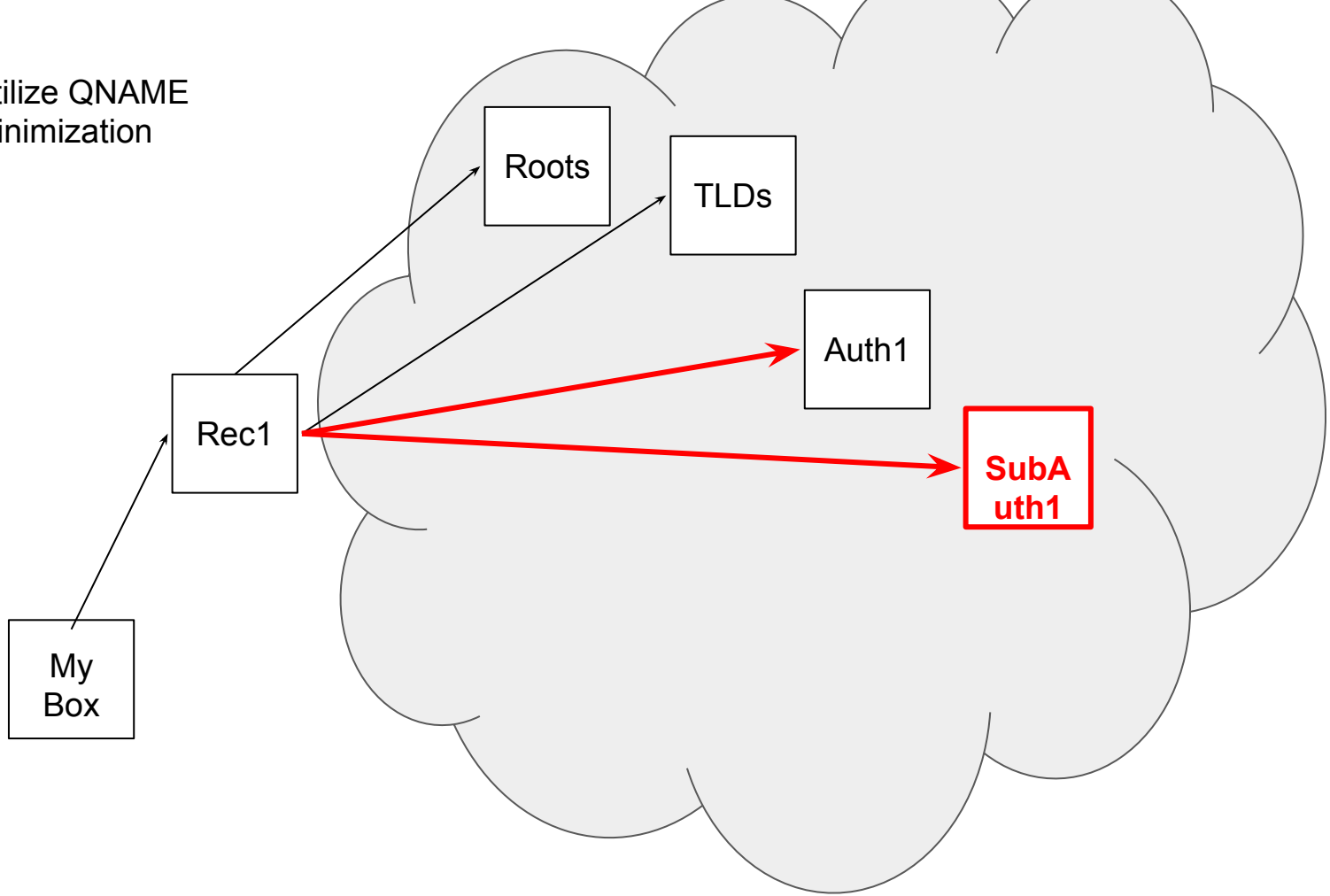
Setup my own
DNS server...



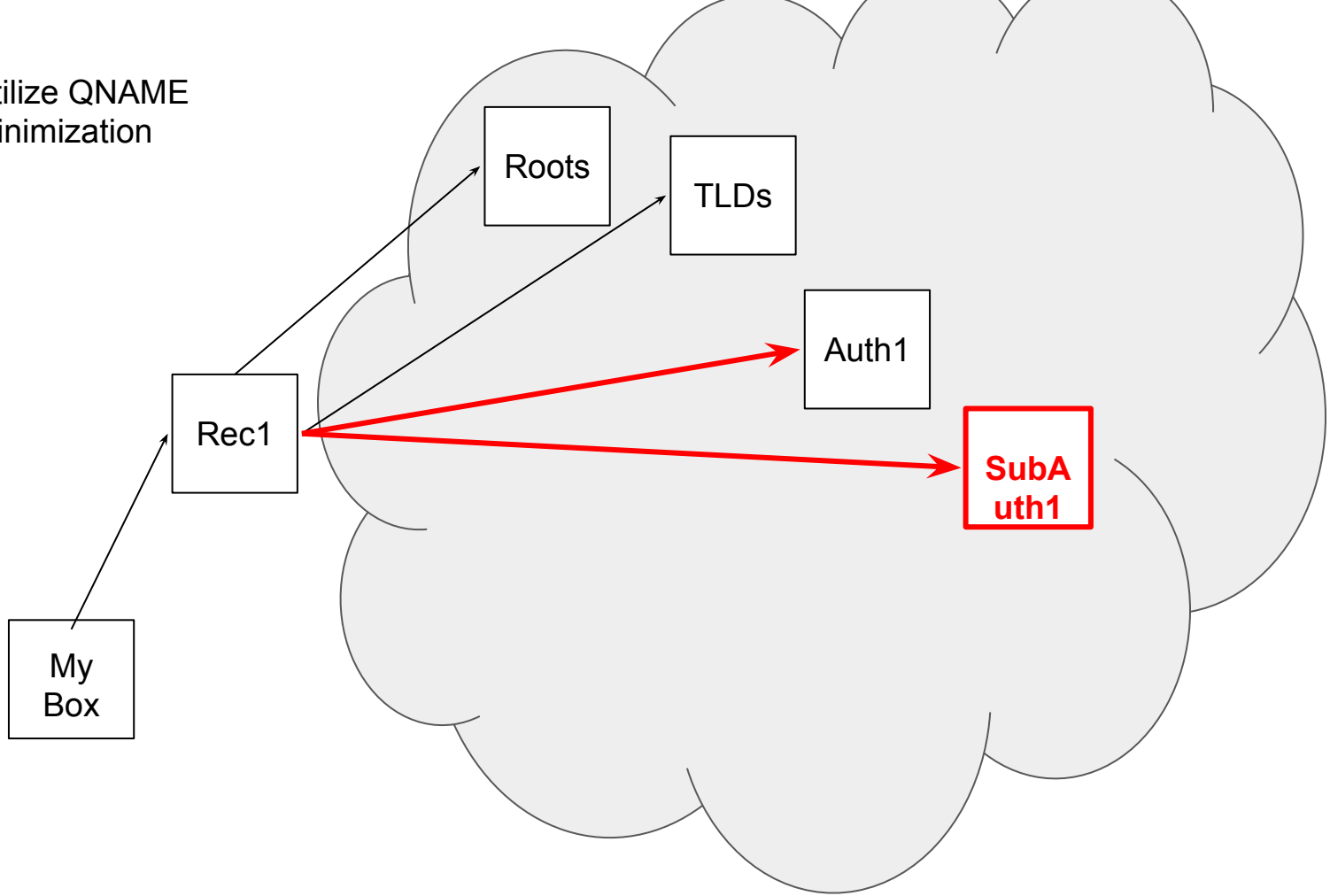
Utilize DNSSEC



Utilize QNAME minimization



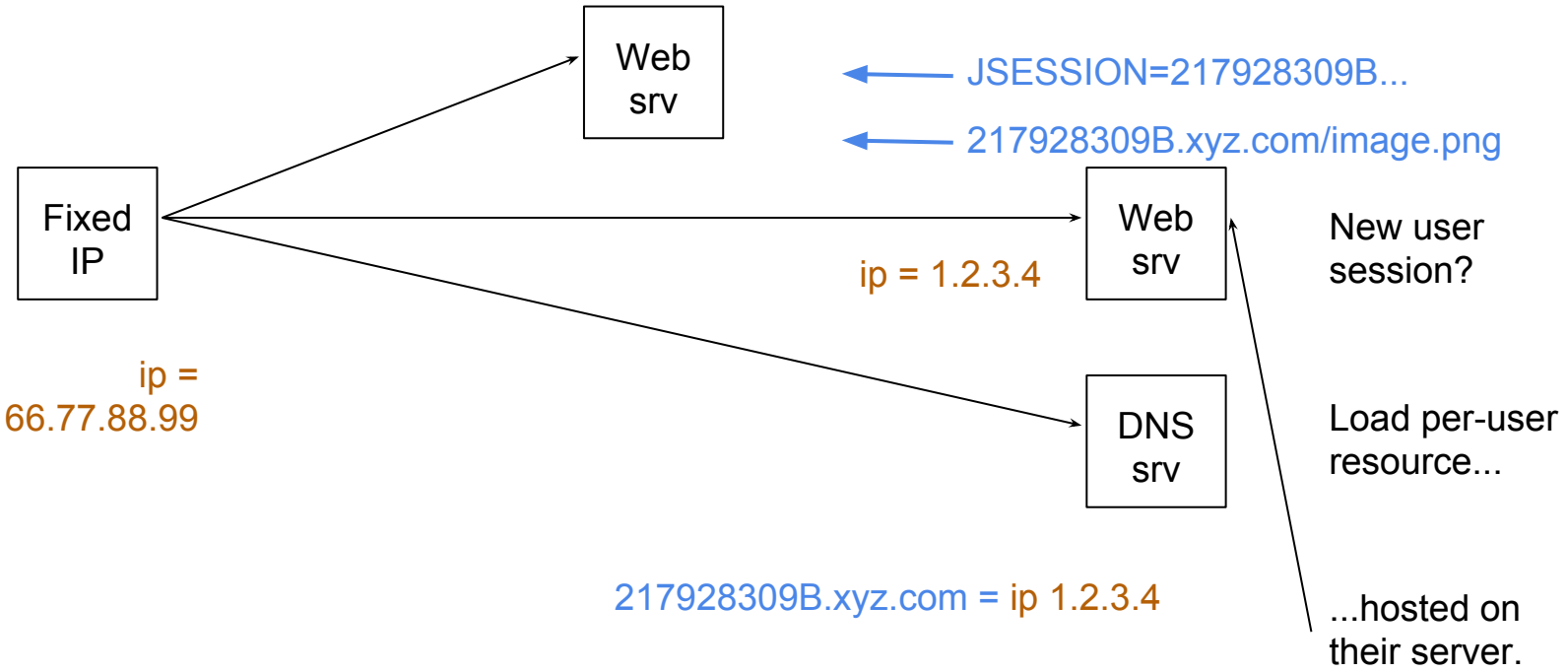
Utilize QNAME minimization



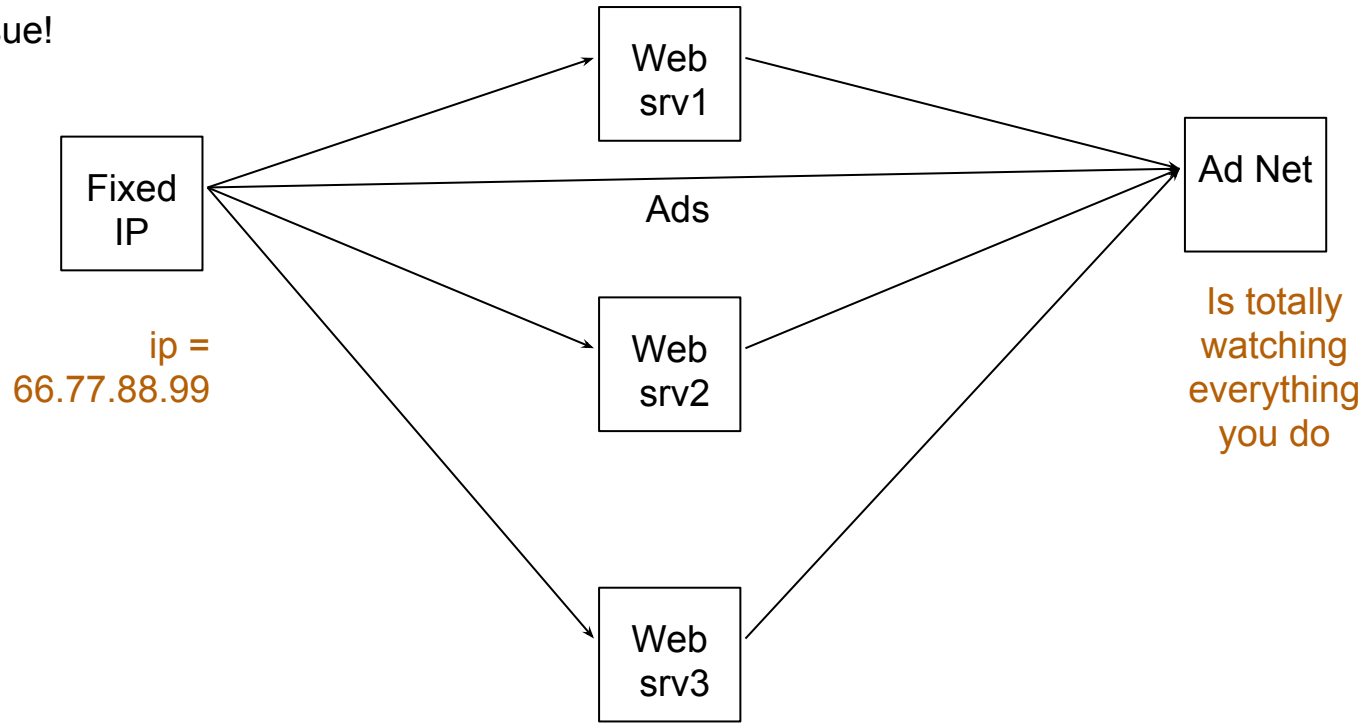
Ad Network = Surveillance

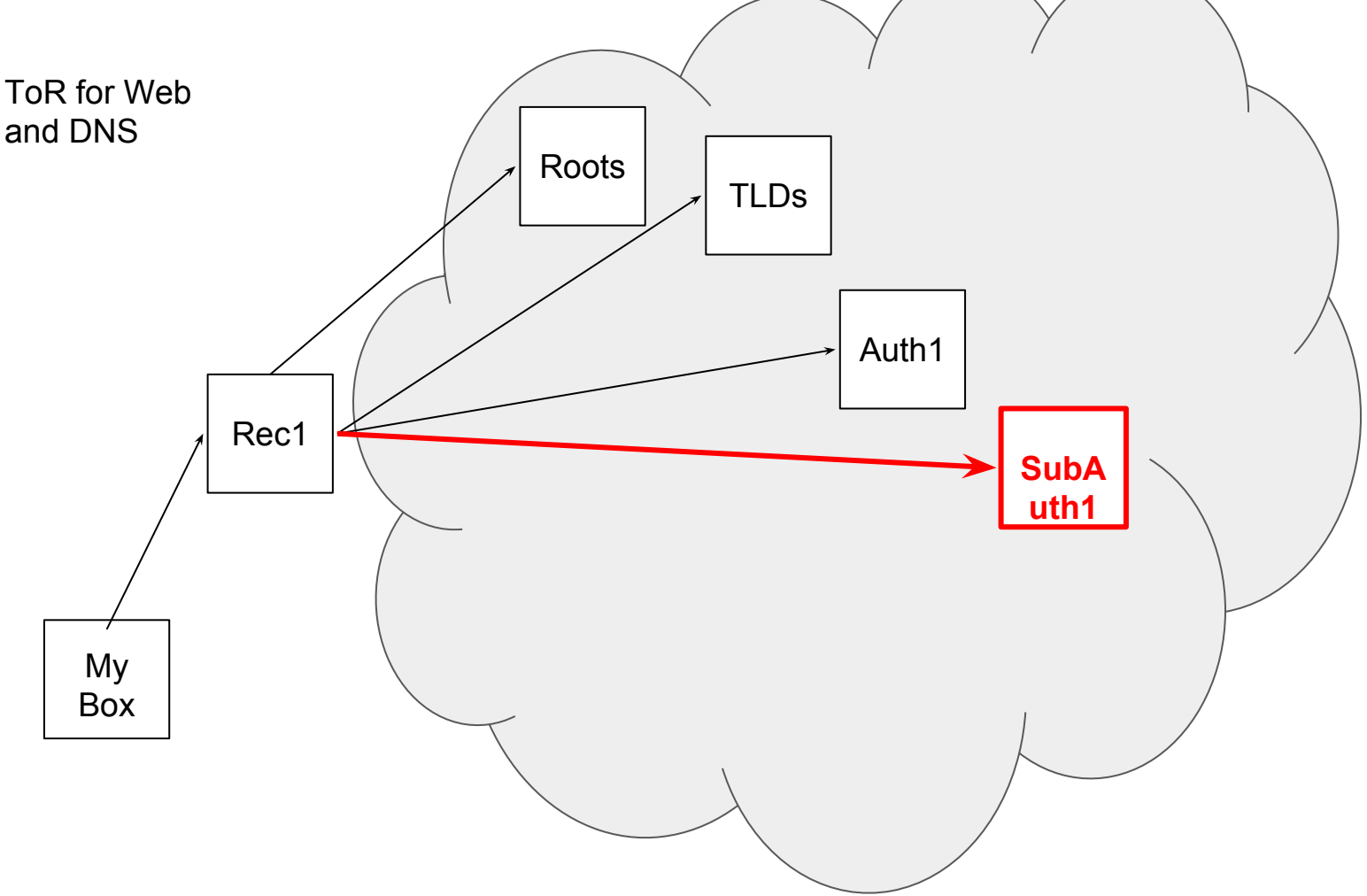
Random website With ads:

Example Ad Network:



Fixed IP is an issue!

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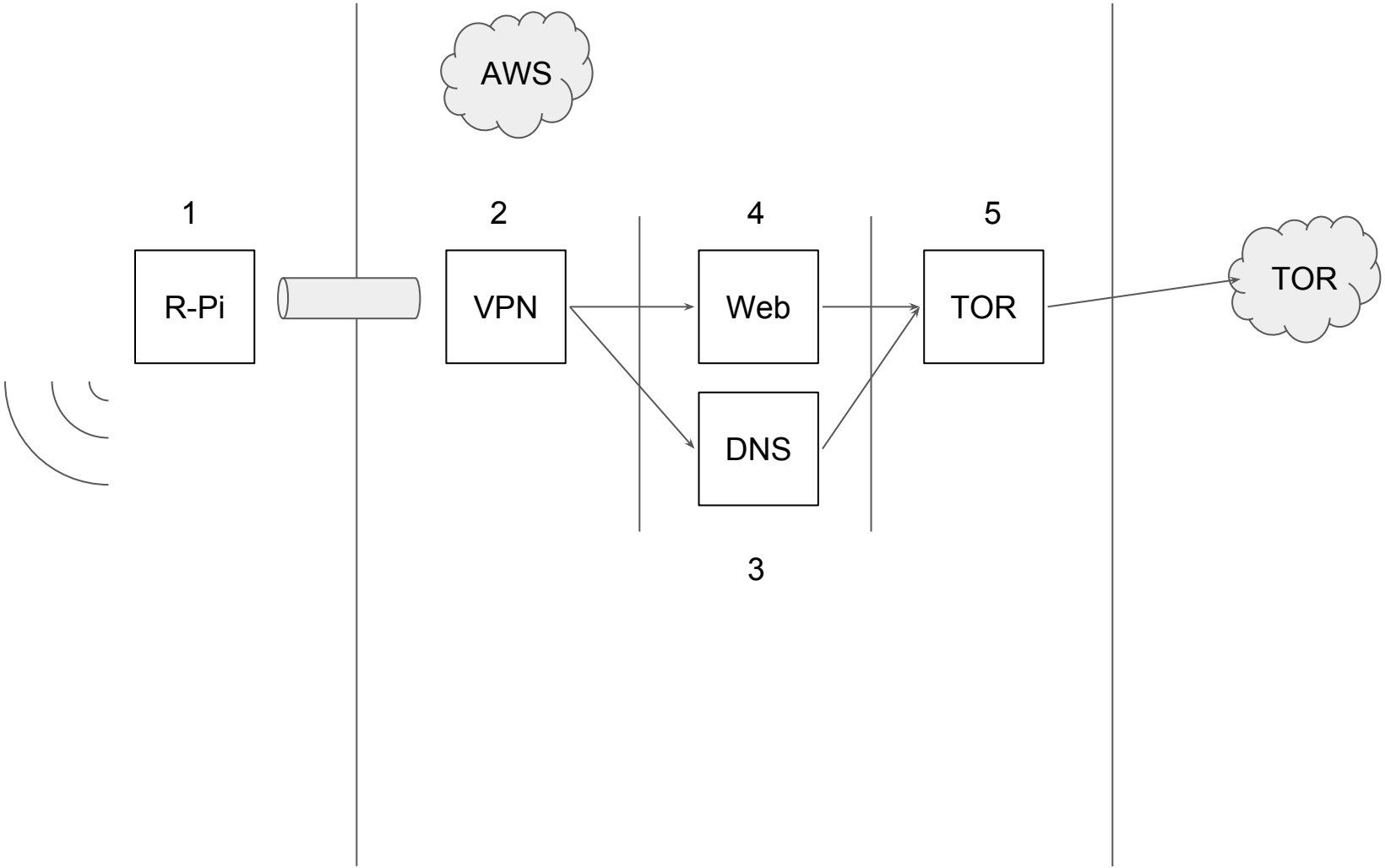
AWS
1
2
4
5
R-Pi
VPN
Web
TOR
TOR
DNS
3

Step 1: R-Pi WiFi + DHCP + VPN

Small gap between my network traffic and VPN

Control of what traffic is pulled out of the VPN

- To ISP
- To Netflix

Step 2: R-Pi VPN -> AWS VPN

Why?

I don’t want my ISP to see my stuff. I know they’re trying to look. I can at least make it hard to do.

“Local” traffic can be pulled out of VPN (traffic to my ISP, traffic to Netflix, etc.)

Step 3: Use my own DNS server

Why?

Can actually get DNSSEC replies (otherwise they could be stripped...subverted)

With DNS-over-TLS support (encrypted queries)

Encrypt my DNS, so folks can’t spy on me.

With QNAME minimization support

So that I don’t “give away” where I’m browsing.

Step 4: Web Security in AWS

Review all web traffic dynamically in AWS

Why?

I can’t run that at my home location - not enough electrical outlets!

Step 5:ToR my web traffic in the cloud

Why?

> I don’t want random sites mining my data.

> This thwarts / slows active adversaries trying to track me

Step 5: Pump DNS through ToR

So that individual queries aren’t “erupting” from my DNS server, but are “spread” across >50,000 possible IPs.

Future directions

- Non-AWS instructions
- DNS, HTTPS inspection + security
- “Pinned apps” list of consumer apps

AWS? Other providers???

Surely!

Digital Ocean and Linode are cheapest ($5/month per instance, prob. 3 inst.)

AWS is next, followed closely by Azure

Google Cloud is incompetent

Cloud prices

Provider	Instance cost	Network traffic		
		50 GB	200 GB	1 TB
Digital Ocean	$5	--	--	included
Linode	$5	--	--	included
AWS	$4.88	+$4.50	+$18.00	+$90.00
Azure	$13.14	+$4.32	+$17.30	+$86.50
Google cloud	$3.88	+$6.00	+$24.00	+$120