THE SPAMHAUS PROJECT

Domains:
A phishing chokepoint

Carel Bitter | ICANN IDS 2019

Are these bad?

(Spoiler alert: Yes)

Many are not marked as bad

No messages seen...

No significant traffic...

No website to crawl...

...yet!

IF YOU ARE CONSIDERING A CAR IN THE LUXURY CLASS, TAKE A CAREFUL LOOK AT THIS DETAILED IMPERIAL BLUEPRINT. BRIEFLY, IT EXPLAINS A FEW OF THE ENGINEERING REASONS THAT MAKE IMPERIAL THE INCOMPARABLE LUXURY CAR OF 1985.

SCALE: 1" = 1'5"	129" WHEELBASE
DRAWING: Matt Black	THE INCOMPARABLE DMC

IMPERIAL'S 4.1 LITER, FUEL INJECTED V-8 ENGINE PROVIDES INCREASED ACCELERATION AND RESPONSIVENESS OVER LAST YEAR'S ENGINE — YET RETAINS THE SAME EFFICIENT COMPRESSION RATIO AND OUTPUT RATING.

DUAL FILTERS IN GASOLINE TANK AND FUEL LINE GIVE DOUBLE PROTECTION AGAINST FOREIGN PARTICLES ENTERING CARBURETOR.

NEW CAMSHAFT DESIGN DELIVERS IMPROVED ACCELERATION. TAPPET PLUNGERS ARE CHROME PLATED TO BETTER RESIST WEAR.

IMPERIAL IS ONE OF THE MOST SPACIOUS AUTOMOBILES BUILT IN AMERICA. IT SHARES ITS BODY SHELL WITH NO SMALLER CARS. THUS, INTERIOR SHOULDER ROOM AND HIPROOM IN THE MODEL SHOWN EXCEED FIVE FEET, FRONT AND REAR.

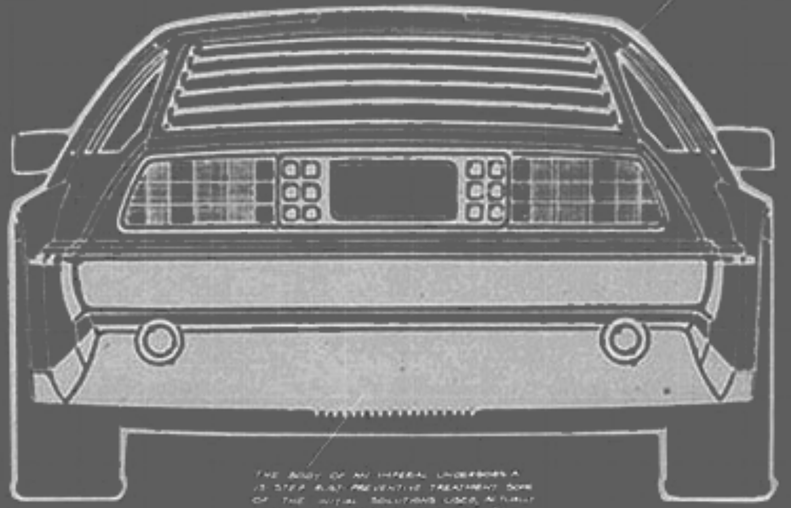
POWERED BY
FLUX CAPACITOR
1.21 GIGAWATTS

WHEN THIS SPEEDOMETER READS 88 MPH YOU'RE GOING SEE SOME SERIOUS SHIT!

IMPERIAL'S 3-SPEED TORQUE-CONVERTER AUTOMATIC TRANSMISSION IS ABOUT THE MOST RESPONSIVE AVAILABLE IN ANY AUTOMOBILE. IT'S A BETTER VERSION OF THE TYPE MANY DRAG STRIP DRIVERS PREFER.

HIGH CARBON STEEL TORSION BARS SOAK UP ROUGHEST ROAD SHOCKS BEFORE THEY REACH THE CAR BODY.

IMPERIAL'S NEW, LOWER PROFILE TIRES OFFER IMPROVED HANDLING, REDUCE TIRE SQUEAL, INTURE LONGER TREAD LIFE.



THE BODY OF AN IMPERIAL UNDERGOES A 13 STEP RUST PREVENTIVE TREATMENT. SOME OF THE INITIAL SOLUTIONS USED ACTUALLY INCREASE THE STEEL'S RESISTANCE TO CORROSION, BY CHANGING THE MOLECULAR SURFACE STRUCTURE.

The goal

A simple, straight-forward system that can expand using readily or easily available data on nothing more than the second level domain string, with the goal of making a phish / not phish judgement, without having the actual phishing message available.

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Why target domains?

The domains are a choke point.
Break the chain and the phishing fails.

Domains are also well-supported to execute filtering decisions on. Browsers, email and DNS all support filtering on domain level.

Why target domains?

There is a big opportunity for registries and registrars to proactively contribute towards fighting abuse.

1) Domain (string)

Lots can be learned by just looking at the base (2nd level) domain.

Advantages: Readily available (zone files, pDNS, registrations)

Brands, context, actions

icloud.com-id-confirm.com

login.icloud.com.igsx.ga

help.Instagram-copyrightsupport.ml

paypallimitedsec-confirm.com

accounts.google.com.support-centre.site

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https-pay-netf1ix.icu

Obfuscation detection (1)

Edit distance: the number of operations required to change one string into another.

Instagrarn > instagram = 3

Obfuscation detection (2)

N-gram analysis, in this case using trigams.

security > sec ecu cur uri rit ity

securty > sec ecu cur urt rty

Homoglyphs

Homoglyphs provide for an excellent obfuscation method.

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github.xn--aetwork-4x2zag.com

github.assetworks.com

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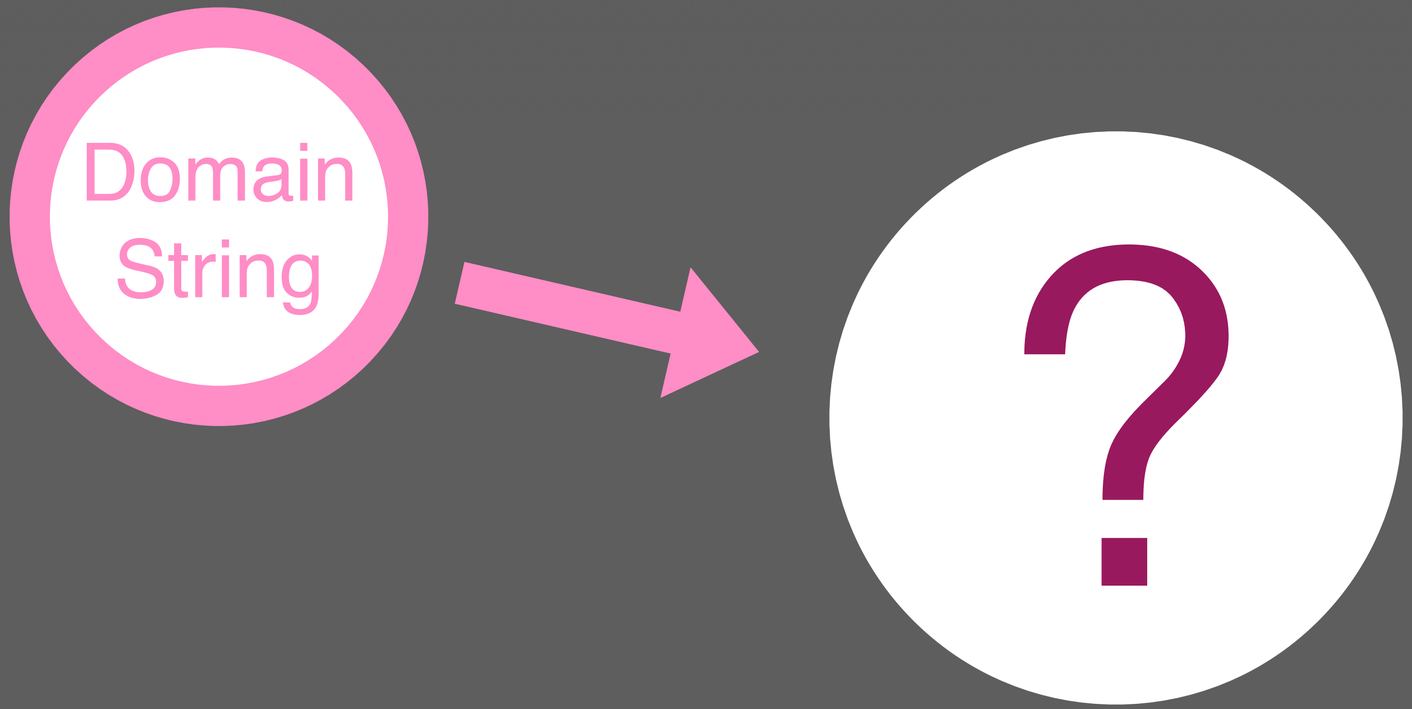

Domain
String
?

2) Domain metadata

Domain metadata can be of great help in amplifying some other measurements.

Advantages: Mostly available
(although sometimes difficult to get at scale).

Domain age

Reputation is gained over time. Old means a long standing and continuous investment.

New can be suspicious.

Domain expiry

New, and for <1 year

New, and for >1 year

Old, and for <1 year

Old, and for >1 year

Domain TLD

Free vs. paid-for

ccTLD/gTLD/new gTLD/free TLD/pseudo TLD

Open vs. restricted registration

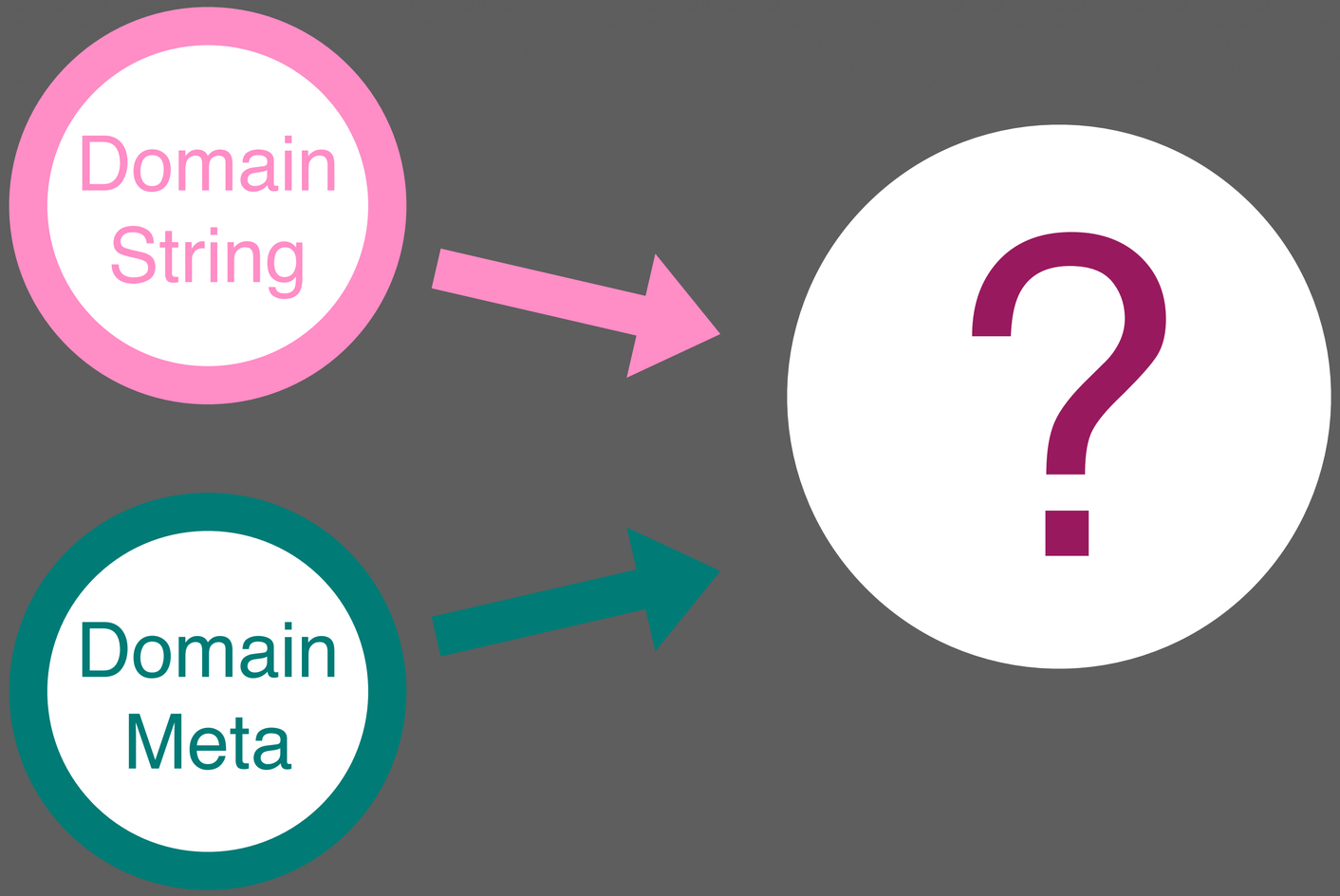
Domain TLD

Free vs. paid-for

ccTLD/gTLD/new gTLD/free TLD/pseudo TLD

Open vs. restricted registration

Operationally hard: pricing and promotions


Domain
String
Domain
Meta
?

3) DNS

DNS information gives us anchors for attaching history and reputation.

Advantages: Cheap to get at scale, history exists, reputation exists.

NS Records

These can be found without touching miscreant infrastructure.

Age, self-NS vs external, NS IP addresses, reputation of those IP addresses, volatility, pDNS history ...

A/MX/TXT/etc records

Caveat: by doing a record lookup that needs an answer from the domain authoratives you might reveal yourself.

Augment and expand as you would for NS.


Domain String
Domain Meta
?
DNS

4) SSL certificates

Newly created SSL certificates are public, thanks to the Certificate Transparency project.

Advantages: Free and open, near realtime.

Certificate issuer

Who issued the certificate?

Paid vs. free

Certificate calendar mapping

Compare certificate issue date to the domain issue date.

Same considerations apply as to domain age.

Common Name (CN)

A certificate is usually given out for a specific name on a domain.

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A certificate is usually given out for a specific name on a domain.

com-id-login.us

copyright-10000739255.info

joonggonara-613901.cf

Common Name (CN)

A certificate is usually given out for a specific name on a domain.

appleid.apple.com-id-login.us

facebook.com.copyright-10000739255.info

pay.naver.com-cafe.joonggonara-613901.cf

Common Name (CN)

Sometimes the entire domain is new:
Certificates can be an input by itself.

The stream itself is a valuable source of domains (but: good and bad).


Domain String
Domain Meta
?
DNS
Certs

Conclusion

Finding suspect phishing domains without having the phishing message is certainly possible. There is plenty of low-hanging fruit and places to pick it. Depending on your appetite for risk, various mitigation strategies are possible.

Thank you!

For domain reputation discussions, metadata tales and my famous salmon recipe:

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