Breaking security controls using domain hijacking

SWITCH

Daniel Stirnimann
daniel.stirnimann@switch.ch

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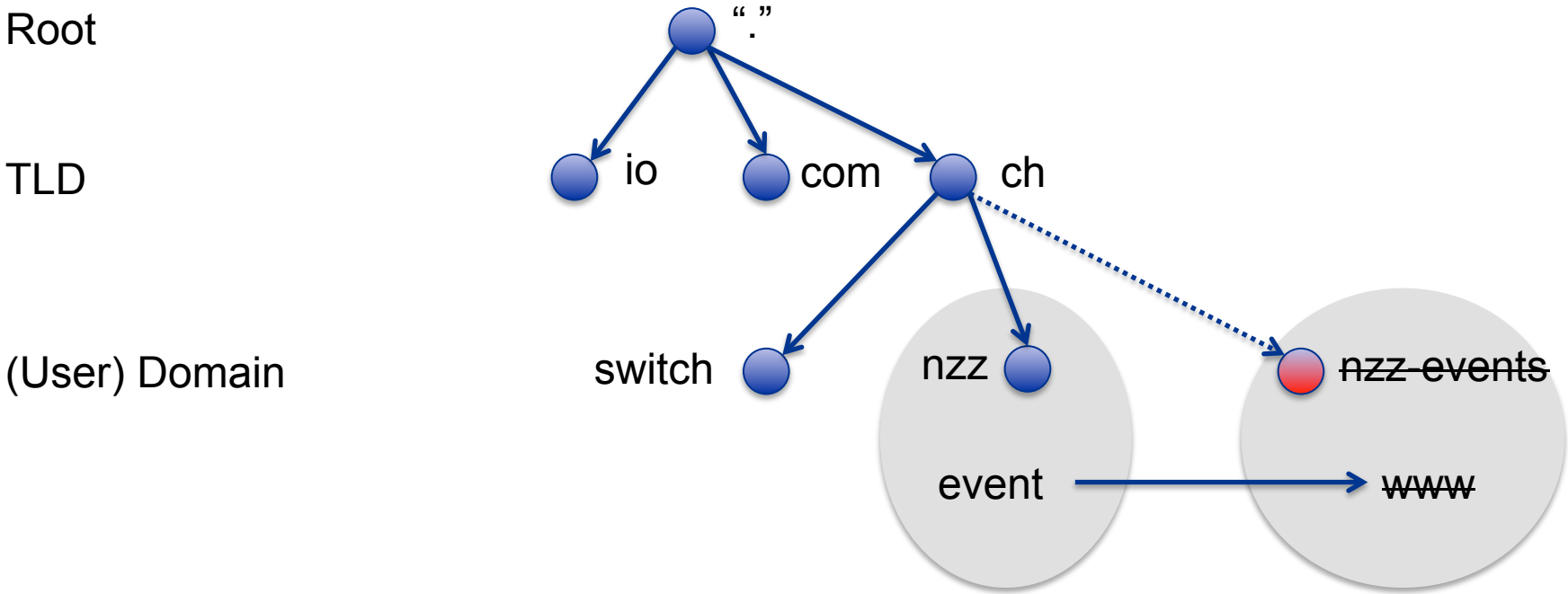
Enterprise vs. small shops domains

https://event.nzz.ch/

How does it work?




```
dig event.nzz.ch
;; status: NXDOMAIN
event.nzz.ch.      CNAME   www.nzz-events.ch.
```

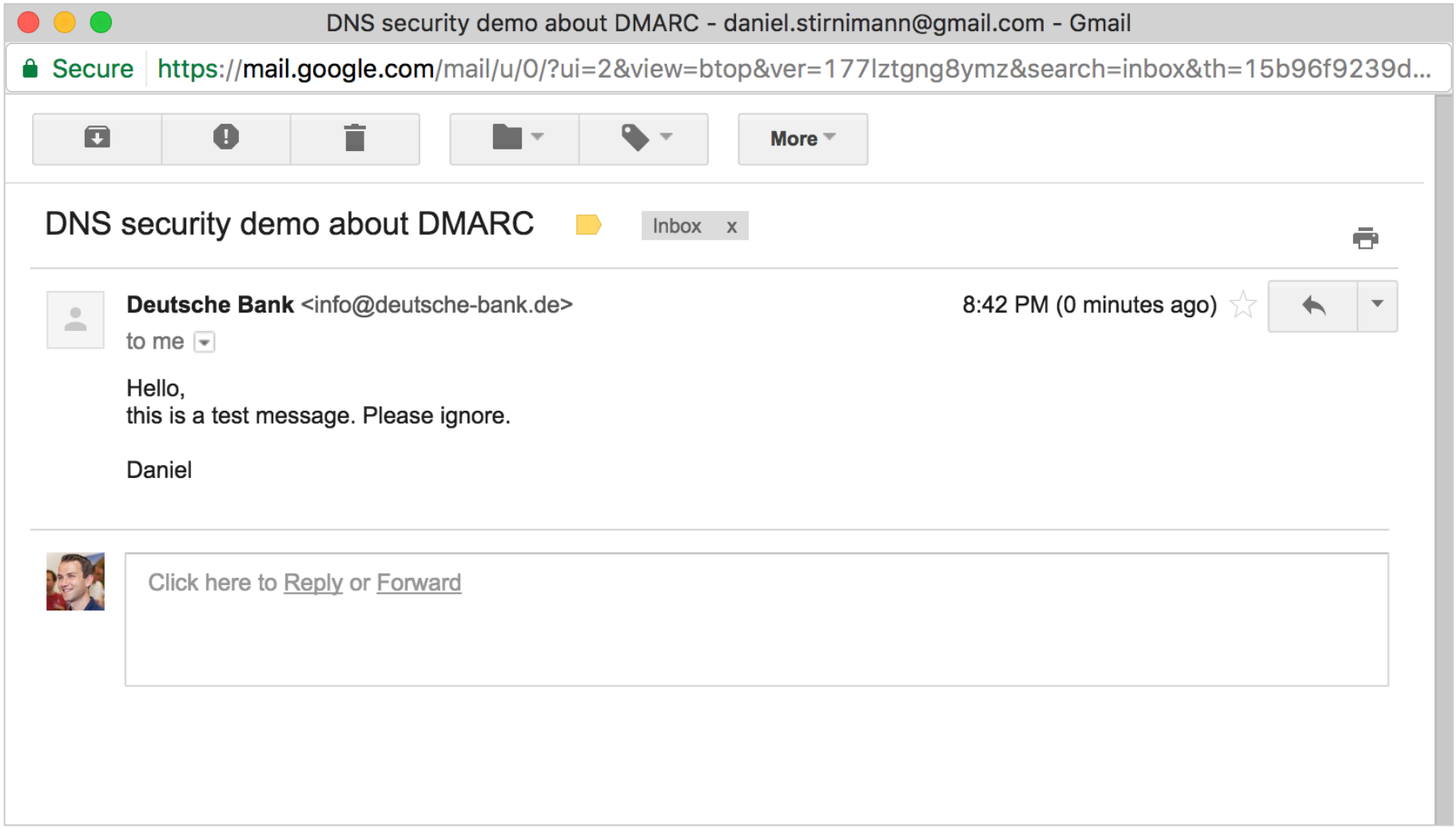
Abandoned subdomain!

- Trick/mislead user - social engineering
- Circumvent anti-mail spoofing protection such as DMARC

Sabotage:

- Use HTTP Public Key Pinning (HPKP) to render the subdomain unusable

Circumventing DMARC



Circumventing DMARC

SWITCH

Original Message

Message ID	<20170422204241.006499@dnsresolver.novalocal>
Created at:	Sat, Apr
From:	Deutsch
To:	daniel.s
Subject:	DNS security d ut DMARC
SPF:	PASS with IP 86.119.38.239 Learn more
DMARC:	PASS Learn more

```
dig bildung.deutsche-bank.de TXT +short
"v=spf1 ip4:86.119.38.239/32 -all”
```

```
dig _dmarc.deutsche-bank.de TXT +short
"v=DMARC1\;
 p=reject\;
 rua=mailto:deutsche-bank@rua.agari.com\;
 ruf=mailto:dmarc.reports@db.com\;
 ri=3600
”
```

If you have a security control which relies on DNS, then it's only as secure as your DNS!

Hostnames in Amazon AWS

myname-25189607.eu-west-1.elb.amazonaws.com

CNAME target is NXDOMAIN:

- test.swisstopo.admin.ch CNAME ses-test-elasticlo-13sc845pxkywd-1713101147.eu-west-1.elb.amazonaws.com
- www1011.stage.e.abb.com CNAME xc-elb-library-stage-1510629574.eu-west-1.elb.amazonaws.com

Hostnames in Microsoft Azure

myname.cloudapp.net.

myname.azurewebsites.net.

myname.azure-api.net.

CNAME target is NXDOMAIN:

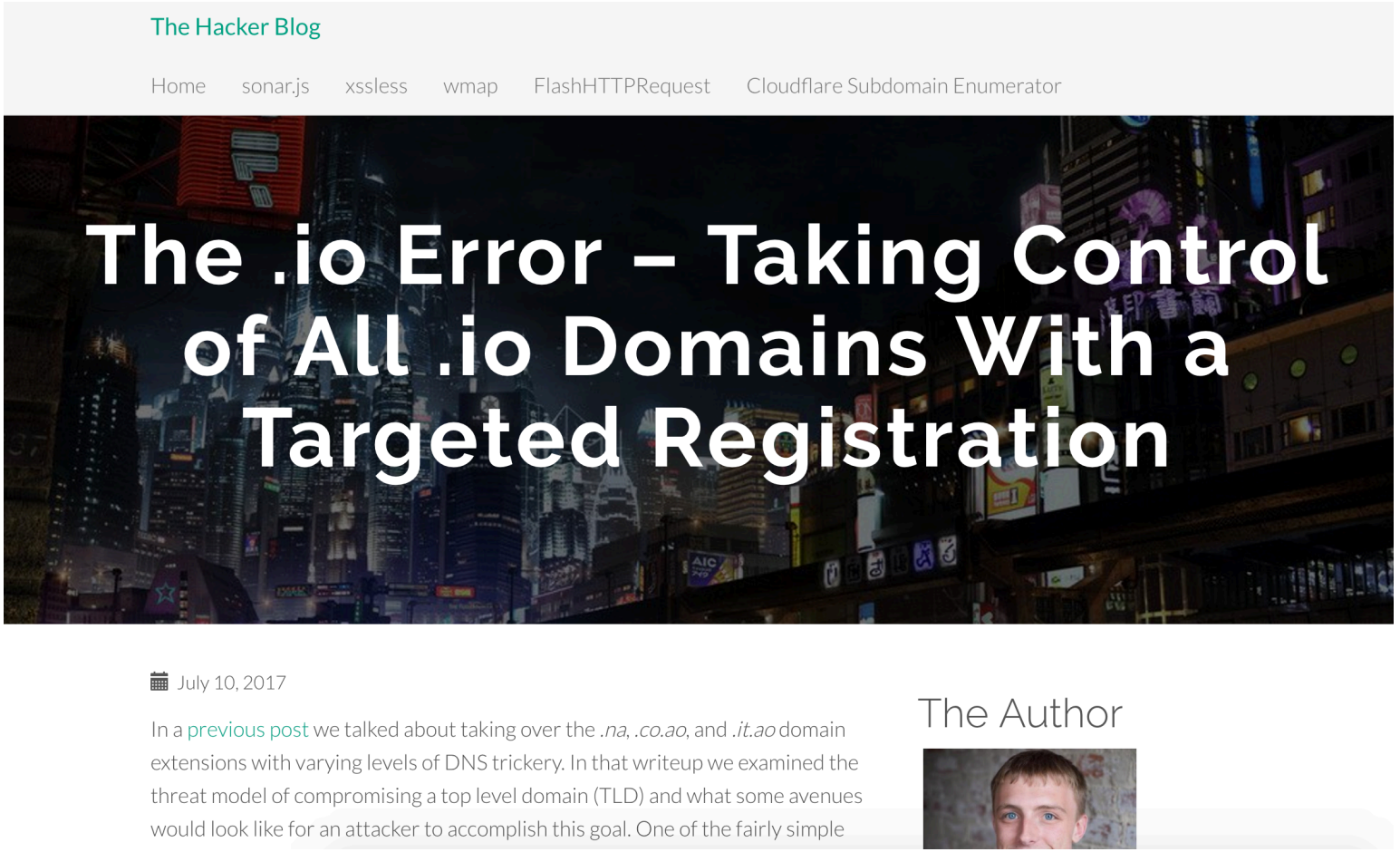
- workspaces.microsoft.com CNAME workspaces.azurewebsites.net.
- yourperfectday.hsbc.com CNAME shoot228.cloudapp.net.

Careful with Hostnames!

QTYPE with possible out-of-bailiwick hostnames

- CNAME
- NS
- MX
- DNAME
- SRV
- TXT (SPF, DMARC)

Domain Take Over



Source: https://thehackerblog.com/the-io-error-taking-control-of-all-io-domains-with-a-targeted-registration/

io. failure – what happened?

```
dig @a.root-servers.net io. NS
;; AUTHORITY SECTION:
io.         172800 IN  NS  a0.nic.io.
io.         172800 IN  NS  b0.nic.io.
io.         172800 IN  NS  c0.nic.io.
io.         172800 IN  NS  ns-a1.io.
io.         172800 IN  NS  ns-a2.io.
io.         172800 IN  NS  ns-a3.io.
io.         172800 IN  NS  ns-a4.io.

dig @a0.nic.io. io. NS
;; ANSWER SECTION:
io.         86400  IN  NS  b0.nic.io.
io.         86400  IN  NS  c0.nic.io.
io.         86400  IN  NS  a0.nic.io.
```

(In)active domain registration

whois blogwerk.com | avantcredit.ch | …

Name Server: NS0.DNSMADEEASY.COM

Name Server: NS1.DNSMADEEASY.COM

Na

Na

Na

Nam FUSED

Don't point your inactive domain to a DNS hoster/registrar!

Don't leave "open" name servers for unused domains

Mail take over

```
dig mac.ch MX +short
10 thisdomainisnotvalidformx.info.

whois thisdomainisnotvalidformx.info.
NOT FOUND
```

Don‘t use domain names you don‘t own!

Data sources for hostnames

- Internet wide scanning data https://censys.io/
- Certificate Transparency https://crt.sh/
- ~~Passive DNS https://www.dnsdb.info~~
  - (Free) access PassivTotal, VirusTotal

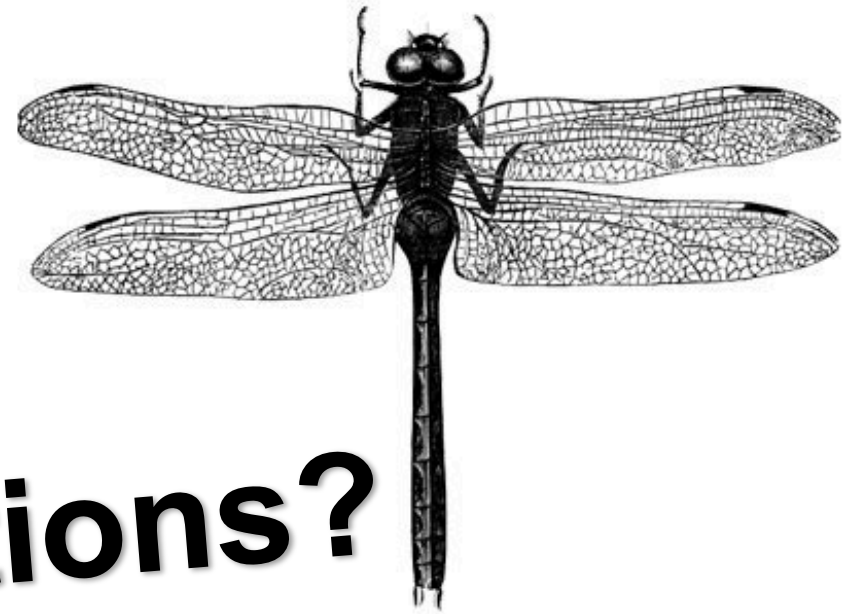
Recommendations

- Never use domain names you don’t own or which don’t exist in the DNS tree (e.g. .local, .corp)
- Regularly check your zone for hostnames which don’t resolve (NXDOMAIN)
- DNSSEC sign your zone and use DANE

Out-of-bailiwick hostname checker

https://github.com/stirnim/hostname-check

Questions?



Editing /etc/hosts for a living

Everything is a Fscking DNS Problem

The Definitive Guide

O RLY?

Kris Buytaert