OSY.SSI [2018] [13]

In the news...

- CIA comms compromised in Iran, 30 agents dead, using Google [link] [link]
- 44 years old Windows bug (e.g. `C:/con/con`) [link]
- Intel PortSmash side-channel attack [link]
- Not content with hacking into Belgacom, GCHQ sabotages the investigation [link]
- 81000 facebook accounts hacked [link]
- CVE-2018-9411: New critical vulnerability in Android [link]
- Critical vulnerability in Apple Mojave crypto [link]
- CVE-2018-4407: Kernel RCE on Apple ICMP stack [link]

In the last episode

Stack/heap overflow · ROP · spraying · UAF

Overall this course

- Look at technology with a new (and critical!) eye
- Test things beyond their normal/usual regimen
- Be curious and creative
- Put theories / metaphors / claims to the test
- Don't kill bugs, learn from them

And also the sorry state of technology

About today

A real-world operation.

Details were altered to conform to the contractual agreement between parties.

I'll try to illustrate as much as possible though.

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"Go as far as you can"

Let's go

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- OSINT: Google, LinkedIn, registers, whois, domains, e-mails, contractors, phone numbers (Harvester)
- Call a few people's preious employers for "background check" and references
- Google Maps, opening and closing hours, shodan (kamerka)
- Websites, webmails, different languages, 404, incorrect URLs

Recon: results

- A list of people, places, and their relationships
- An idea of where the legal team is working
- A list of public IPs for the company's webservers

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- Confirm clothing/branding
- Try to interact with other customers (discreetely)

Preparing for entry

Okay we may know enough to get further. We could

- Try to abuse the (insecure) webservers, which use an outdated TLS configuration (incl. for authentication)
- Send phishing e-mails with malware in it, since we know employees open them
- Try to get to the Wifi (WPA2) from outside, record, and decode later (cracking or getting Wifi key)
- Get branded shirts, get our tools, and go inside

Note: Up to this point, the risk was very minimal and we did not break any law (as we were mandated by the client)

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Note bis: Do not risk your life to make a point.

Getting inside

- Ingress points: main door (to main room), garage door (remote clicker, elevator+badge)
- Main room guarded (2 persons visible, walking), under camera surveillance (+1 guard videowatching?)
- Guards arrive about 30 minutes before closure and depart 30 minutes after opening
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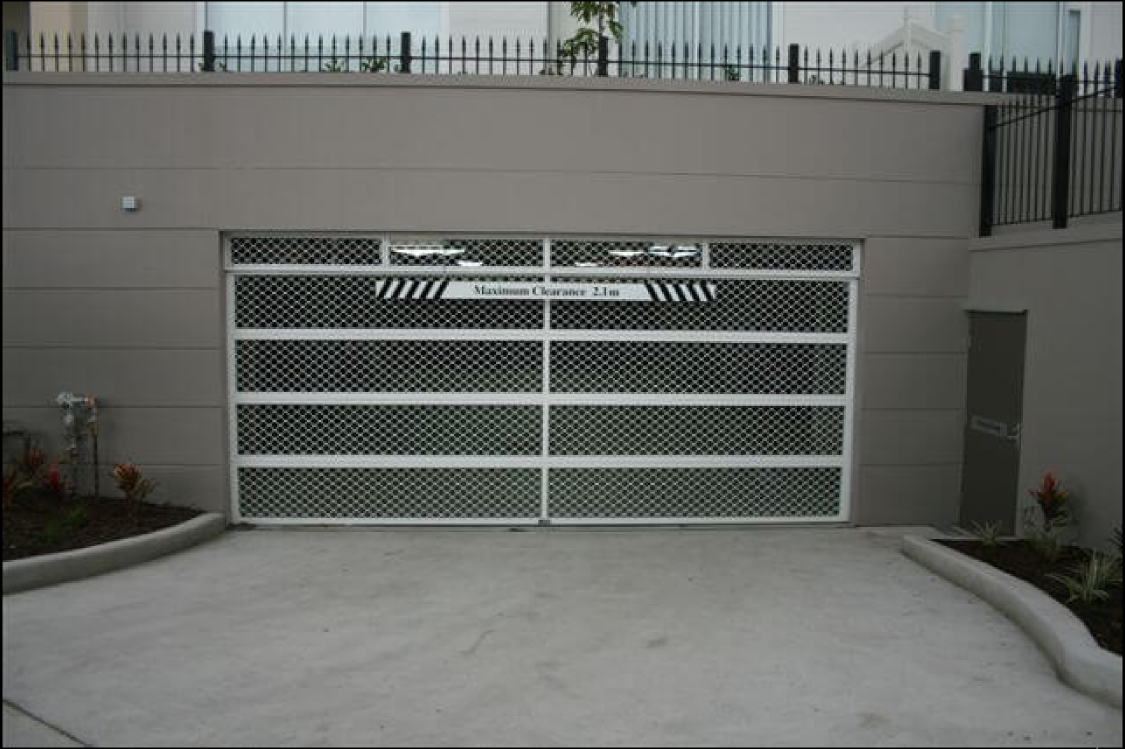
$\Rightarrow$ floors -1, 1, 2 likely unguarded (?)


Maximum Clearance 2.1m

Getting inside

Garage door requires remote clicker + produces beeping sound when open...

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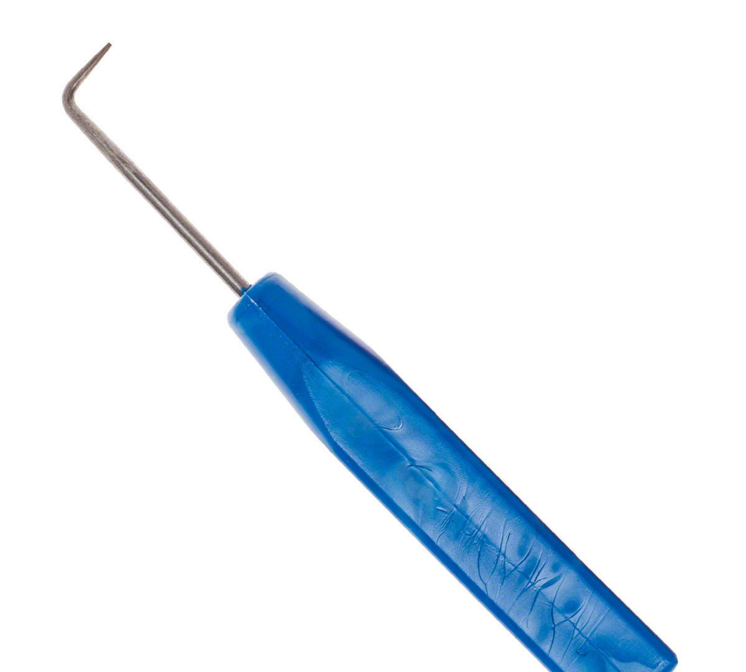
Garage door requires remote clicker + produces beeping sound when open...

Noticed the door on the side?

Introducing: the Traveller's hook



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So here we are in the garage. A few cars.

There are no cameras. We could cut the wires from the beeper and get vehicles in/out.
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And we can continue. The only way in is the lift.

Getting inside...

But the lift requires a badge...

Getting inside...

Did you notice the keyhole on the side?

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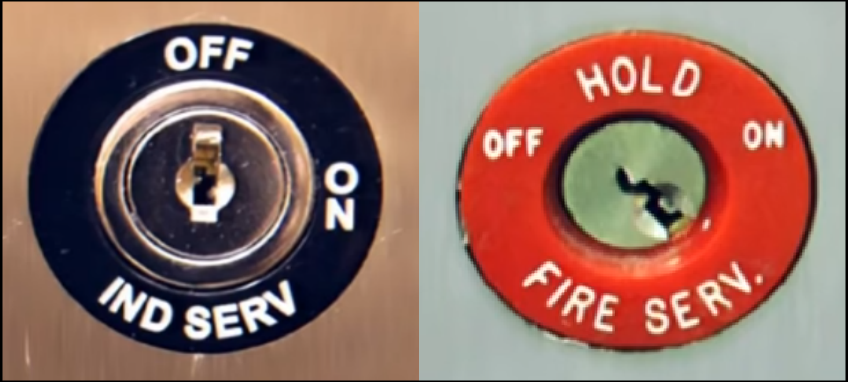

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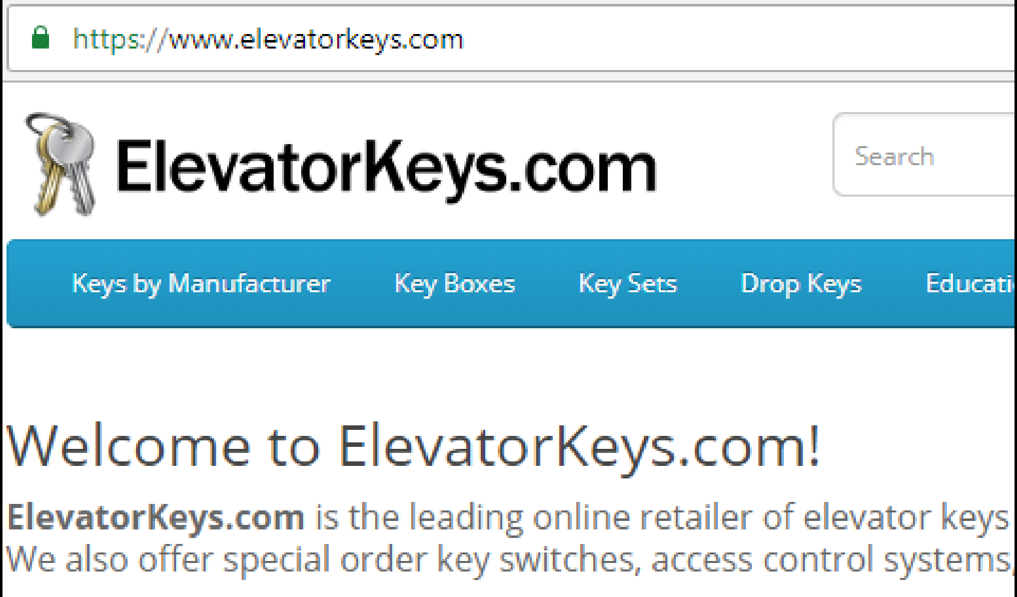

https://www.elevatorkeys.com

Welcome to ElevatorKeys.com!

ElevatorKeys.com is the leading online retailer of elevator keys
We also offer special order key switches, access control systems,

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  - The elevator panel read "Management & IT, floor 2".

We're inside, now what?

2nd floor is essentially a corridor

- Several rooms on both sides, only some names on tags
- No camera surveillance in the corridor (so likely none in rooms either)
- All rooms are badge controlled. No keylocks, no easy unlock.
- One room had an extra padlock (certainly interesting).

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We estimate we have about 7 hours ahead of us.

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  - Office computer
  - File cabinet...

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  - Printer/Scanner
- We look through the file cabinet and take a few pictures that we e-mail ourselves
- Through the printer's log and resend functionality
- Plug a PC on the Ethernet port and `nmap` the internal network

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Network is summarily segmented, a lot of redundancy, nothing obviously useable.
We are in the `mgmt` local network.

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- Deactivate antivir, open an exception on the firewall and install Poison Ivy with keylogging on. Just in case.

We're inside inside, now what what?

Let's go back to the padlocked room.

- Similar door as all the rest, so we can probably open it the same way
- But extra layer of protection in the form of a Master padlock

We need a break.

At this point, we've been at it for 4 hours and it's time for a break.

Come back in 15 mins

Don't try this at home

Alcohol is dangerous and the leading cause of death for the 25–35.

The harmful use of alcohol can also result in harm to other people, such as family members, friends, co-workers and strangers. Moreover, the harmful use of alcohol results in a significant health, social and economic burden on society at large.

It is associated with mental and behavioural disorders, including dependence, major diseases such as liver cirrhosis, cancers and cardiovascular diseases, as well as injuries resulting from violence and road clashes and collisions.

Shimming (video)

We’re in in in. What do we do now now now ?

This is indeed an interesting room: the main network equipment room.

- Servers on racks (that we could just unplug and run away with)
- Alims (that we could just unplug and run away with)
- Routers (that we could... you get the idea)

We could in principle try to get inside the servers, run an Encase or a Volatility, to known about the info they are processing.

But we haven’t much time, and it’s unlikely to be high-value (and we can come back later anyway).

The Cisco in the room

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(Minimal adjustments were needed to) get `root` access on that router.

Change configuration, set-up a connect-back tunnel to one of our IPs in Brazil.

Gotta catch'em all

At this point we are fairly confident that we have the bulk of the IT network under control, with RAT, keylogging, and untethered remote network acess.

We have physical access, and in all likelihood we can always come back.

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Except...

Ground control to Major Tom

Ground floor is covered in cameras + armed guards.

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Are the camera network-connected?

Ground control to Major Tom

Ground floor is covered in cameras + armed guards.

Are the camera network-connected? Yes they are! (thank you nmap)

Google-fu “D-Link DCS-7410” (shodan: dcs-lig-httpd)

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“It will execute any command you want” [CVE-2013-1599]

Craig Heffner, BlackHat USA 2013

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⇒ Get the admin password in your browser

⇒ Get the video feed live in your browser

Your Google-fu is strong

“It will execute any command you want” [CVE-2013-1599]
Craig Heffner, BlackHat USA 2013

`http://192.168.1.101/cgi-bin/rtpd.cgi?reboot`

`http://192.168.1.101/cgi-bin/rtpd.cgi?echo&AdminPasswd_ss|tdb`

⇒ Get the admin password in your browser
⇒ Get the video feed live in your browser

Oh and it’s RTP is UDP, so I can inject from anywhere in the network.

Peekaboo I see you

So now we know where the guards are (confirming $2 + 1$) and we can see what they see.

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We can also, in principle, inject a video stream or at least break it.

Also the guys are not leaving. If we had time and motivation, we'd go Captain Disillusion style

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This is of course an educated guesstimate, we're not selling any of it.

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How likely is it that employees smuggled the info out?

Testing the theory

We know that employees click on their e-mail attachments (boo) but could they be manipulated into leaking company data?

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- Someone sends the data anyway, and there's no access control besides badges

No protection against internal threats and no access logs + Successful experiment

⇒ Internal leak credible

We could have gone further

- Nothing prevented us from altering the hardware (or setting up cameras, microphones...). Hell we could have set the whole place on fire (no fire alarms).
- We could have gotten inside the network merely through e-mail manipulation, and perhaps wouldn't even need software
- The guards and cameras are guarding an empty room where nothing of value is stored
- The lawyer or contractor could simply be the author of the leak to begin with

Wrapping up

- Complete report on the many potential ways we could have gotten the info
- Complete report on the actual way we got some info, with proof
- Waited 1 week after the intrusion, to give them a chance to detect something (nope)
- Suggestions on improvements that would help make intrusion harder
- In particular: proper procedures and training, proper access control and logs, and rational use of resources
- Took about 2 years to implement the main suggested points

Wrapping up

Information security is not always only about computers

- Think globally and not just locally
- Play with technology, don't be mere users
- Have fun with the projects

And thank you so much for everything!

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