

SECRETARÍA DE ESTADO DE DIGITALIZACIÓN E INTELIGENCIA ARTIFICIAL



# Webinar: Password managers

**Exercises** 



secretaría de estado de digitalización e inteligencia artificial





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### **1. PRACTICAL EXERCISES**

### **1.1. Export passwords**

In this exercise we are going to save in a file all the stored passwords in order to be able to import them in the future or to have an intermediate structured file that we can use in our favourite programming languages.

#### 1.1.1. Export from BitWarden.

We start the application by entering our master password.

|      |      |      |         |        |       | Bitwa                                      | arden              |        |      |   |  | - 0 😣 |
|------|------|------|---------|--------|-------|--|--------------------|--------|------|---|--|-------|
| File | Edit | View | Account | Window | Help  |  |                    |        |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         |        |       | (  | 1                  |        |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         |        |       | Your vault is locked                       | . Verify your mast | er     |      |   |  |       |
|      |      |      |         |        |       | password t                                 | o continue.        |        |      |   |  |       |
|      |      |      |         |        |       | Master Password                            |                    |        |      |   |  |       |
|      |      |      |         |        |       |  | 12                 | ۲      |      |   |  |       |
|      |      |      |         |        |       | Logged in as xaxef414100<br>bitwarden.com. | @lagsixtome.com on |        |      |   |  |       |
|      |      |      |         |        |       | bitwarden.com.                             |                    |        |      |   |  |       |
|      |      |      |         |        |       | 🔒 Unlock                                   | Log Out            | 1      |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         |        |       |  |                    |        |      |   |  |       |
|      |      |      |         | F      | iqure | 1 - Start screen w                         | vith the maste     | er pas | swor | d |  |       |

Once we are authenticated, we click on "File" and "Export Vault".



#### Figure 2 - Export vault

You will again be asked for our master password and a data format for export: "json" or "csv". We proceed to click on the button in the red box.

|   | Bitwarden  |     |
|---|--|-----|
| File Edit Vie   | ew Account Window Help   |     |
| III All Items   | Q. Search Vault  |     |
| ★ Favorite:   | EXPORT VAULT   |     |
| TYPES   | File Format  |     |
| <ul> <li>♀ Login</li> <li>금 Card</li> <li>Identity</li> </ul> | Master Password  |     |
|   | Enter your master password to export your vault data.<br>WARNING: This export contains your vault data in an unencrypted format. You<br>should not store or send the exported file over unsecure channels (such as email).<br>Delete it immediately after you are done using it. | den |
|   | Cancel   |     |

Figure 3 - Export Vault, download

Finally, it will ask us for a file name so that it can be saved to disk. We will have successfully exported the entire safe.



#### 1.1.2. Export from KeePass.

We open the KeePass application with our master password and click on "File" and "Export".

|          |   |                   |                                      | Base de datos.kdbx - KeePass                                |     |
|----------|---|-------------------|--------------------------------------|---|-----|
| File     | Group Entry<br>New                              | Find Vi<br>Ctrl+N | ew Tools Help<br>Q 🕅 -               | <b>*</b>  |     |
|          | Open<br>Open Recent                             | +<br>+            | Title<br>Internet                    | User Name   | Pa  |
|          | Close<br>Save<br>Save As                        | Ctrl+W<br>Ctrl+S  | Google mail<br>Twitter<br>Reddit.com | ejemplo01user@gmail.com<br>ejemplo02user<br>usuario_ejemplo | *** |
| <b>%</b> | Database Settings<br>Change Master Key<br>Print |                   |                                      | usuano_ejempio  | *** |
| 2<br>2   | Import<br>Export                                |                   |                                      |   |     |
| <b>a</b> | Synchronize<br>Lock Workspace<br>Exit           | Ctrl+L<br>Ctrl+Q  |                                      |   |     |

Figure 5 - Exporting with KeePass

By clicking on "Export" we'll see the export file options available.



|   | Export File/Data 😣   |                                     |
|---|--|-------------------------------------|
| File Group Entry Fine   | Export File/Data<br>Export data to an external file.   | URL                                 |
| <ul> <li>➡ General</li> <li>➡ Windows</li> <li>☑ Red</li> <li>➡ Internet</li> <li>➡ eMail</li> <li>ℜ Banco</li> </ul> | Format<br>KeePass<br>(a) KeePass CSV (1.x)<br>(a) KeePass KDB (1.x)  | https://a<br>https://t<br>https://v |
| Papelera de reciclaje   | <ul> <li>Received to be (1.8)</li> <li>ReePass KDBX (2.2)</li> <li>KeePass KDBX (2.34, Old Format)</li> <li>KeePass XML (2.x)</li> <li>General</li> <li>Customizable HTML File</li> <li>Transform using XSL Stylesheet</li> <li>Windows Favorites (Folder 'KeePass')</li> <li>Windows Favorites (Root Directory)</li> <li>Browser</li> <li>Mozilla Bookmarks HTML</li> </ul> |                                     |
|   | File   |                                     |
| 0 of 4 selected Exporting   | OK Cancel  |                                     |

Figure 6 - Options for selecting export files

If we want to exchange with another entity or person, we will provide them with the latest version of the new KBDX format, in this case KeePass KDBX 2.x. Afterwards, we will select where we want to save the file and we will have it available in that location.



|   |                 |                              | Export File/D  | )ata    |        | 8   |                                    |       |
|---|-----------------|------------------------------|----------------|---------|--------|-----|------------------------------------|-------|
| Base de datos                                     | ry Fin          | Export File                  |                | file.   | DV     |     | URL                                | Notes |
| General   | _               | Export: KeePa                | ss KDBX (2.x)  |         | ■ 😣    | _   |                                    |       |
| Red<br>Internet                                   | Save in: 📘      | -                            |                | - 🗂 🖬 🕈 |        |     | https://account<br>https://twitter |       |
| 😂 eMail<br>% Banco                                |                 | Descargas<br>Documentos      |                |         |        |     | https://www.red                    |       |
| <ul> <li>Banco</li> <li>Papelera de re</li> </ul> | Recently        | Escritorio                   |                |         |        |     |                                    |       |
|   |                 | Música<br>Plantillas         |                |         |        |     |                                    |       |
|   |                 | Público                      |                |         |        |     |                                    |       |
|   |                 | Vídeos<br>Base de datos.kdbx |                |         |        |     |                                    |       |
|   |                 |                              |                |         |        |     |                                    |       |
|   | My Computer     |                              |                |         |        |     |                                    |       |
|   |                 |                              |                |         | _      |     |                                    |       |
|   | My Network File | name: Base de datos          | kdbx           | -       | Save   |     |                                    |       |
|   |                 | e as type: KeePass KDBX      | (2.x) (*.kdbx) | -       | Cancel |     |                                    |       |
|   | File            | oort to:                     |                |         |        | 1 - |                                    | Þ     |
|   | EXP             |                              |                |         |        | 4   |                                    |       |
|   |                 |                              |                |         |        |     |                                    |       |

Figure 7 - Location of the export file







## 2. RESEARCH INVESTIGATION

### 2.1. Using the Password Generator

In this exercise we will see how we can make use of the password generator for both BitWarden and KeePass.

#### 2.1.1. Password generator in BitWarden

We open BitWarden, authenticate ourselves with the master password and access the "View" and "Password" menu.

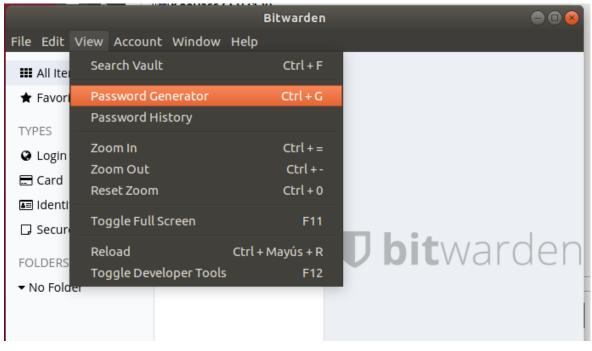


Figure 8 - Password generator in BitWarden

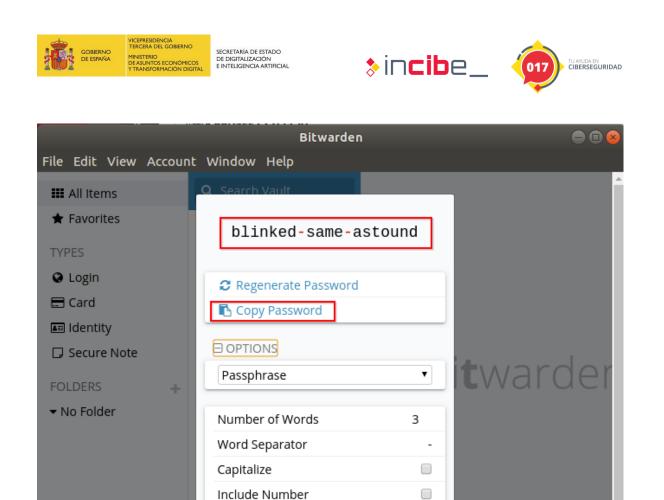
In BitWarden we have two options: "Password" and "Passphrase". The difference between the two is the readability provided by the second option, since it will build a readable sentence in blocks of columns that we define. The generator allows us to generate passwords between a set of length defined by us between special characters, upper or lower case, numbers, etc....



|                       | Dicwaruen             |                   |
|-----------------------|-----------------------|-------------------|
| File Edit View Accoun | t Window Help         |                   |
| III All Items         | Q Search Vault        | -<br>-            |
| ★ Favorites           | to7MvH7bkMXkxA        |                   |
| TYPES                 |                       |                   |
| O Login               | C Regenerate Password |                   |
| 🚍 Card                | Copy Password         |                   |
| 📧 Identity            |                       | ·                 |
| 🕞 Secure Note         |                       |                   |
| FOLDERS +             | Password <b>v</b>     | i <b>t</b> warder |
| ▼ No Folder           |                       |                   |
| • No Folder           | Length 14 =           |                   |
|                       | A-Z                   |                   |
|                       | a-z 🕑                 |                   |

Figure 9 - Classical password generation with options

In the second option, "passphrase" we see that it constructs three words separated by a hyphen so that we can easily remember it. In any case, in both options, we have the possibility to save the password in the clipboard with "Copy password".



2.1.2. KeePass Password Generator

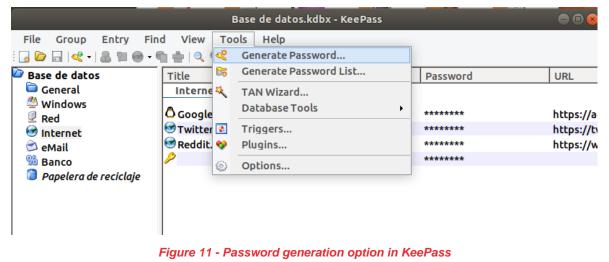
### Once authenticated with the master password, we proceed

Close

Once authenticated with the master password, we proceed to click on "Tools" and "Generate password".

Figure 10 - Passwordphrase

Question (BitWarden): How would you generate a 5-column "passphrase" key?







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In this case, the options and preferences are much broader than in BitWarden and include the function to generate a certain number of passwords, in case we might need them. For example, for the "custom" profile we have the following options.

| Pass  | word Generator                              | Ø |
|---|---|---|
| Password Generation                             |   |   |
| Settings Advanced Preview                       |   | 1 |
| Profile: (Custom)                               |   |   |
| Current settings                                |   |   |
| ○ <u>G</u> enerate using character set:         |   |   |
| Length of generated password:                   | 20  |   |
| <u> Upper-case</u> (A, B, C,)                   | Г <u>S</u> pace ( )                         |   |
| I⊽ Lo <u>w</u> er-case (a, b, c,)               | ☐ Sp <u>e</u> cial (!, \$, %, &,)           |   |
| ☑ <u>D</u> igits (0, 1, 2,)                     | □ <u>B</u> rackets ([, ], {, }, (, ), <, >) |   |
| 厂 <u>M</u> inus (-)                             | Γ Latin-1 Supplement (Ä, μ, ¶,)             |   |
| □ Underline (_)                                 |   |   |
| Also jnclude the following characters:          | :   |   |
|   |   |   |
| Generate using pattern:                         |   |   |
| h{64}   |   |   |
| ,<br>□ <u>R</u> andomly permute characters of p | password                                    |   |
| C Generate using custom algorithm:              |   |   |
| (None)  | ✓ (3)                                       |   |
| 1   |   |   |

Figure 12 - Password generation options

Question (KeePass): How would you generate a 256-bit Hex key?





### 3. SOLUTION

**Question**: How would you generate a five (5) column "passphrase" type key?

In this case we would go to "View", "Password Generator" (CTRL+G) select "Word Numbers" and set it to four. Later we can set the separate one or leave it as a dash.

| Edit View Account | Window Help                            |             |
|-------------------|--|-------------|
| All Items         | Q Search Vault                         |             |
| -avorites<br>ES   | clad-humorless-immortal-g<br>luten-lid |             |
| _ogin             | C Regenerate Password                  |             |
| Card              | Copy Password                          |             |
| dentity           |  |             |
| Secure Note       |  |             |
| .DERS +           | Passphrase •                           | <b>T</b> Wa |
| o Folder          | Number of Words 5                      |             |
|                   | Word Separator -                       |             |
|                   | Capitalize                             |             |
|                   | Include Number                         |             |
|                   | Close                                  |             |

Figure 13 - Generation of 5-column passphrase







Question (KeePass): How would you generate a 256-bit Hex key?

In this case we would change the custom profile to a "256-Bit Hex Key (Integrated)" profile as shown in the image below.

| Pa  | ssword Generator                             | 8 |
|---|--|---|
| Password Generation                               | on Options<br>erties of generated passwords. |   |
| Settings Advanced Preview                         |  |   |
| Profile: (Custom)                                 |  |   |
| Current (Custom)<br>(Automatically generated pass | words for pow optrios)                       |   |
| C Gene Hex Key - 40-Bit (built-in)                | words for new enches)                        |   |
| Len Hex Key - 128-Bit (built-in)                  |  |   |
| Hex Key - 256-Bit (built-in)                      | )  |   |
| ☑ Lo <u>w</u> er-case (a, b, c,)                  | └ Sp <u>e</u> cial (!, \$, %, &,)            |   |
| ☑ <u>D</u> igits (0, 1, 2,)                       | □ <u>B</u> rackets ([, ], {, }, (, ), <, >)  |   |
| └─ <u>M</u> inus (-)                              | Γ L <u>a</u> tin-1 Supplement (Ä, μ, ¶,)     |   |
| □ Underline (_)                                   |  |   |
| Also jnclude the following characte               | rs:  |   |
|   |  |   |

Figure 14 - 256-Bit Hex generation

To see the result, let's go to the "Preview" tab.



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#### Password Generator Password Generation Options Here you can define properties of generated passwords. Settings Advanced Preview Here you see a few sample passwords matching the rules specified on the first tab pages. 1a7f3bd7ceb0dfbf52f3196b99fc74525ad372ba912f49efca2360966194ad13 0d4847cd973d372ec0e7b08ab162e698ecce2321e780a4872b6b8aadf866d3d4 82c8579370806b85136b6597c69b90b454d3a6d68fc7367f933d29cd19d86cc6 891542e9a0d239094b7c536773dbaa1aaad3a0338457e8863303f8d0aa2f84ce 42edb86b4af934f8ac22c986cc0a91d6e676a4695345e75dc5d2ad7cc0c51a8f a88d36b0120bcb0b8a0cdcea6fe32965da8f614d174694a3ec304770f1eb2deb ab9b3b6ec11aae528ef258dcb37d548aa575172ba5a3960e5e3b5c1365426830 f3bc8dbad5835d7c1053ee782e10f229820ddb3a59cb0d4f1c2d5d3a5660ad51 c16c483fb58aa10caeb1181c26c4a9aa6c22013f1b2ffeedf95589a49653e2df 92ee35316d6708452e7702fc57a16d5d0b08ebed8b651269aac8ad2c5a6d25c3 7020206d21ad278a06924584537f6cc483cf0ff4750143a8f19e82cfd1184134 2d82bf5afd90bdf9b8444c22df63bd77f2c56017220493f514be9832f636cb5a 183ab9b0e470aa2bb27cd52a4d9b41ed1b193e00b0d1eef77c5dc15bbfa6f3bb 22c0ec7a75b8af6144f5dab4de31562d8be90f1eb9a416e0a2368a55084e9796 531b5434544089a6f8b1d57bc455528302fa93ed42a5ebb9b8ac0f601f0b73d2 1e7403c20e0e31af20db2e5874be5e9974868572621364430affa0b4e5f6b6f0 82b6eb511abafed54dc62f26092b8145207f60c45c9428bf8632766a3af7e8d6 42317c21bccc5c2efde9a716bdbce174a2e1425253460ed5fac56e78a1caddf1 450009a5ea2d48eea545c99cf8e8bd8055561bcd11a2067135d4d44e3274f20f 2ac2eeead7464e028d0cb1832f63b789b59dee0dad62d0e6edfd5ec0cee29aa7 3896bc2668d814b828685141dd032de919f473dc8b845b765d411923cf62ae37 42d197f1b43827a4ed5599c88e68f3d0656fe96b03fa4c0a69c9ba554d309f40 8bcf5924b95c288c181534b83b845ac117be9e67cfd32370b90bb1cf24bba553 fae003560d8d2232467b0a80c8a3254058491214eed10fd94d2831fad58d3469 0affa55e495e879a42782861fb850dae343679f9f955c87a7409b32eabdf8023 21c2/bd1d33/60dbfba185eaaf1/8f7570552bf603fca219f30c9c51c/6e95 Help OK Cancel

Figure 15 - Password generation preview