D3NH4CK
Hét security-event van Nederland

Linux Security

+ de APK voor systemen

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dearBytes
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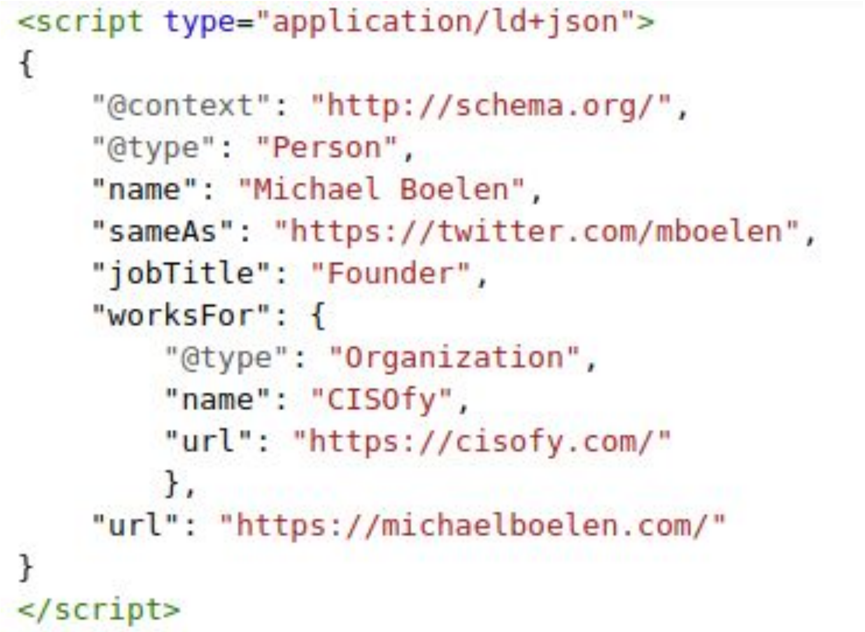
Agenda

Linux security

1. System hardening
2. Technical audits
3. Automation

Michael Boelen



```
<script type="application/ld+json">
{
	"@context": "http://schema.org/",
	"@type": "Person",
	"name": "Michael Boelen",
	"sameAs": "https://twitter.com/mboelen",
	"jobTitle": "Founder",
	"worksFor": {
		"@type": "Organization",
		"name": "CISOfy",
		"url": "https://cisofy.com/"
		},
	"url": "https://michaelboelen.com/"
}
</script>
```

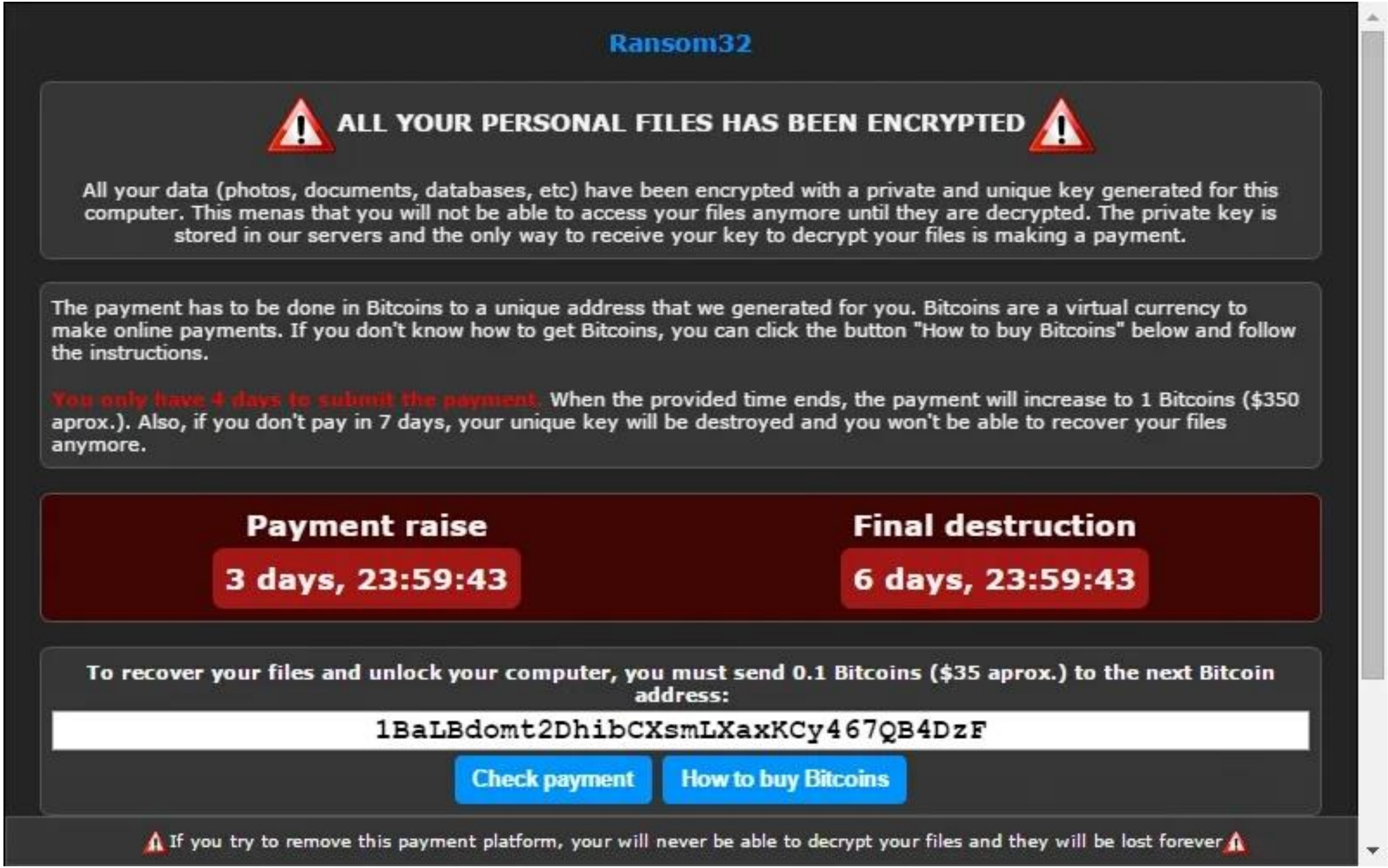
Linux security

Areas	Core	Resources	Services	Environment
System Hardening	Boot Process Containers Frameworks Kernel Service Manager Virtualization	Accounting Authentication Cgroups Cryptography Logging Namespaces Network Software Storage Time	Database Mail Middleware Monitoring Printing Shell Web	Forensics Incident Response Malware Risks Security Monitoring System Integrity
Security Auditing				
Compliance				

System Hardening

Security 101

- Ongoing process
- Prevention || Detection
- React and mitigate:
  - ○ Hearthbleed
  - ○ Spectre and Meltdown



Ransom32

ALL YOUR PERSONAL FILES HAS BEEN ENCRYPTED

All your data (photos, documents, databases, etc) have been encrypted with a private and unique key generated for this computer. This menas that you will not be able to access your files anymore until they are decrypted. The private key is stored in our servers and the only way to receive your key to decrypt your files is making a payment.

The payment has to be done in Bitcoins to a unique address that we generated for you. Bitcoins are a virtual currency to make online payments. If you don't know how to get Bitcoins, you can click the button "How to buy Bitcoins" below and follow the instructions.

You only have 4 days to submit the payment. When the provided time ends, the payment will increase to 1 Bitcoins ($350 aprox.). Also, if you don't pay in 7 days, your unique key will be destroyed and you won't be able to recover your files anymore.

Payment raise

3 days, 23:59:43

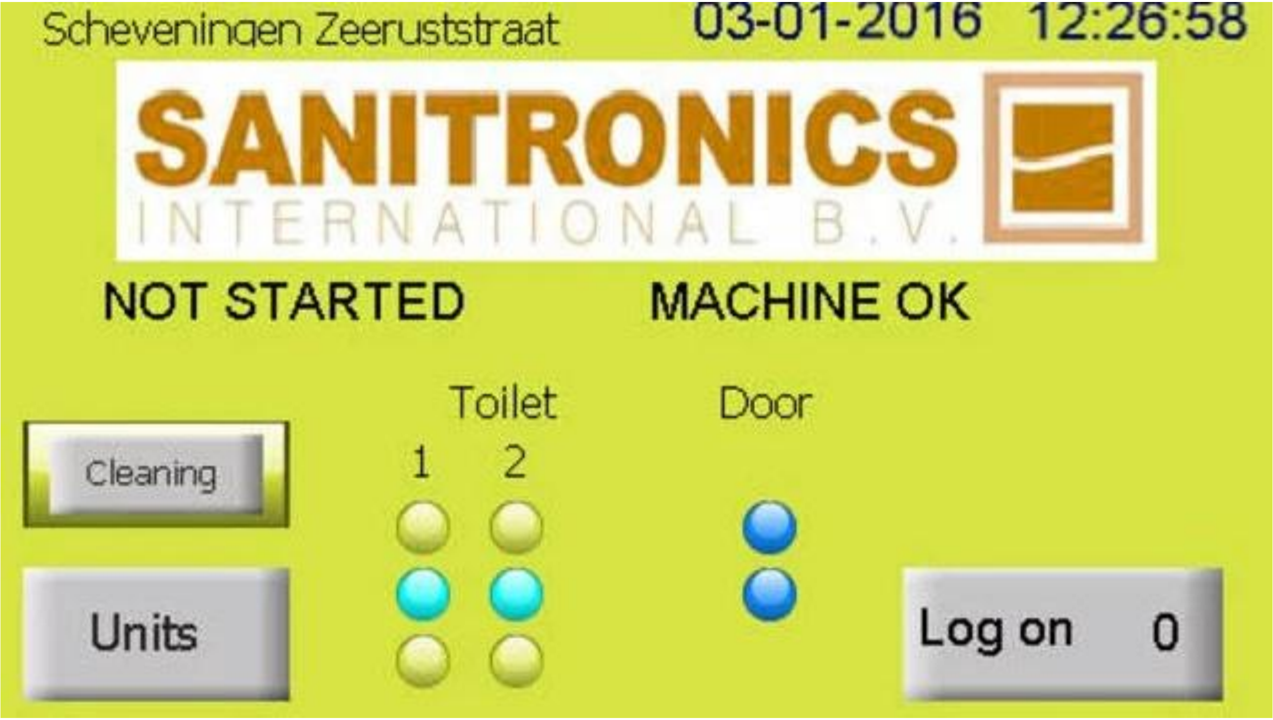
Final destruction

6 days, 23:59:43

To recover your files and unlock your computer, you must send 0.1 Bitcoins ($35 aprox.) to the next Bitcoin address:

1BaLBdomt2DhibCXsmLXaxKCy467QB4DzF

If you try to remove this payment platform, your will never be able to decrypt your files and they will be lost forever



Scheveningen Zeeruststraat 03-01-2016 12:26:58

SANITRONICS INTERNATIONAL B.V.

NOT STARTED MACHINE OK

Hardening 101

Defenses

- New
- Existing
- Reduce weaknesses

  (= attack surface)

Photo Credits: http://commons.wikimedia.org/wiki/User:Wilson44691

Hardening

Resources

- Center for Internet Security (CIS)
- NSA → NIST
- OWASP
- Vendors
- *The Internet*

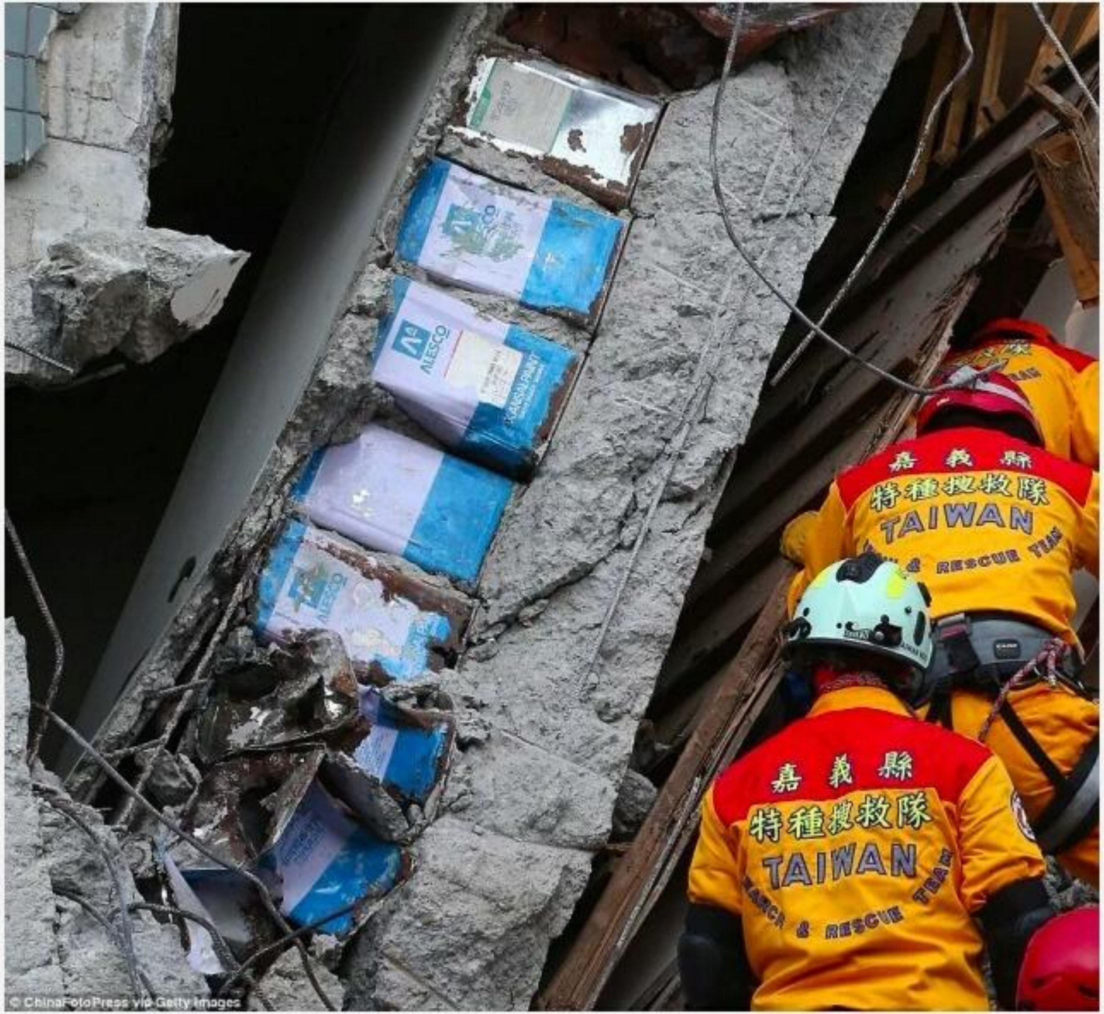
North-South
Road
Isenga
Dunla
WESTFOLD
Emnet
Emnet
Emnet

Auditing

Auditing

Why?

- Quality
- Assurance



© ChinaFotoPress via Getty Images

Tin cans within the structural columns in the Weiguan Jinlong apartment complex in Taiwan (via China Foto Press)

Audit (or some pentests)

Typically:

```
10 Run vulnerability scanner
20 Apply fix
30 goto 10
```

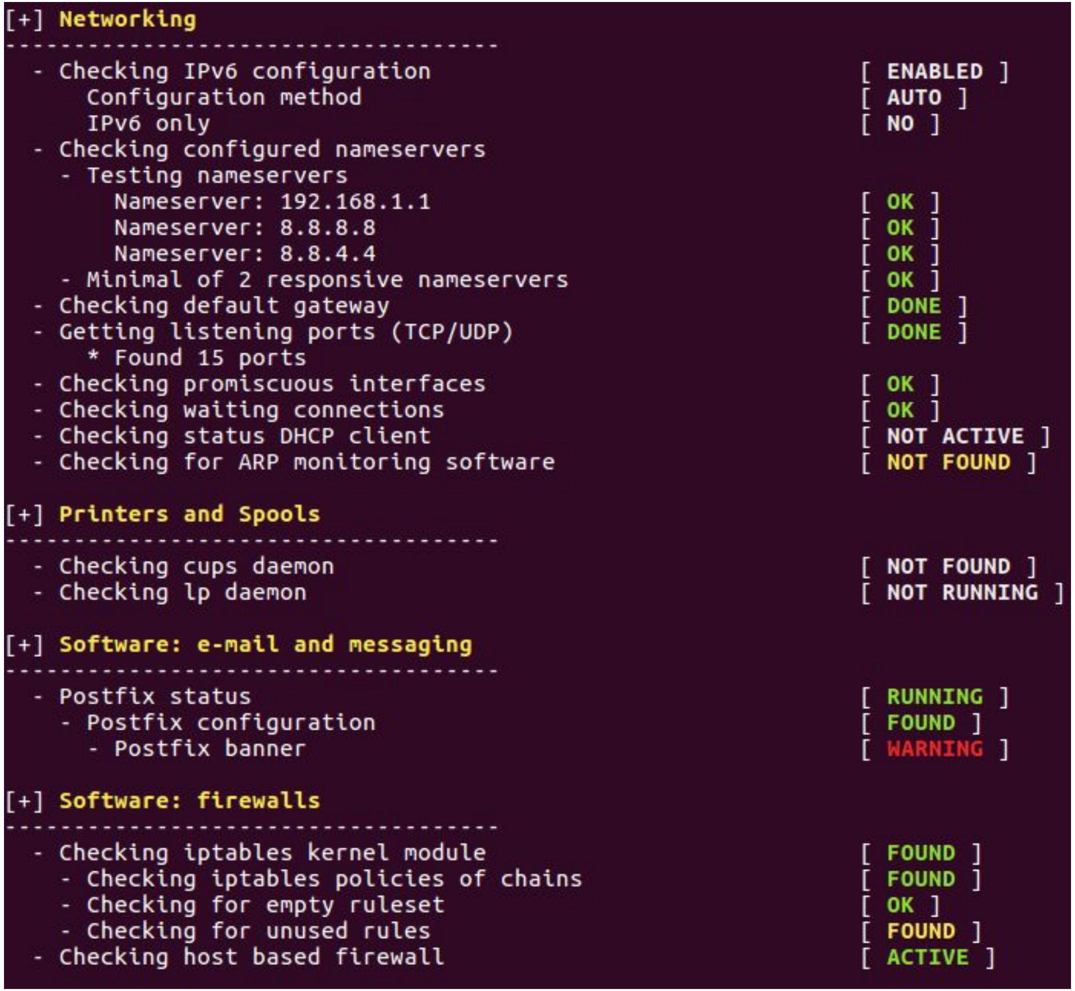
Audit

Better:

```
10 Select target(s)
20 Perform audit
30 Risk analysis
40 Define automation steps
50 Implement hardening
60 goto 10
```

Automation

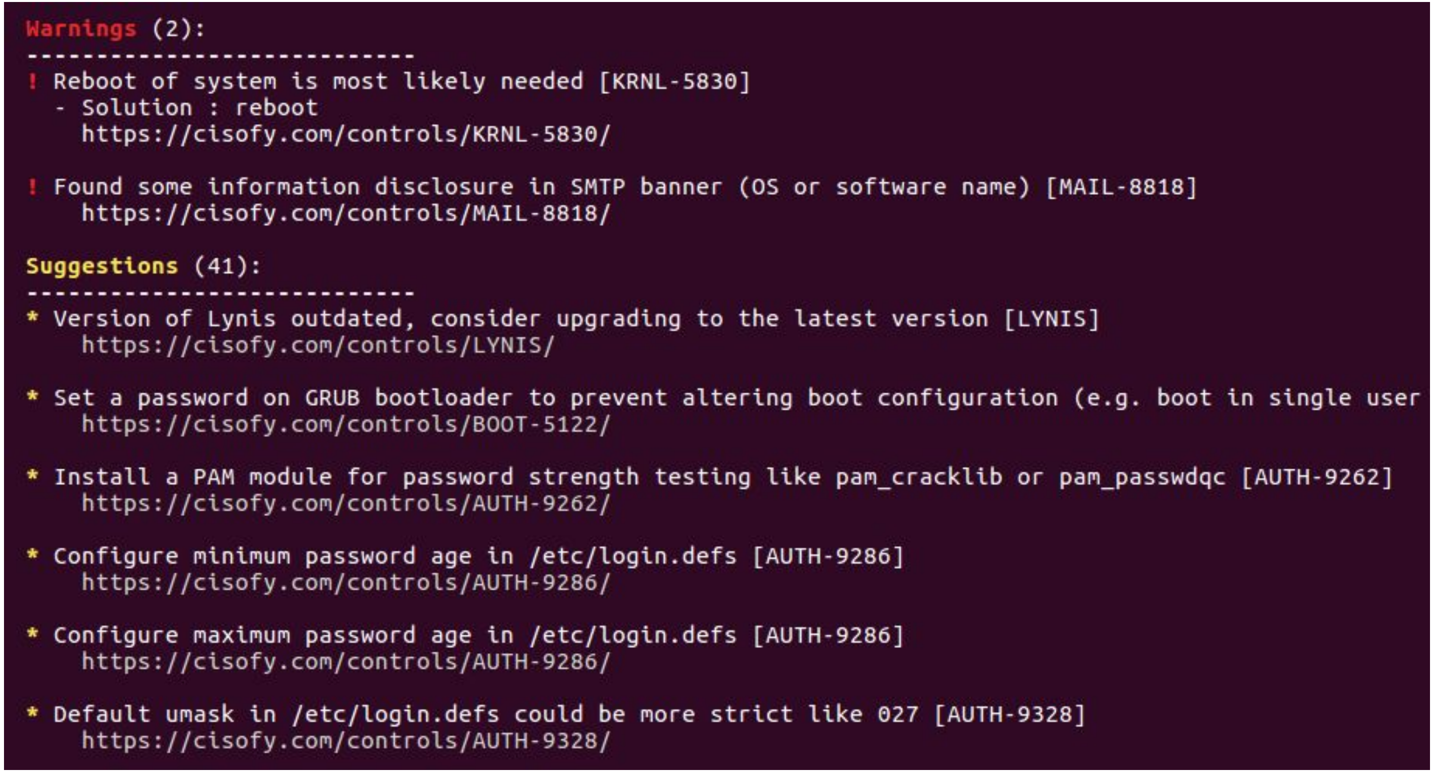
Lynis



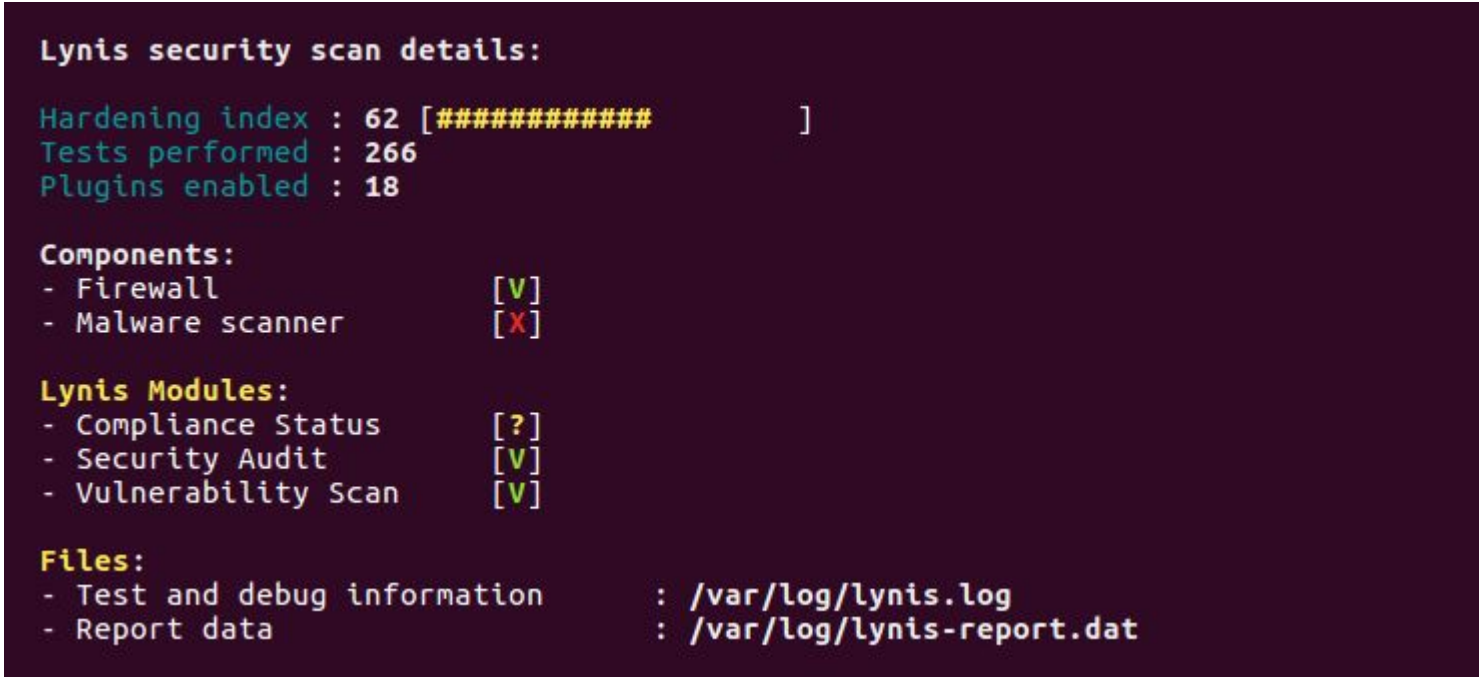
```
[+] Networking
------------------------------------
  - Checking IPv6 configuration                               [ ENABLED ]
      Configuration method                                    [ AUTO ]
      IPv6 only                                               [ NO ]
  - Checking configured nameservers
    - Testing nameservers
        Nameserver: 192.168.1.1                               [ OK ]
        Nameserver: 8.8.8.8                                   [ OK ]
        Nameserver: 8.8.4.4                                   [ OK ]
    - Minimal of 2 responsive nameservers                     [ OK ]
  - Checking default gateway                                  [ DONE ]
  - Getting listening ports (TCP/UDP)                         [ DONE ]
      * Found 15 ports
  - Checking promiscuous interfaces                           [ OK ]
  - Checking waiting connections                              [ OK ]
  - Checking status DHCP client                               [ NOT ACTIVE ]
  - Checking for ARP monitoring software                      [ NOT FOUND ]

[+] Printers and Spools
------------------------------------
  - Checking cups daemon                                      [ NOT FOUND ]
  - Checking lp daemon                                        [ NOT RUNNING ]

[+] Software: e-mail and messaging
------------------------------------
  - Postfix status                                            [ RUNNING ]
    - Postfix configuration                                   [ FOUND ]
      - Postfix banner                                        [ WARNING ]

[+] Software: firewalls
------------------------------------
  - Checking iptables kernel module                           [ FOUND ]
    - Checking iptables policies of chains                    [ FOUND ]
    - Checking for empty ruleset                              [ OK ]
    - Checking for unused rules                               [ FOUND ]
  - Checking host based firewall                              [ ACTIVE ]
```

How it works

- Initialization
- Run
  - Helpers
  - Plugins
  - Tests
- Show audit results



```
Warnings (2):
----------------------------
! Reboot of system is most likely needed [KRNL-5830]
  - Solution : reboot
    https://cisofy.com/controls/KRNL-5830/

! Found some information disclosure in SMTP banner (OS or software name) [MAIL-8818]
    https://cisofy.com/controls/MAIL-8818/

Suggestions (41):
----------------------------
* Version of Lynis outdated, consider upgrading to the latest version [LYNIS]
    https://cisofy.com/controls/LYNIS/

* Set a password on GRUB bootloader to prevent altering boot configuration (e.g. boot in single user
    https://cisofy.com/controls/BOOT-5122/

* Install a PAM module for password strength testing like pam_cracklib or pam_passwdqc [AUTH-9262]
    https://cisofy.com/controls/AUTH-9262/

* Configure minimum password age in /etc/login.defs [AUTH-9286]
    https://cisofy.com/controls/AUTH-9286/

* Configure maximum password age in /etc/login.defs [AUTH-9286]
    https://cisofy.com/controls/AUTH-9286/

* Default umask in /etc/login.defs could be more strict like 027 [AUTH-9328]
    https://cisofy.com/controls/AUTH-9328/
```



```
Lynis security scan details:

Hardening index : 62 [############        ]
Tests performed : 266
Plugins enabled : 18

Components:
- Firewall               [V]
- Malware scanner        [X]

Lynis Modules:
- Compliance Status      [?]
- Security Audit         [V]
- Vulnerability Scan     [V]

Files:
- Test and debug information      : /var/log/lynis.log
- Report data                     : /var/log/lynis-report.dat
```

Why Lynis?

Flexibility

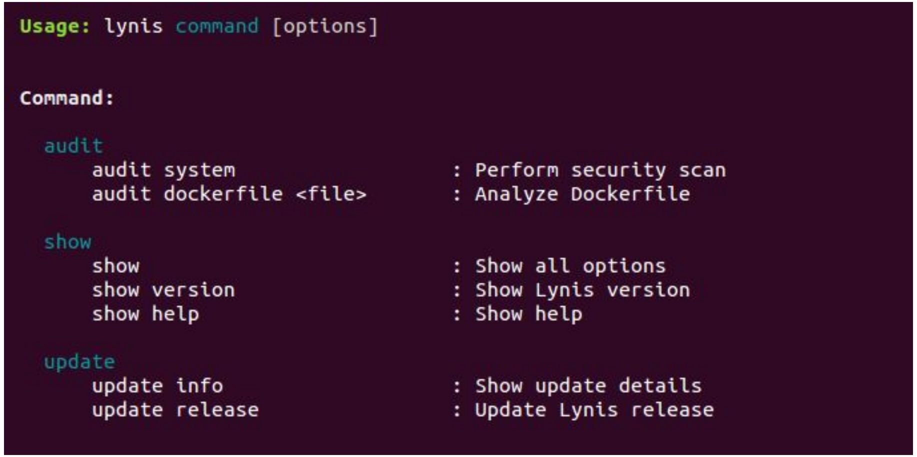
- No dependencies*
- Understandable
- Create your own tests

* Besides common tools like awk, grep, ps

Why Lynis?

Three pillars

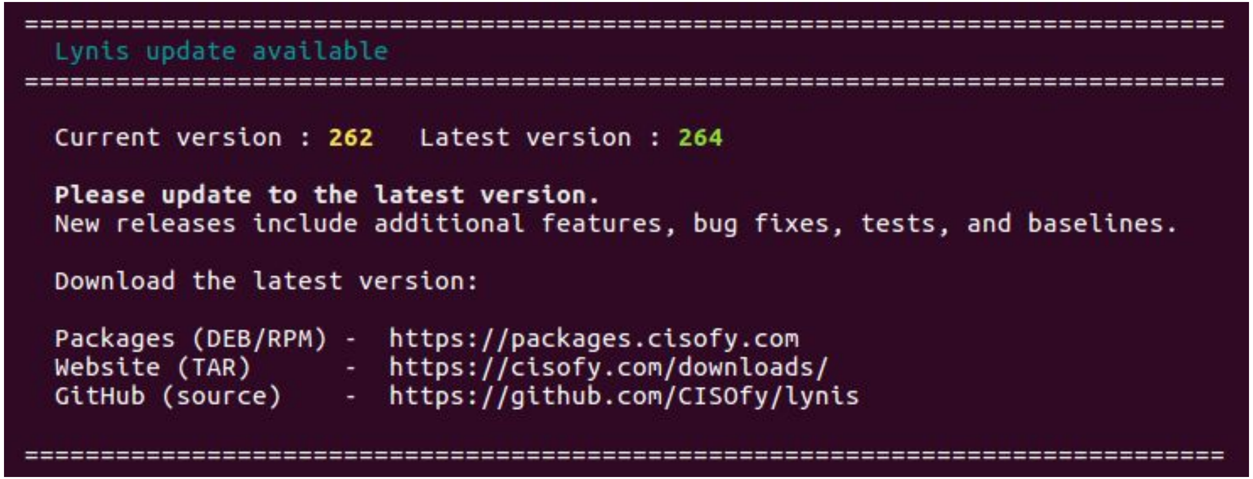
1. First impression
2. Keep it simple
3. Next step



```
Usage: lynis command [options]


Command:

  audit
      audit system                  : Perform security scan
      audit dockerfile <file>       : Analyze Dockerfile

  show
      show                          : Show all options
      show version                  : Show Lynis version
      show help                     : Show help

  update
      update info                   : Show update details
      update release                : Update Lynis release
```

Why Lynis?

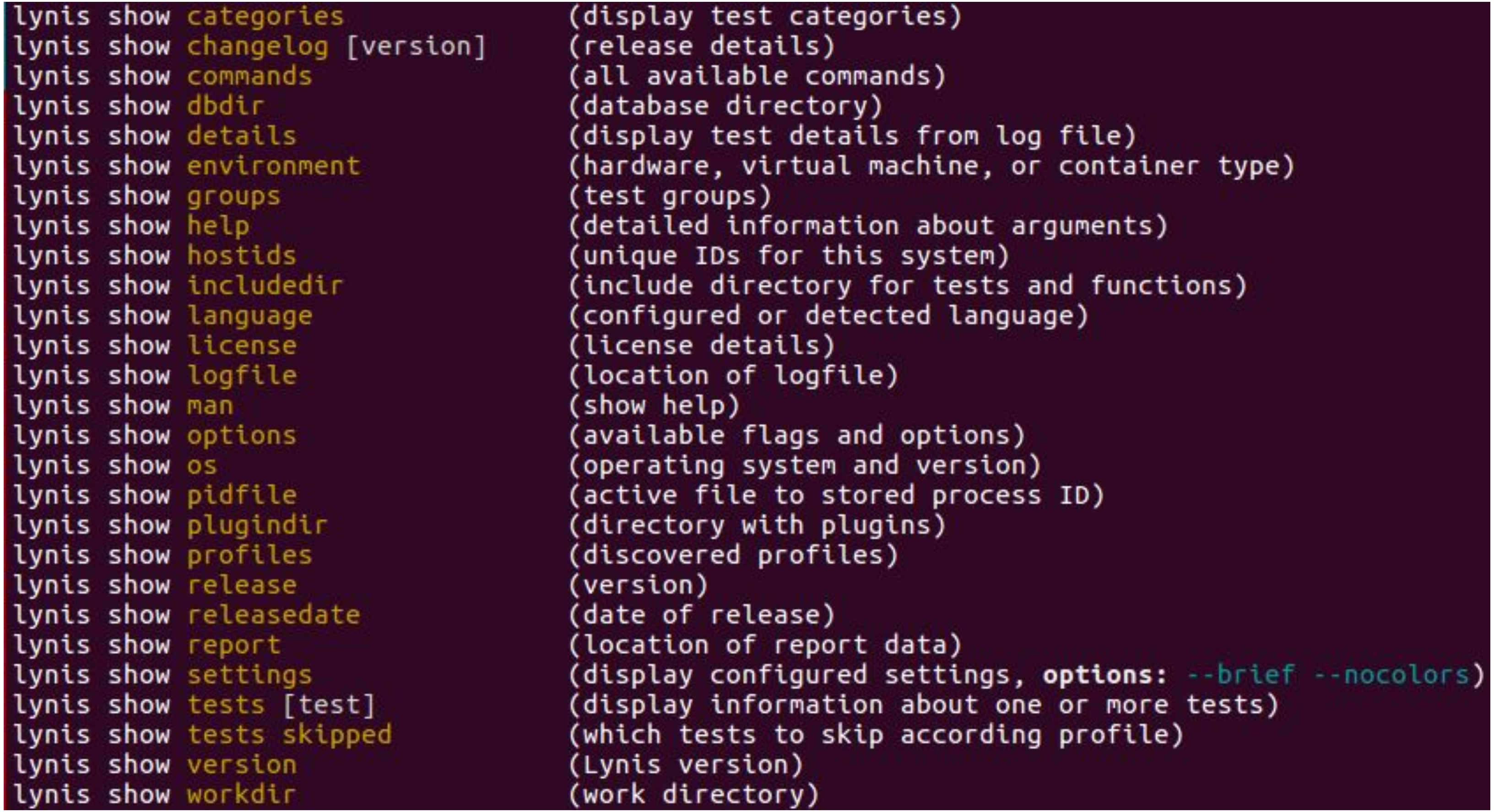
Next step:



```
================================================================================
  Lynis update available
================================================================================

  Current version : 262   Latest version : 264

  Please update to the latest version.
  New releases include additional features, bug fixes, tests, and baselines.

  Download the latest version:

  Packages (DEB/RPM) -  https://packages.cisofy.com
  Website (TAR)      -  https://cisofy.com/downloads/
  GitHub (source)    -  https://github.com/CISOfy/lynis

================================================================================
```

Running Lynis

- lynis
- lynis audit system
- lynis show
- lynis show commands



```
lynis show categories                (display test categories)
lynis show changelog [version]       (release details)
lynis show commands                  (all available commands)
lynis show dbdir                     (database directory)
lynis show details                   (display test details from log file)
lynis show environment               (hardware, virtual machine, or container type)
lynis show groups                    (test groups)
lynis show help                      (detailed information about arguments)
lynis show hostids                   (unique IDs for this system)
lynis show includedir                (include directory for tests and functions)
lynis show language                  (configured or detected language)
lynis show license                   (license details)
lynis show logfile                   (location of logfile)
lynis show man                       (show help)
lynis show options                   (available flags and options)
lynis show os                        (operating system and version)
lynis show pidfile                   (active file to stored process ID)
lynis show plugindir                 (directory with plugins)
lynis show profiles                  (discovered profiles)
lynis show release                   (version)
lynis show releasedate               (date of release)
lynis show report                    (location of report data)
lynis show settings                  (display configured settings, options: --brief --nocolors)
lynis show tests [test]              (display information about one or more tests)
lynis show tests skipped             (which tests to skip according profile)
lynis show version                   (Lynis version)
lynis show workdir                   (work directory)
```

Lynis Profiles

Optional configuration

- Default.prf
- Custom.prf
- Other profiles

Automation

Dealing with findings

- Log + website
- Create hardening snippet
- Automate via Chef, Puppet, Salt, etc.

Let’s summarize

Summary

Take action:

1. Perform regular scans
2. Get that low-hanging fruit
3. Automate the outcome

Success!

You finished this presentation

Questions?

Connect

- Twitter: @mboelen
- LinkedIn: Michael Boelen

Relevant project: https://LinuxSecurity.Expert

(security tools, checklists, guides)

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Hét security-event van Nederland

www.denhack.nl

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