



# Everything about DNS you never dared to ask!

**dnsimple**

Automating domain management since 2010

ole@dnsimple.com





# I am Ole





# Are you hungry but just ate?





**Pizza**  
+  
**Chocolate**



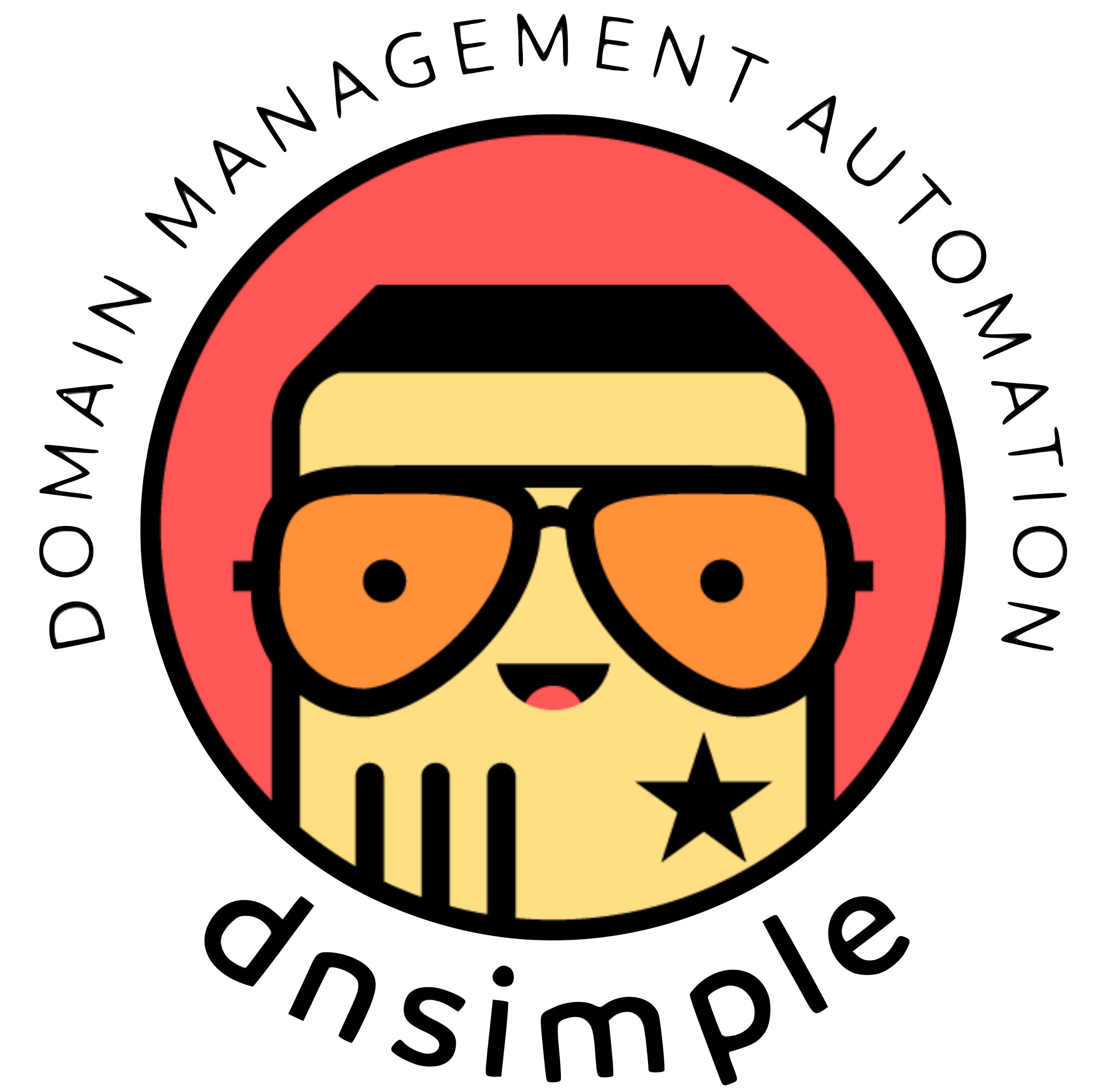
# Frozen chocolate pizza



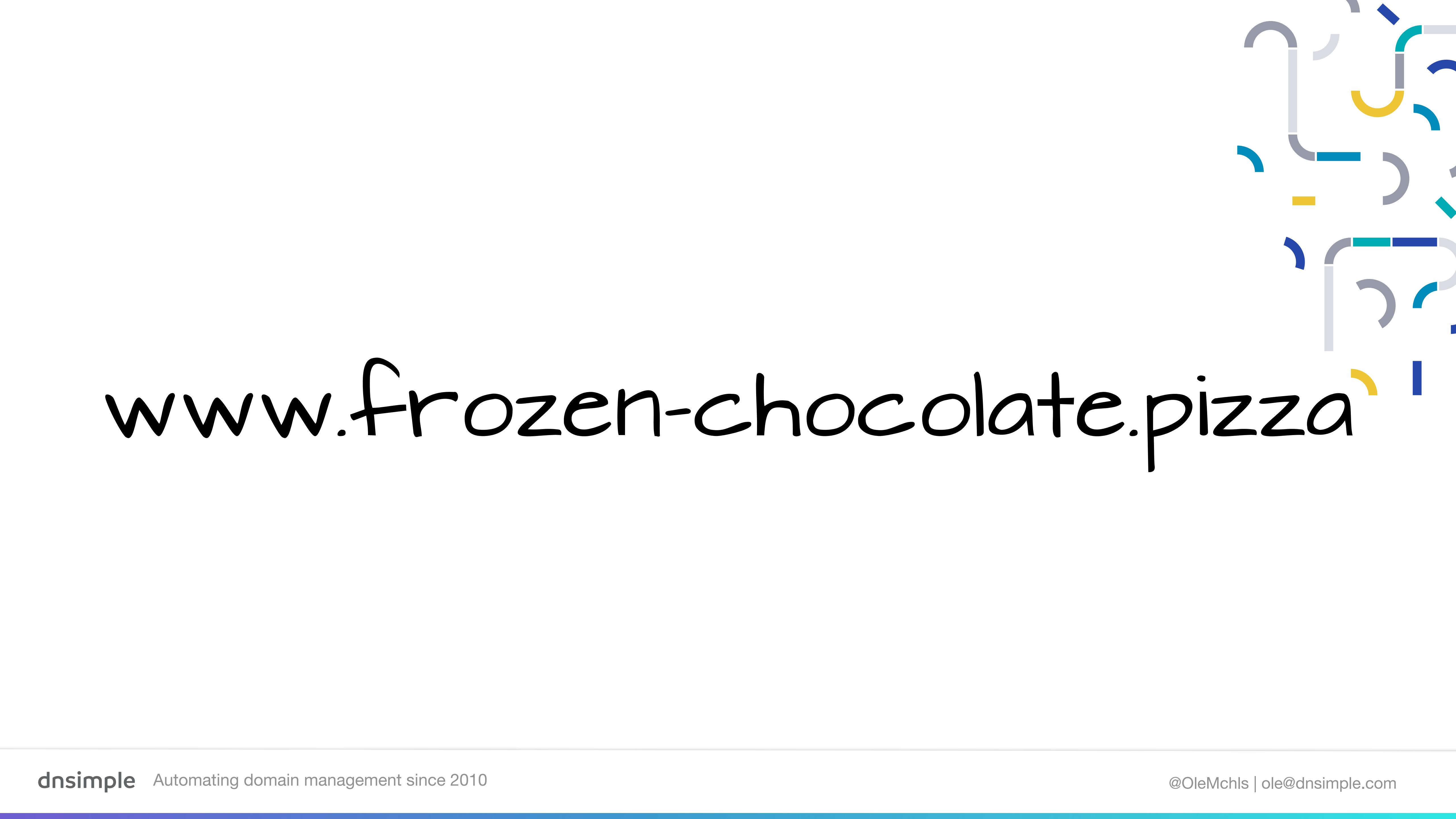




# We need a domain!







www.frozen-chocolate.pizza





# Registrant Registrar



# Registrar Registry





Extensible Provisioning Protocol

# Extensible Provisioning Protocol (EPP)

## RFC 3730



# Extensible Provisioning Protocol



## 1. Domains



- 1. Domains**
- 2. Hosts**



- 1. Domains**
- 2. Hosts**
- 3. Contacts**



# Extensible Provisioning Protocol



Extensible Provisioning Protocol

# Query & Transform Commands



# Extensible Provisioning Protocol



Extensible Provisioning Protocol

# RFC 3731 EPP Domain Name Mapping



Extensible Provisioning Protocol

# RFC 3731 EPP Domain Name Mapping

# RFC 3732 EPP Host Mapping



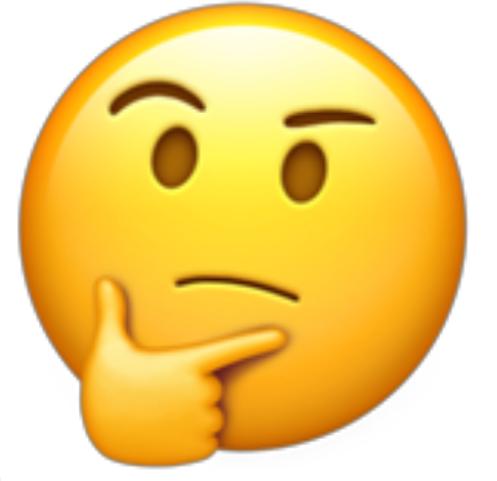
**RFC 3731 EPP Domain Name Mapping**

**RFC 3732 EPP Host Mapping**

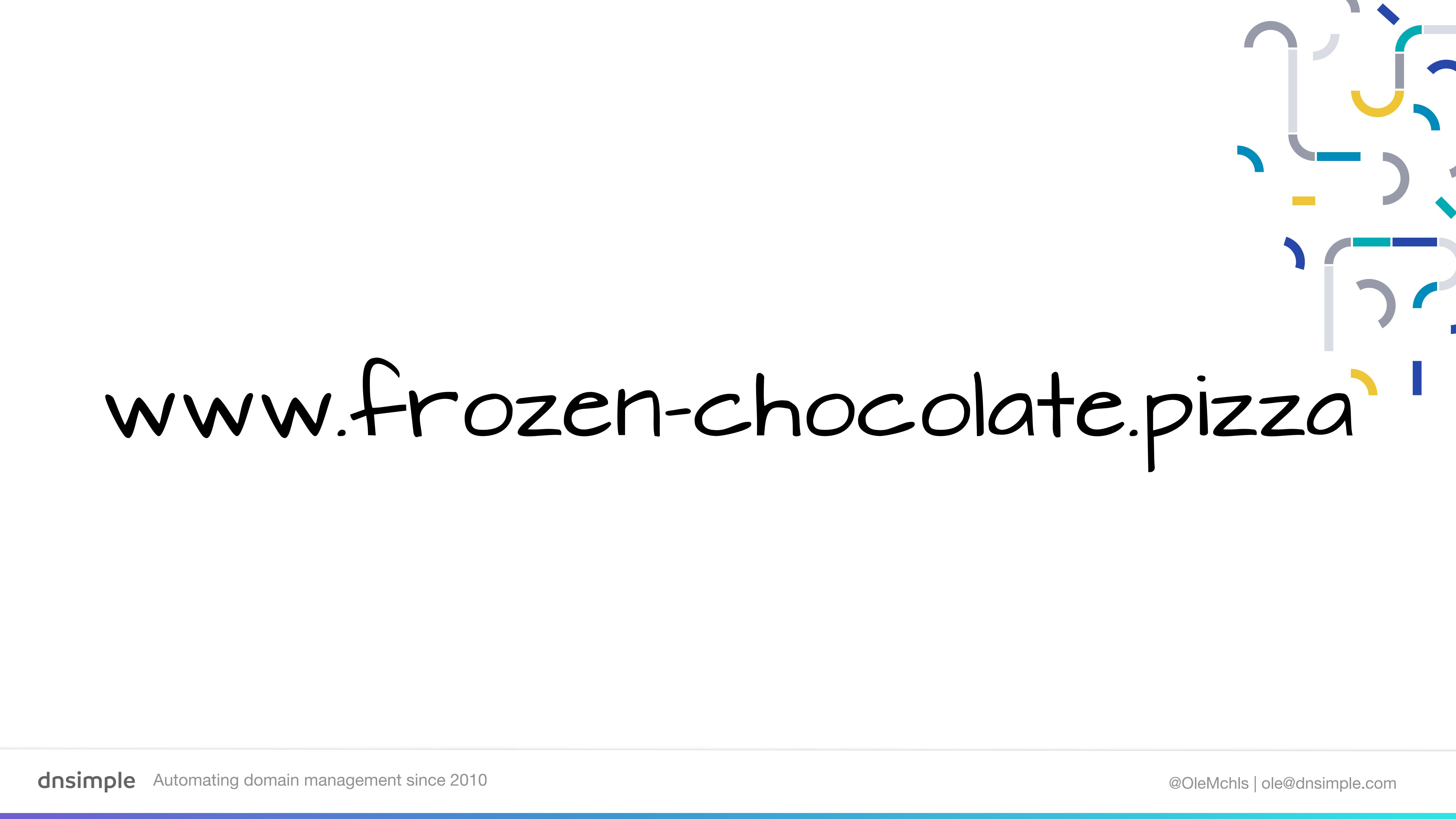
**RFC 3733 EPP Contact Mapping**



```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
  <command>
    <create>
      <domain:create
        xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
        <domain:name>frozen-chocolate.pizza</domain:name>
        <domain:period unit="y">2</domain:period>
        <domain:ns>
          <domain:hostObj>ns1.dnsimple.com</domain:hostObj>
          <domain:hostObj>ns2.dnsimple.com</domain:hostObj>
        </domain:ns>
        <domain:registrant>ole-123</domain:registrant>
        <domain:contact type="admin">ole-123</domain:contact>
        <domain:contact type="tech">ole-123</domain:contact>
        <domain:authInfo>
          <domain:pw>2fooBAR</domain:pw>
        </domain:authInfo>
      </domain:create>
    </create>
    <cLTRID>ABC-12345</cLTRID>
  </command>
</epp>
```







www.frozen-chocolate.pizza



.pizza



# Top Level Domains (TLD)

# Top Level Domains

**Well actually...**

# Top Level Domains

## **Effective TLD (eTLD)**

# Top Level Domains

.co.uk

**Effective TLD (eTLD)**

# Top Level Domains

**Effective TLD (eTLD)**

**.co.uk**

**.com.au**

# Top Level Domains

**Effective TLD (eTLD)**

**.co.uk**

**.com.au**

**.de.vu**

# Top Level Domains

## Effective TLD (eTLD)

.co.uk

.com.au

~~.de.vu~~

# Top Level Domains

## Country Code TLDs ccTLDs

# Top Level Domains

.de

## Country Code TLDs ccTLDs

# Top Level Domains

.de

.es

# Country Code TLDs

## ccTLDs

# Top Level Domains

.de

.es

.fr

## Country Code TLDs ccTLDs

# Top Level Domains

.de

.es

.fr

.is

## Country Code TLDs ccTLDs

# Top Level Domains

.de

.es

.fr

.is

.us

## Country Code TLDs ccTLDs

# Top Level Domains

## Country Code TLDs ccTLDs

.de

.es

.fr

.is

.us

.sc

# Top Level Domains

## Country Code TLDs ccTLDs

.de  
.es  
.fr  
.is  
.us  
.sc  
.af

# Top Level Domains

## Generic TLDs gTLDs

# Top Level Domains

.com

**Generic TLDs**  
gTLDs

# Top Level Domains

**Generic TLDs**  
**gTLDs**

**.com**  
**.org**

# Top Level Domains

**Generic TLDs**  
**gTLDs**

**.com**  
**.org**  
**.ngo**

# Top Level Domains

**Generic TLDs**  
**gTLDs**

**.com**  
**.org**  
**.ngo**  
**.info**

# Top Level Domains

## New Generic TLDs new gTLDs

Top Level Domains

.best

# New Generic TLDs

## new gTLDs

# Top Level Domains

.best

.capital

## New Generic TLDs

### new gTLDs

# Top Level Domains

.best  
.capital  
.app

## New Generic TLDs

### new gTLDs

# Top Level Domains

**New Generic TLDs**  
new gTLDs

.best  
.capital  
.app  
.اَلْرِبْدَنْ

# Top Level Domains

**New Generic TLDs**  
new gTLDs

.best  
.capital  
.app  
.الاردن  
.中國

# Top Level Domains

**New Generic TLDs**  
new gTLDs

.best  
.capital  
.app  
.الاردن.  
.中國

.hamburg

# Top Level Domains

## New Generic TLDs new gTLDs

.best  
.capital  
.app  
.الاردن.  
.中國  
.hamburg  
.pizza

# Who owns .pizza?



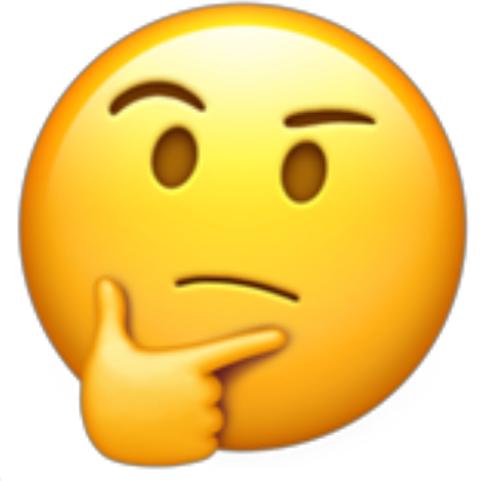
Who owns .pizza?



=



**Donuts  
Domain Registry**











# Internet Corporation for Assigned Names and Numbers

## ICANN

# How to get your own gTLD





# How to get your own gTLD

1. Apply for gTLD at ICANN for US\$185,000 (\$5,000 cash deposit)



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2. Provide the following:



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2. Provide the following:
  1. Proof of legal establishment



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2. Provide the following:
  1. Proof of legal establishment
  2. Financial statements



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  3. *Community endorsement*



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  3. *Community endorsement*
  4. *Government support or non-objection*



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  5. *Documentation of third-party funding commitments*



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3. In case of conflicting applications: win auction (*String Contention*)



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3. In case of conflicting applications: win auction (*String Contention*)
4. Pass extended ICANN evaluation



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4. Pass extended ICANN evaluation
5. ...



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3. In case of conflicting applications: win auction (*String Contention*)
4. Pass extended ICANN evaluation
5. ...
6. Profit



## Top Stories

### 01. Verisign files intriguing domain backorder patents

POSTED UNDER Policy & Law

### 02. Domain Capital goes after Prince's estate for reverse domain name hijacking

POSTED UNDER Policy & Law

### 03. Div Turakhia hands over the reins of Media.net to Vaibhav Arya

POSTED UNDER Services

## FEATURED DOMAINS



LOGICBOXES

Use our free  
Registrar Cost Advantage  
calculator

# ICANN group wants feedback on how to spend \$240 million windfall

BY ANDREW ALLEMANN — OCTOBER 9, 2018 POLICY & LAW 0 COMMENTS

A lot of money is at stake in new TLD auction fund.



LOGICBOXES

### ELITE RESELLER PROGRAM

- ✓ Low Domain Costs
- ✓ 800+ TLDs to register
- ✓ 24x7 Support

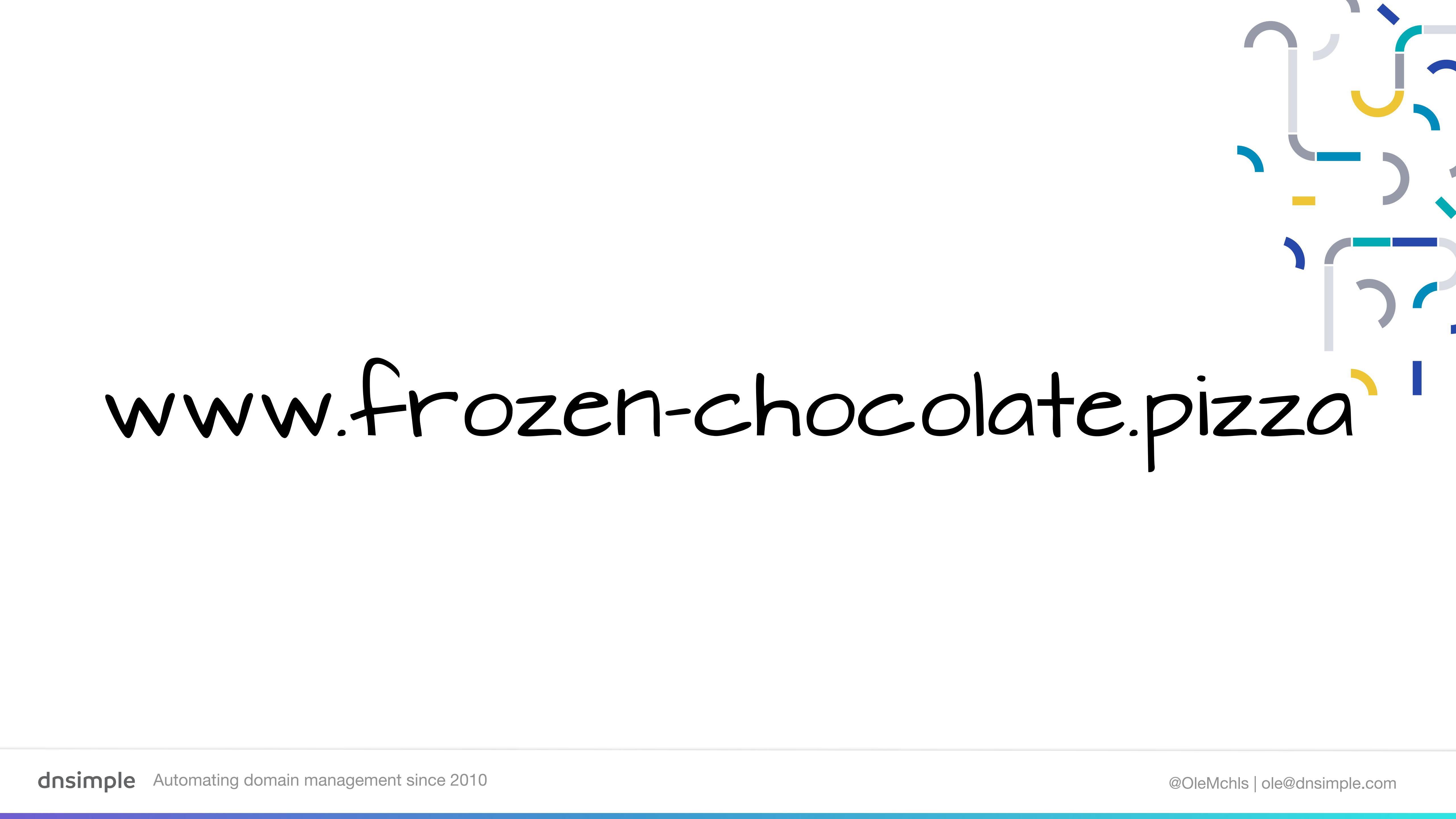
[GET IN TOUCH](#)

Domain investors are happier at [name.com](#)

[Find out why](#)

THE SHIELD  
BETWEEN FRAUD  
& YOUR FUNDS





www.frozen-chocolate.pizza

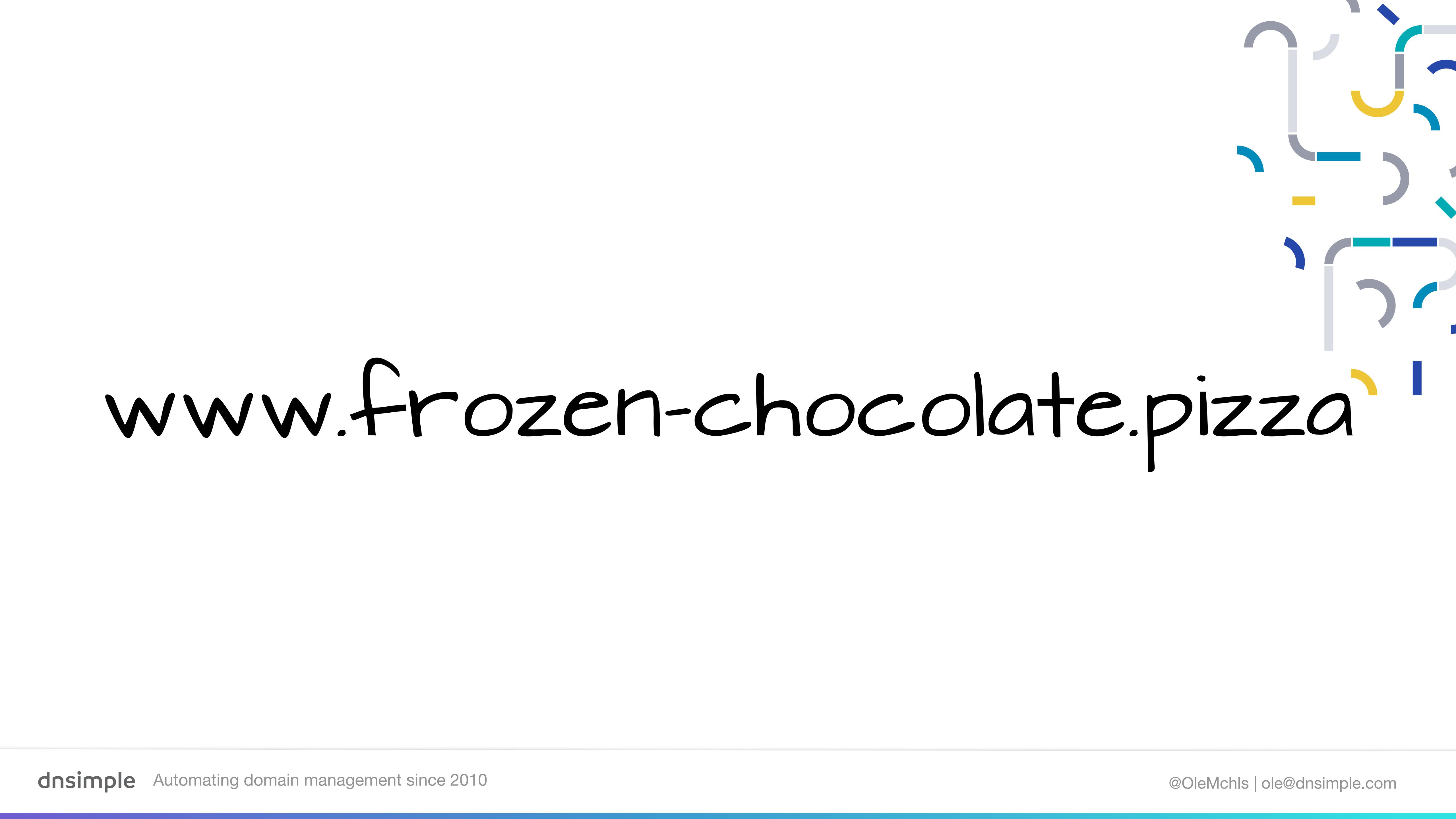


```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<epp xmlns="urn:ietf:params:xml:ns:epp-1.0">
    <response>
        <result code="1000">
            <msg>Command completed successfully</msg>
        </result>
        <resData>
            <domain:creData
                xmlns:domain="urn:ietf:params:xml:ns:domain-1.0">
                <domain:name>frozen-chocolate.pizza</domain:name>
                <domain:crDate>2018-04-03T22:00:00.0Z</domain:crDate>
                <domain:exDate>2019-04-03T22:00:00.0Z</domain:exDate>
            </domain:creData>
        </resData>
        <trID>
            <clTRID>ABC-12345</clTRID>
            <svTRID>54321-XYZ</svTRID>
        </trID>
    </response>
</epp>
```









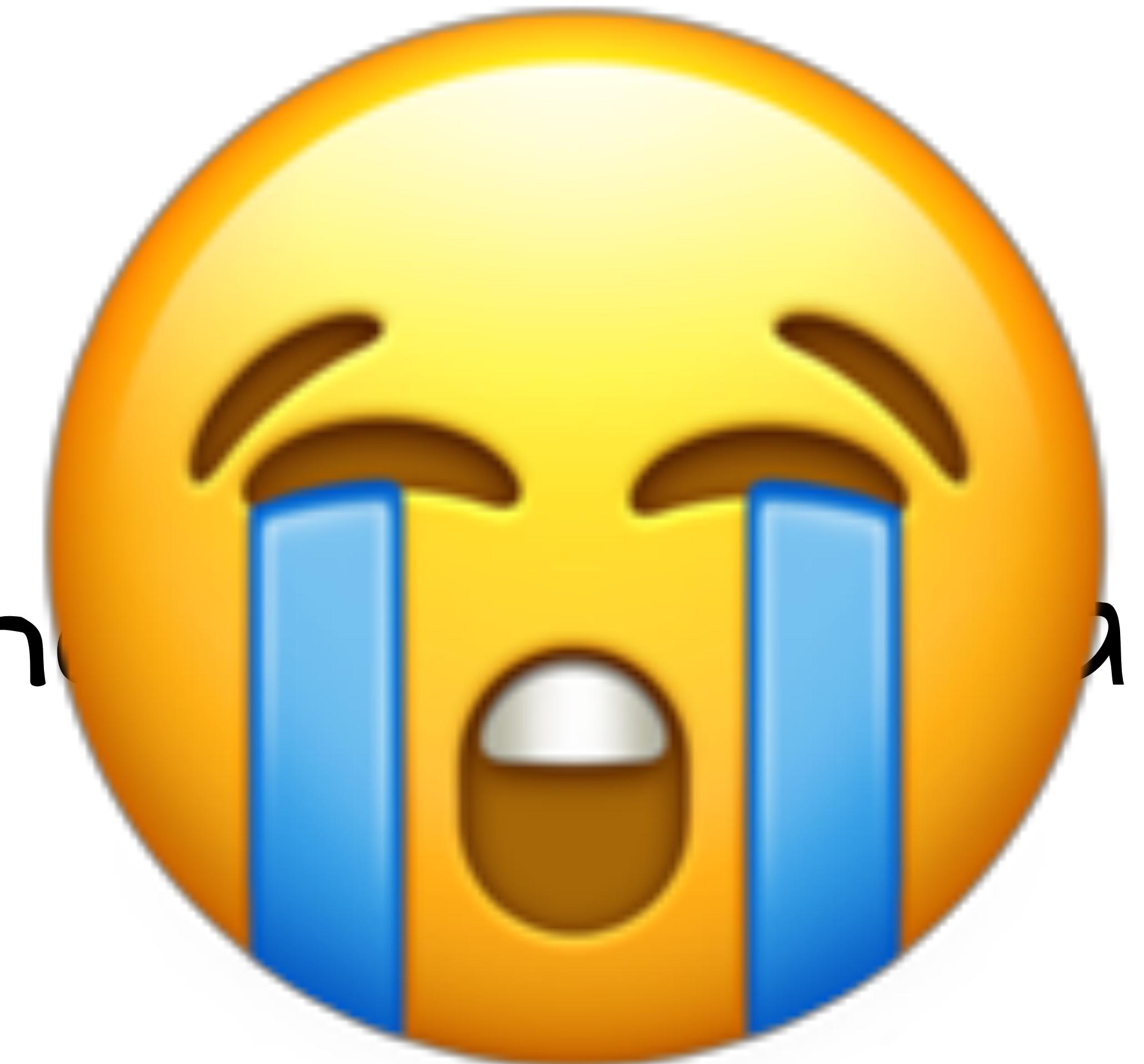
www.frozen-chocolate.pizza



**www.chocolate.pizza**



www.ch





**Just 995 GBP\* (1,130 Euro) on the  
after market.**

\* <https://sedo.com/search/details/?domain=chocolate.pizza>

# Transfer a domain

# Transfer a domain



You

# Transfer a domain



You

→  
**requests  
transfer**

Transfer a domain

# Gaining Registrar



You



requests  
transfer



Transfer a domain

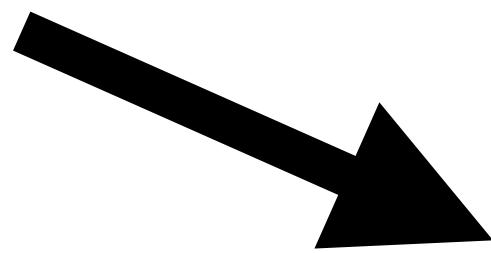
# Gaining Registrar



You



requests  
transfer



directs to auth  
code and unlock

Transfer a domain



You

→  
**requests  
transfer**

## Gaining Registrar



→  
**directs to auth  
code and unlock**

Loosing Registrar



Transfer a domain

## Gaining Registrar



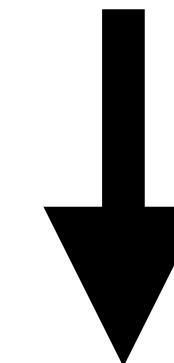
You

→  
**requests  
transfer**



→  
**directs to auth  
code and unlock**

Loosing Registrar



**provide means to  
get auth code and  
unlock domain**

Transfer a domain



You

requests  
transfer

## Gaining Registrar

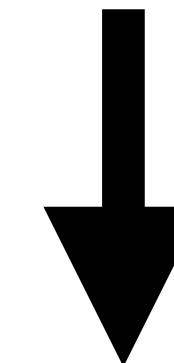


gets WHOIS  
data

directs to auth  
code and unlock



Loosing  
Registrar



provide means to  
get auth code and  
unlock domain

Transfer a domain



You

requests transfer

## Gaining Registrar

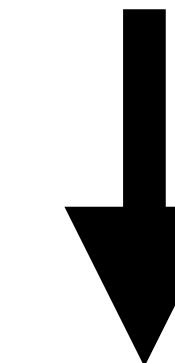


gets WHOIS  
data

sends FOA to  
RNH or AC

directs to auth  
code and unlock

## Loosing Registrar



provide means to  
get auth code and  
unlock domain

Transfer a domain



You

## Gaining Registrar



requests transfer

gets WHOIS data

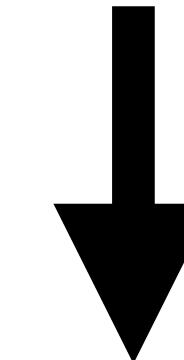
sends FOA to RNH or AC

directs to auth code and unlock

provides code and initiates transfer



## Loosing Registrar



provide means to get auth code and unlock domain

Transfer a domain



You

## Gaining Registrar



requests transfer

gets WHOIS data

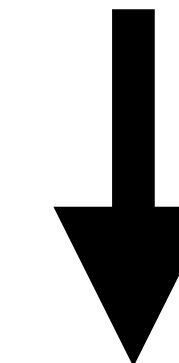
sends FOA to RNH or AC

directs to auth code and unlock

provides code and initiates transfer



## Loosing Registrar



provide means to get auth code and unlock domain



Registry

Transfer a domain



You

## Gaining Registrar



requests transfer

gets WHOIS data

sends FOA to RNH or AC

directs to auth code and unlock

provides code and initiates transfer



## Loosing Registrar

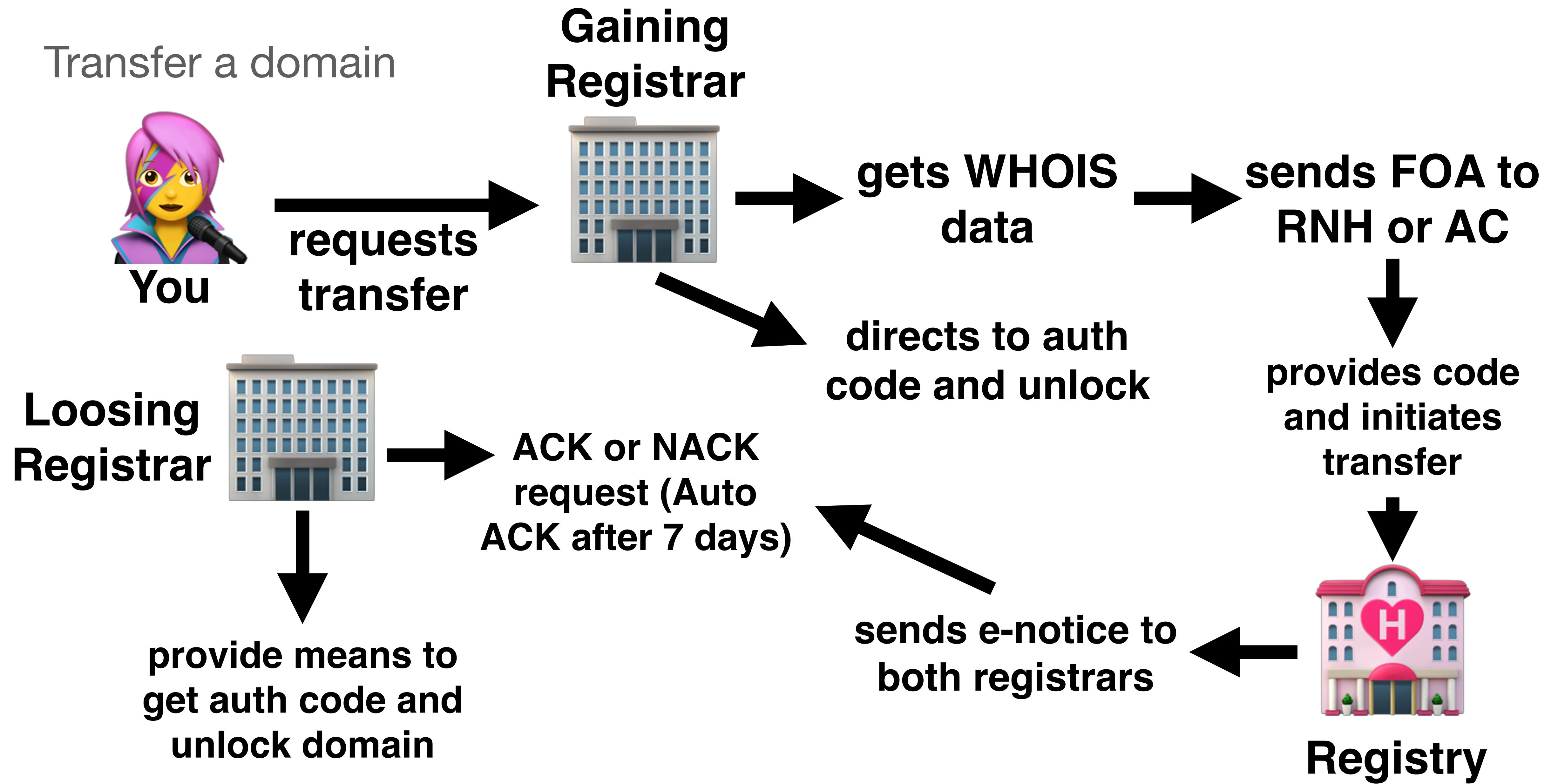
provide means to get auth code and unlock domain

sends e-notice to both registrars

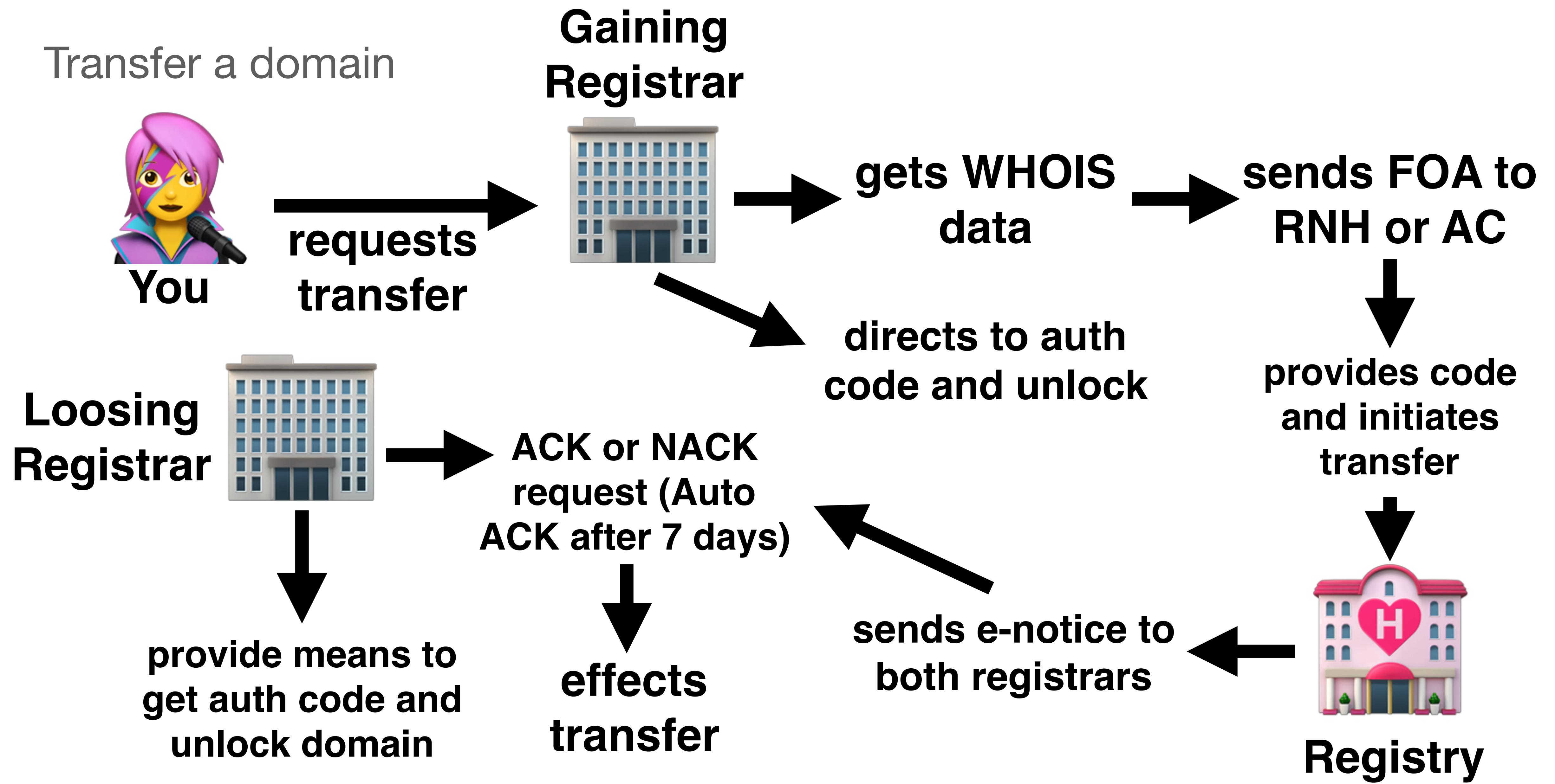


Registry

## Transfer a domain



## Transfer a domain











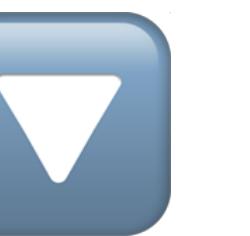








# chocolate.pizza



**164.241.84.2**





# chocolate.pizza



?



# 164.241.84.2



**chocolate.pizza**



**Domain Name System (DNS)**



**164.241.84.2**

# One hand DNS knowledge



# One hand DNS knowledge

1. UDP\*



# One hand DNS knowledge

1. UDP\*

2. Binary





# One hand DNS knowledge

1. UDP\*
2. Binary
3. Not encrypted



# One hand DNS knowledge

1. UDP\*
2. Binary
3. Not encrypted
4. Defined across 52 RFCs since 1983

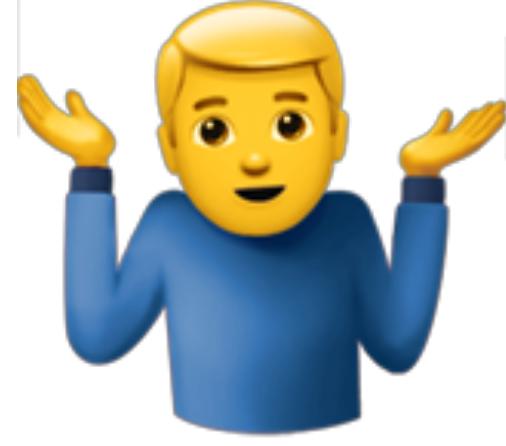


# One hand DNS knowledge

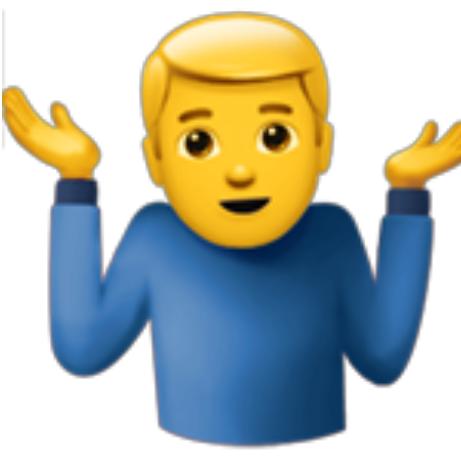
1. UDP\*
2. Binary
3. Not encrypted
4. Defined across 52 RFCs since 1983
5. Can also resolve IP to hostname

# howdns.works

howdns.works



**process**



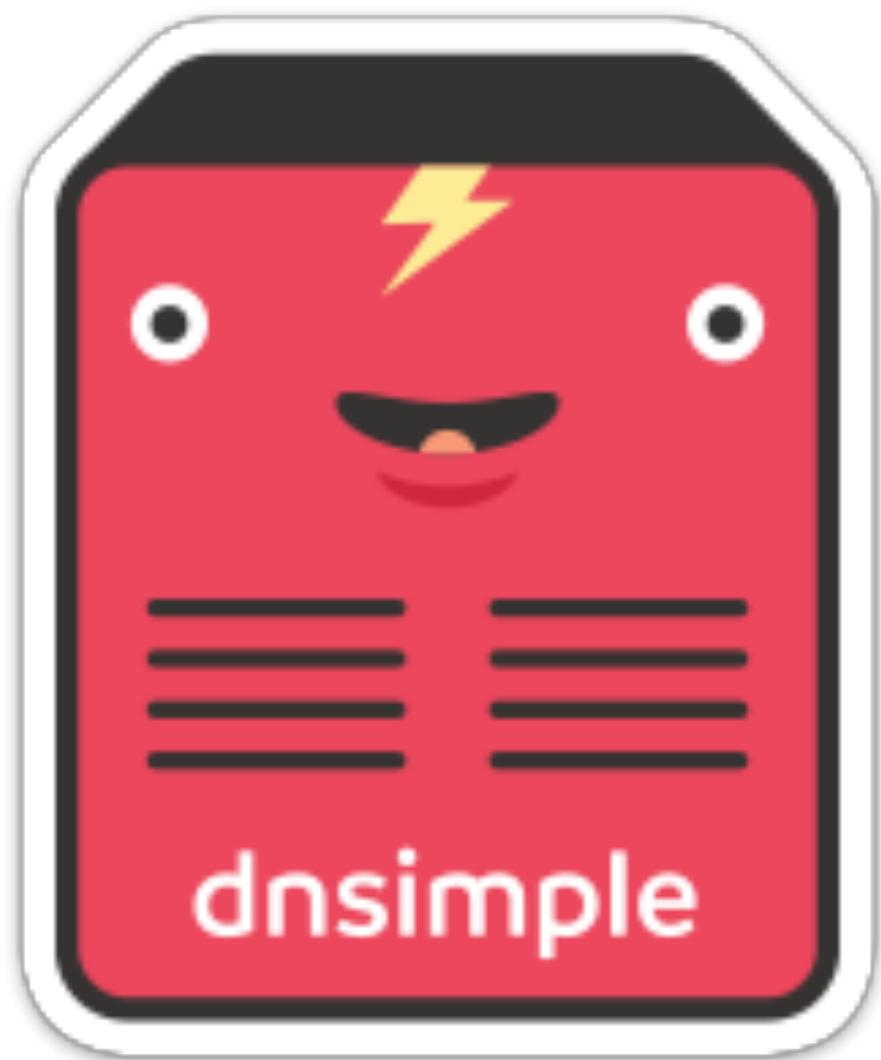
process

**what is the IP of  
chocolate.pizza?**

process



what is the IP of  
chocolate.pizza?

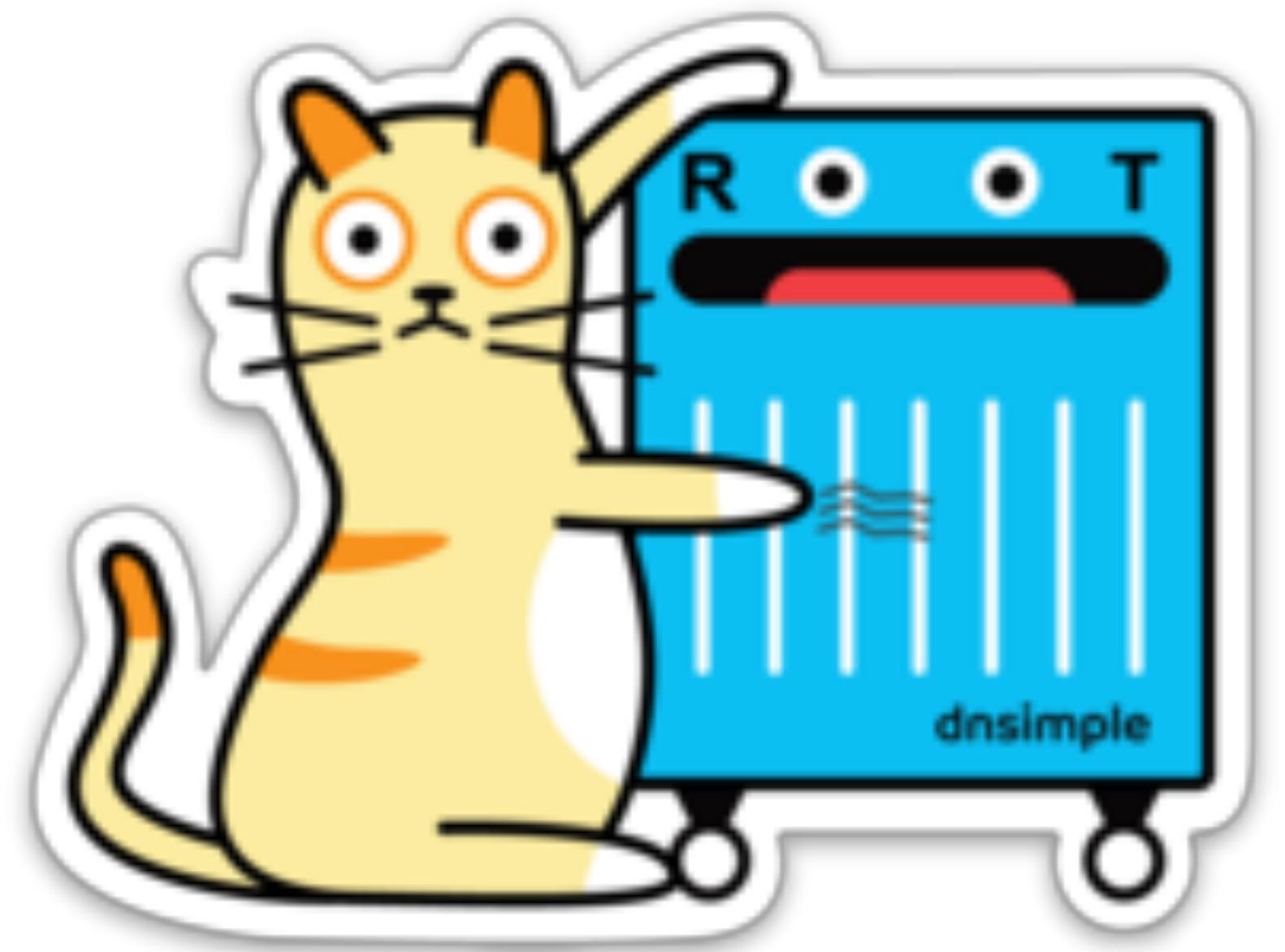


resolver

# howdns.works



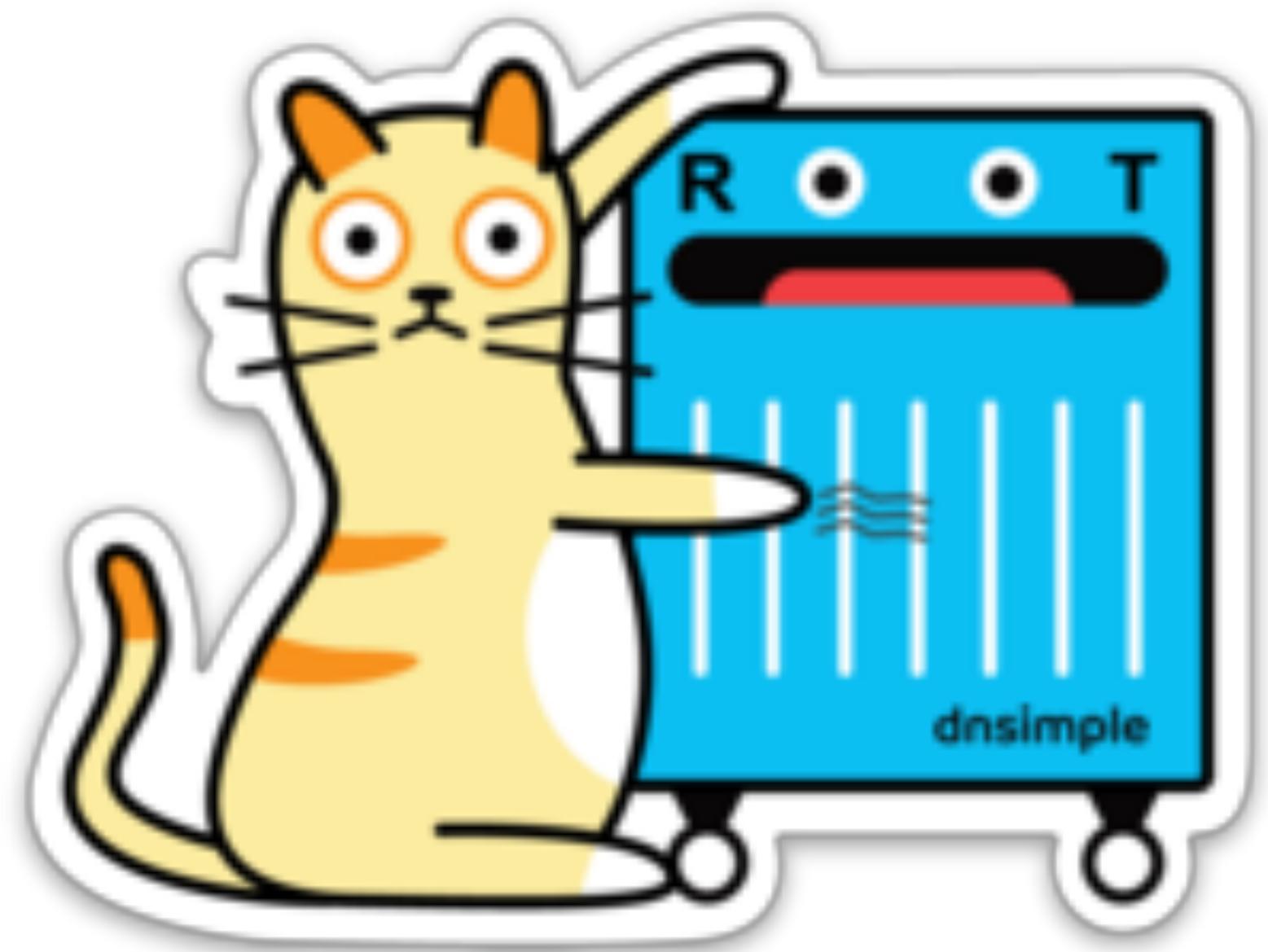
# howdns.works

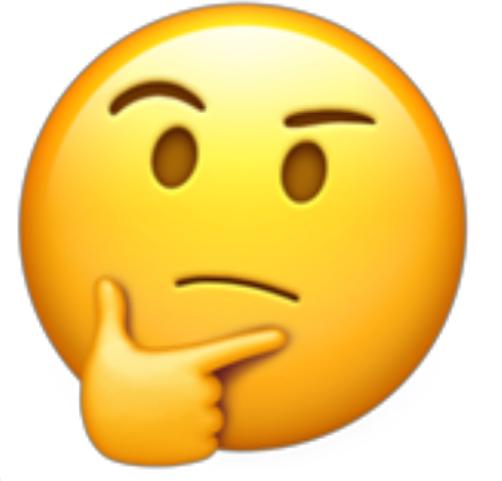


howdns.works



where is  
.pizza?





# ICANN DNS Root servers

# ICANN DNS Root servers

a.root-servers.net  
b.root-servers.net  
c.root-servers.net  
d.root-servers.net  
e.root-servers.net  
f.root-servers.net  
g.root-servers.net  
h.root-servers.net  
i.root-servers.net  
j.root-servers.net  
k.root-servers.net  
l.root-servers.net  
m.root-servers.net

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a.root-servers.net  
b.root-servers.net  
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m.root-servers.net

VeriSign, Inc.

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j.root-servers.net  
k.root-servers.net  
l.root-servers.net  
m.root-servers.net

VeriSign, Inc.  
University of Southern California (ISI)

# ICANN DNS Root servers

a.root-servers.net

b.root-servers.net

c.root-servers.net

d.root-servers.net

e.root-servers.net

f.root-servers.net

g.root-servers.net

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i.root-servers.net

j.root-servers.net

k.root-servers.net

l.root-servers.net

m.root-servers.net

VeriSign, Inc.

University of Southern California (ISI)

Cogent Communications

# ICANN DNS Root servers

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VeriSign, Inc.

University of Southern California (ISI)

Cogent Communications

University of Maryland

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VeriSign, Inc.

University of Southern California (ISI)

Cogent Communications

University of Maryland

NASA (Ames Research Center)

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a.root-servers.net  
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m.root-servers.net

VeriSign, Inc.  
University of Southern California (ISI)  
Cogent Communications  
University of Maryland  
NASA (Ames Research Center)  
Internet Systems Consortium, Inc.

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VeriSign, Inc.  
University of Southern California (ISI)  
Cogent Communications  
University of Maryland  
NASA (Ames Research Center)  
Internet Systems Consortium, Inc.  
US Department of Defense (NIC)

# ICANN DNS Root servers

a.root-servers.net	VeriSign, Inc.
b.root-servers.net	University of Southern California (ISI)
c.root-servers.net	Cogent Communications
d.root-servers.net	University of Maryland
e.root-servers.net	NASA (Ames Research Center)
f.root-servers.net	Internet Systems Consortium, Inc.
g.root-servers.net	US Department of Defense (NIC)
h.root-servers.net	US Army (Research Lab)
i.root-servers.net	
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e.root-servers.net	NASA (Ames Research Center)
f.root-servers.net	Internet Systems Consortium, Inc.
g.root-servers.net	US Department of Defense (NIC)
h.root-servers.net	US Army (Research Lab)
i.root-servers.net	Netnod
j.root-servers.net	
k.root-servers.net	
l.root-servers.net	
m.root-servers.net	

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b.root-servers.net	University of Southern California (ISI)
c.root-servers.net	Cogent Communications
d.root-servers.net	University of Maryland
e.root-servers.net	NASA (Ames Research Center)
f.root-servers.net	Internet Systems Consortium, Inc.
g.root-servers.net	US Department of Defense (NIC)
h.root-servers.net	US Army (Research Lab)
i.root-servers.net	Netnod
j.root-servers.net	VeriSign, Inc.
k.root-servers.net	
l.root-servers.net	
m.root-servers.net	

# ICANN DNS Root servers

a.root-servers.net	VeriSign, Inc.
b.root-servers.net	University of Southern California (ISI)
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k.root-servers.net	RIPE NCC
l.root-servers.net	ICANN
m.root-servers.net	WIDE Project

# ICANN DNS Root servers

a.root-servers.net

VeriSign, Inc.

b.root-servers.n

University of Southern California (ISI)

c.root-server

Verizon Communications

d.root-serv

Maryland

e.root-ser

research Center)

f.root-ser

ns Consortium, Inc.

g.root-ser

U.S. Department of Defense (NIC)

h.root-ser

Search Lab)

i.root-servers.

, I

j.root-servers.n

RiPE NCC

k.root-servers.n

ICANN

l.root-servers.net

WIDE Project

m.root-servers.net

# howdns.works



howdns.works



.pizza  
**Name Server**

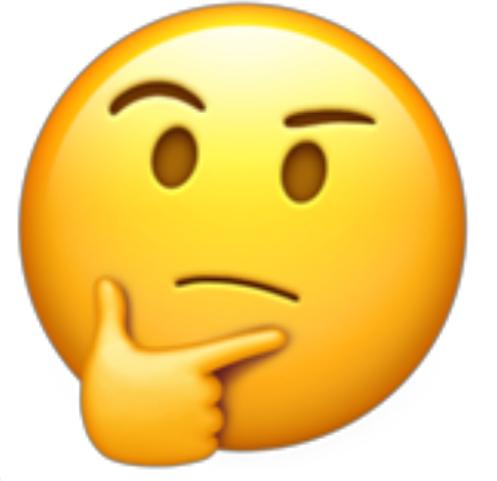
howdns.works



where is  
chocolate.pizza?



.pizza  
Name Server





= =



# howdns.works



howdns.works



# Authoritative Name Server

howdns.works



where is  
chocolate.pizza?



Authoritative  
Name Server

howdns.works



where is  
chocolate.pizza?

164.241.84.2

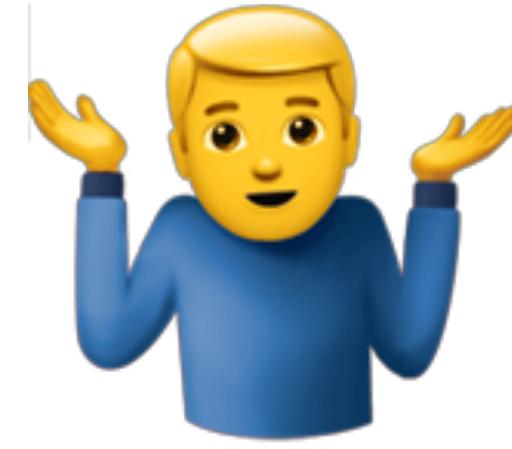


Authoritative  
Name Server

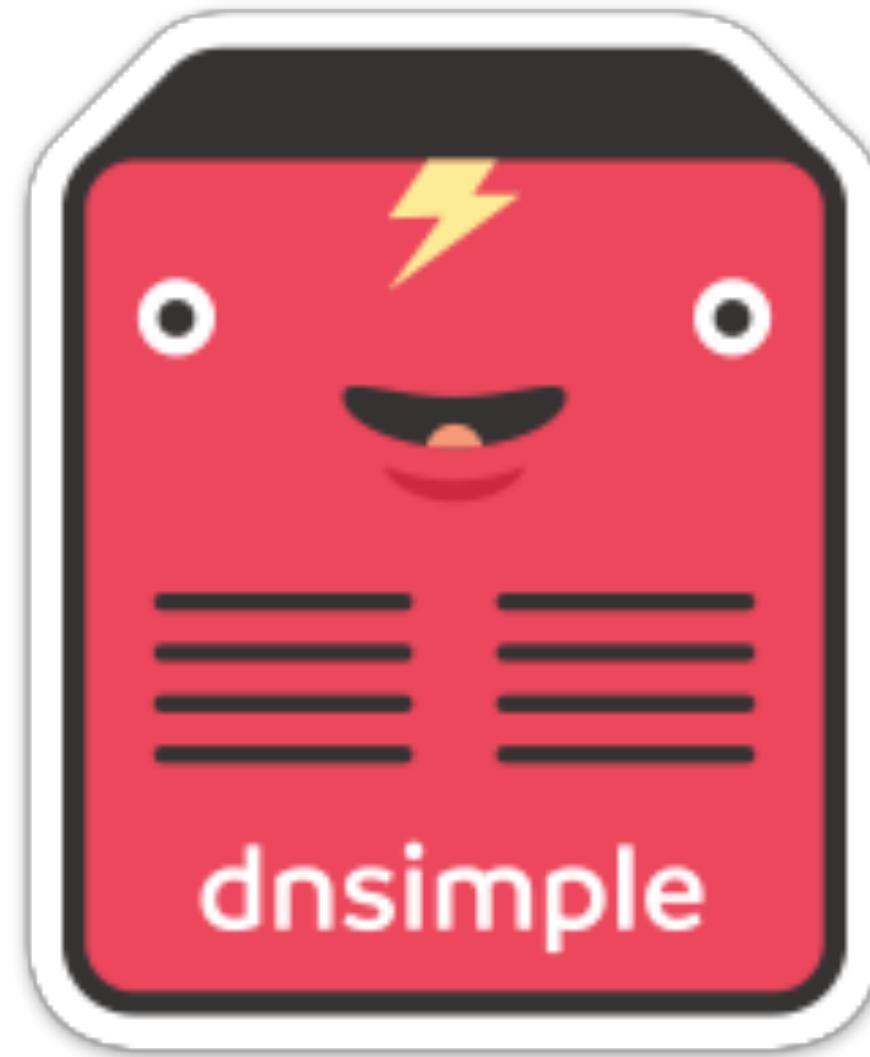
# howdns.works



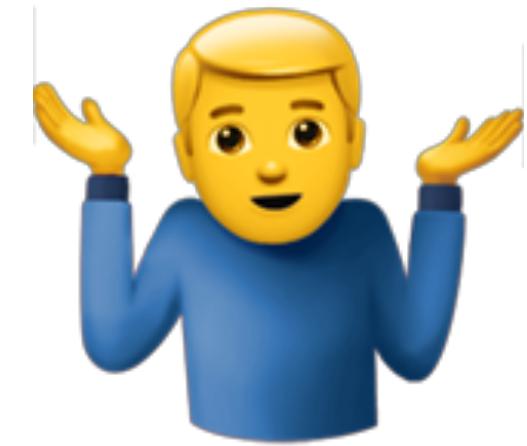
# howdns.works



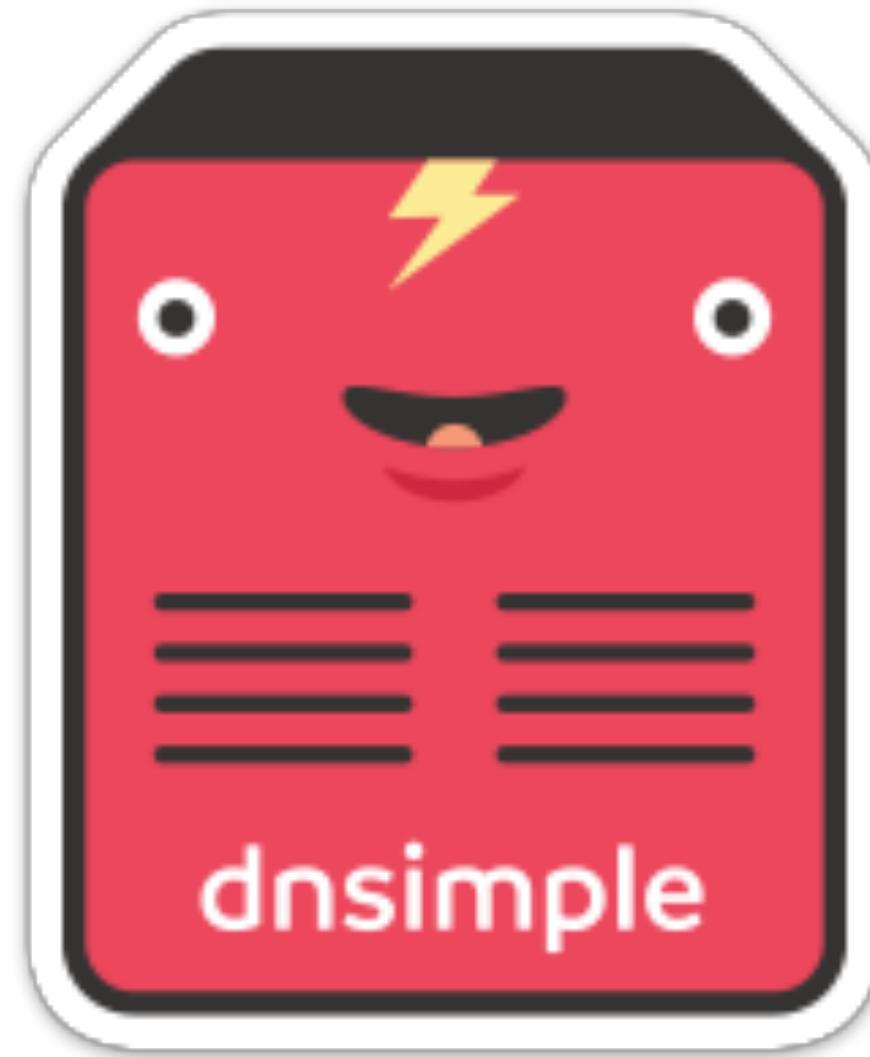
howdns.works



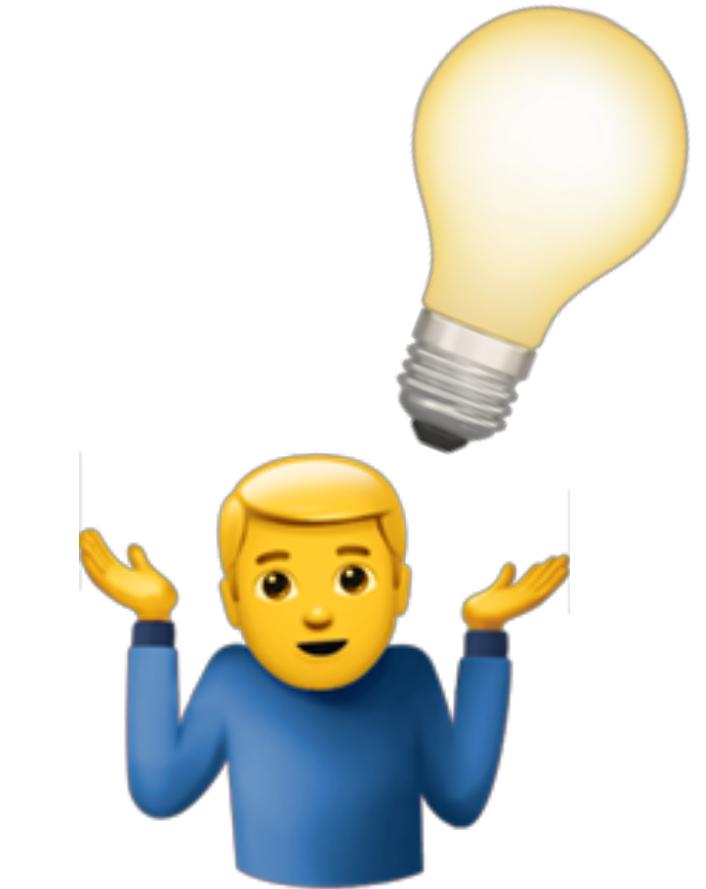
**chocolate.pizza is  
at 164.241.84.2**



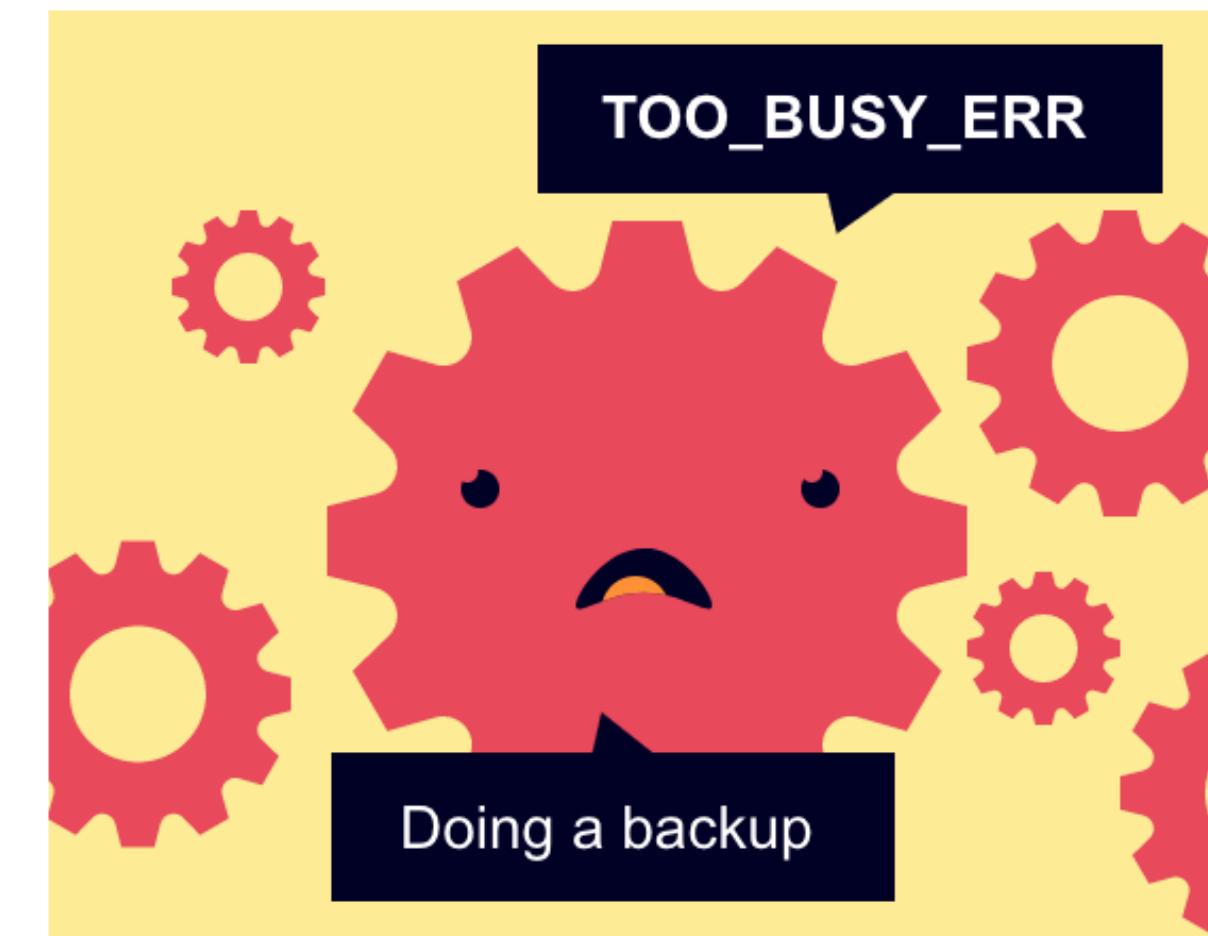
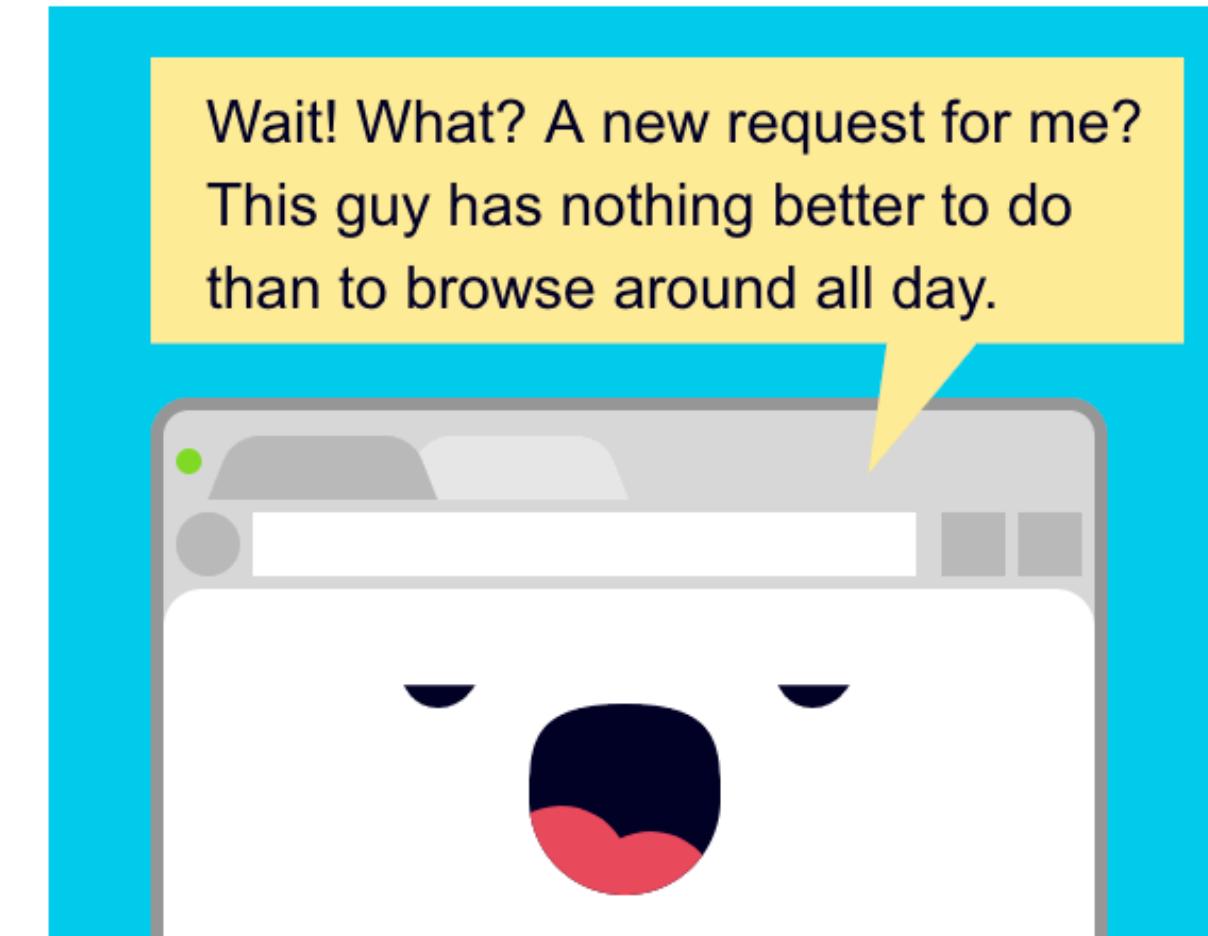
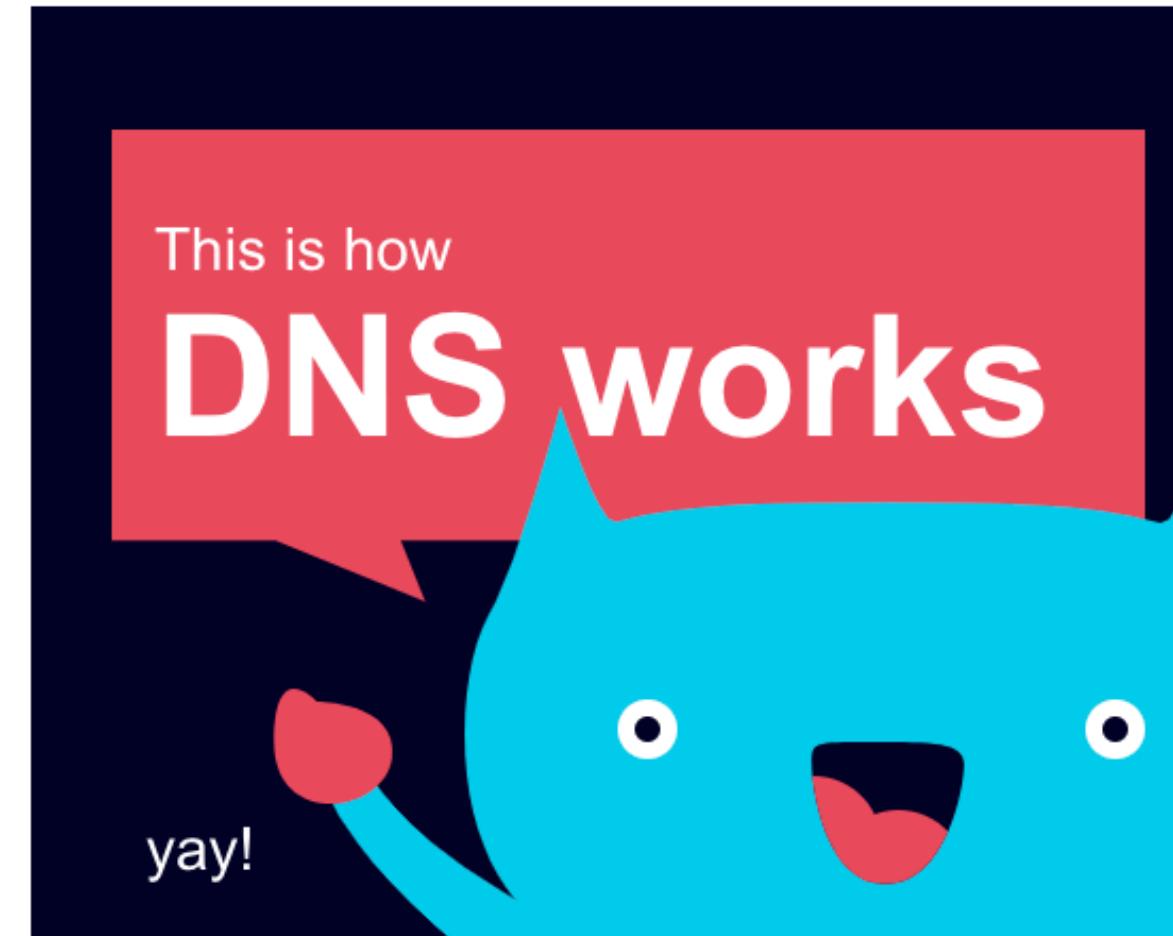
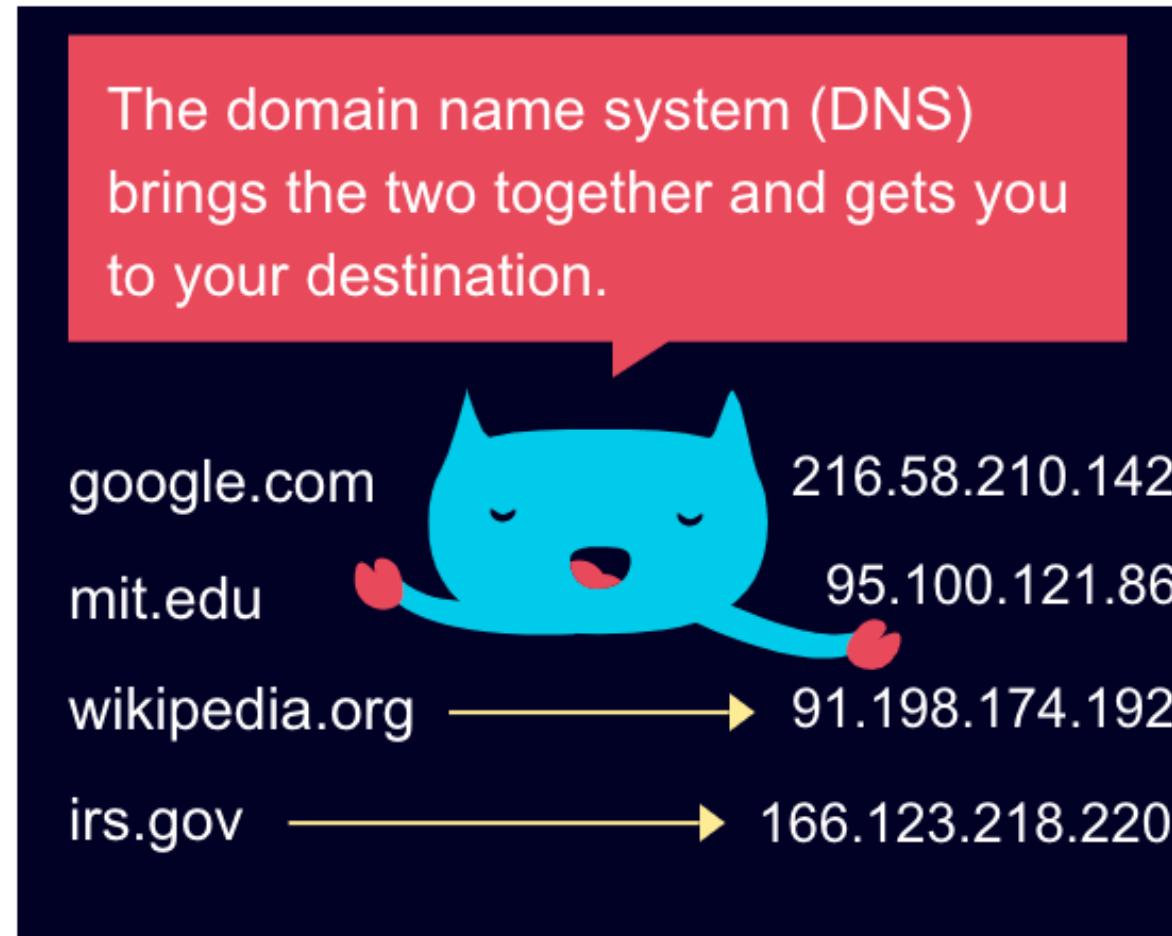
howdns.works



**chocolate.pizza is  
at 164.241.84.2**



# Read the full comic at: <http://howdns.works>





→  
**SOON**





# One last thing...



# Transfer your domain without downtime

# Transfer your domain without downtime

Transfer your domain without downtime

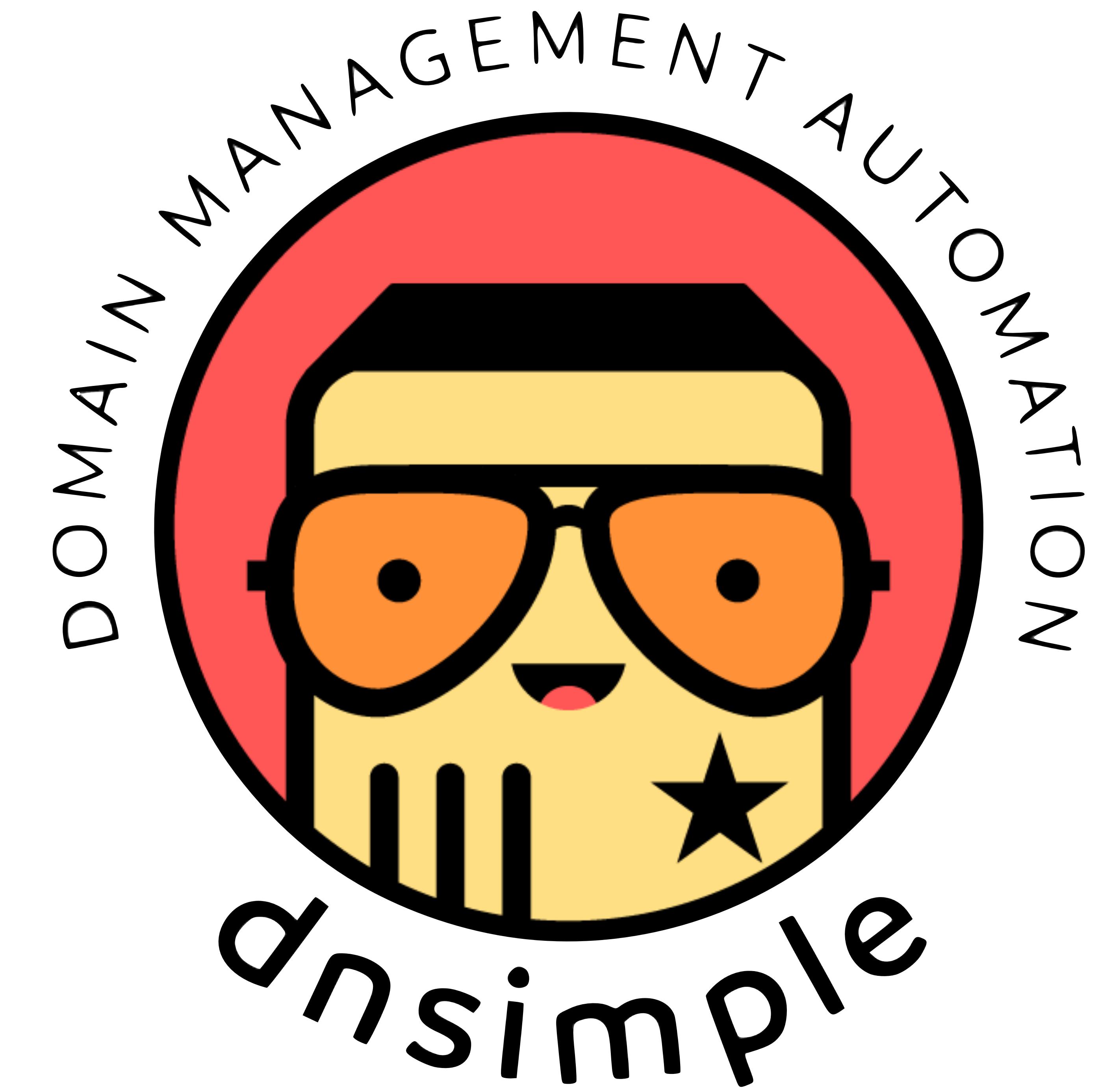


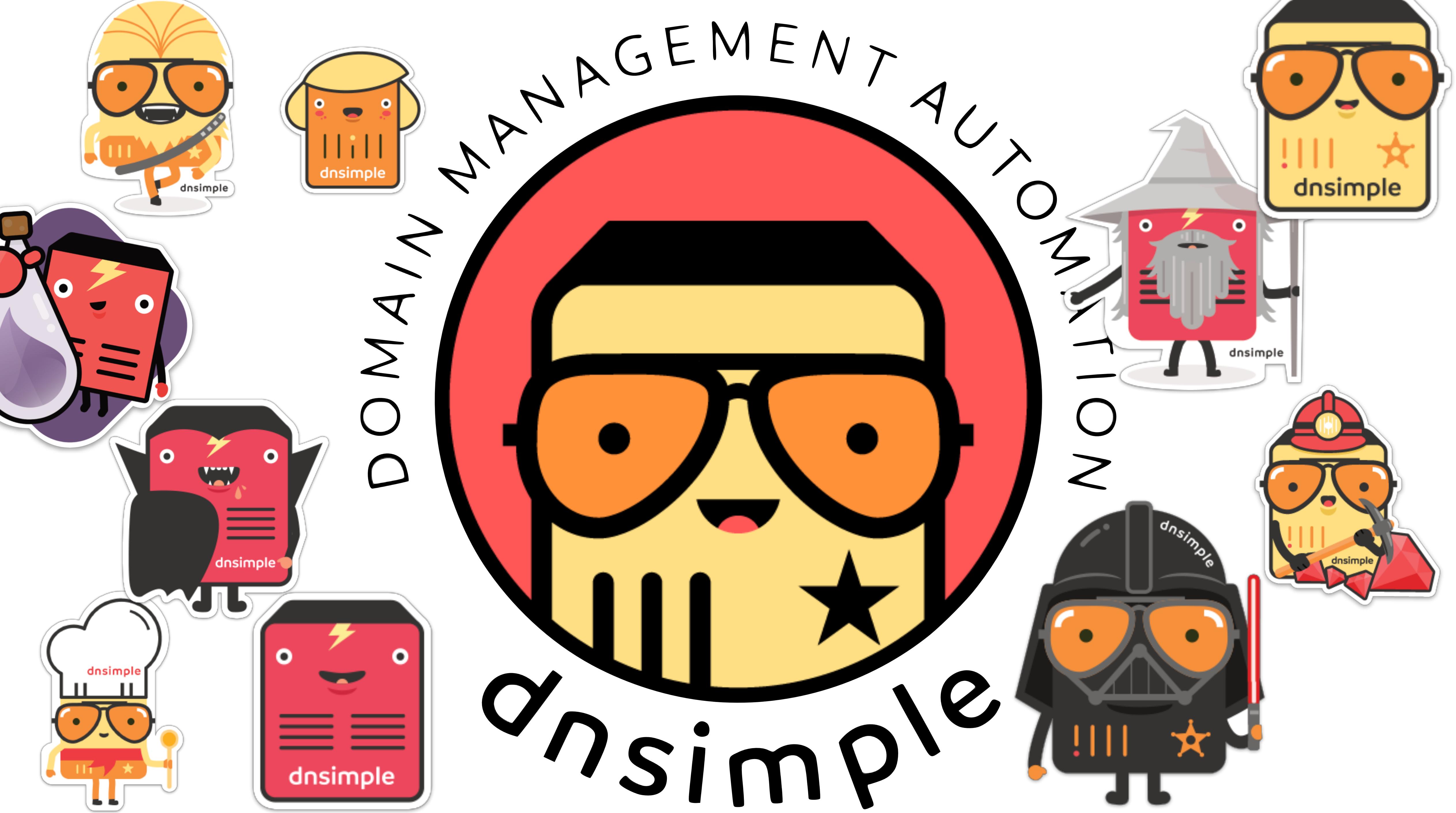
**Change name servers first**

Transfer your domain without downtime

- 👉 **Change name servers first**
- 👉 **Transfer domain later**









Thanks! 😊小儿



# Questions?

## Ask now, or later:



***@OleMchls***



***ole@dnsimple.com***





# Ressources

1. [dnsimple.com](https://dnsimple.com)
2. [howdns.works](https://howdns.works)
3. [https://en.wikipedia.org/wiki/Domain Name System#Domain name syntax](https://en.wikipedia.org/wiki/Domain_Name_System#Domain_name_syntax)
4. <https://www.iana.org/domains/root/servers>
5. [https://en.wikipedia.org/wiki/.app\\_\(gTLD\)](https://en.wikipedia.org/wiki/.app_(gTLD))
6. [https://en.wikipedia.org/wiki/Internet Assigned Numbers Authority](https://en.wikipedia.org/wiki/Internet_Assigned_Numbers_Authority)
7. [https://en.wikipedia.org/wiki/ICANN#Proposed elimination of public DNS whois](https://en.wikipedia.org/wiki/ICANN#Proposed_elimination_of_public_DNS_whois)
8. [https://en.wikipedia.org/wiki/Donuts\\_\(company\)](https://en.wikipedia.org/wiki/Donuts_(company))