

Here is a quick rundown of what happens

- 1. Embedded driver is dropped to disk
- 2. Registry key under HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services is created
- 3. The privilege SE\_PRIVILEGE\_ENABLED is acquired because it is necessary to load the driver
- 4. Driver is loaded using NtLoadDriver to avoid creating a service
- 5. The created Registry key is deleted (service not visible during execution)
- 6. Communication with the driver is via using DeviceloControl
- 7. For handle enumeration, NtQuerySystemInformation is called

## What you should also know

- 1. The behavior of the tool mimics that of ProcExp. ProcExp drops the driver to the disk, create registry key under HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services, calls NtLoadDriver, and then delete the registry key
- 2. You can specify the location to which the driver is dropped and the service name
- 3. When done, the app will unload the driver. The driver is unloaded by first recreating the registry keys and then calling NtUnloadDriver
- 4. The loaded driver is signed by MS
- 5. The process does not attempt to directly kill protected processes handles, it instructs ProcExp driver to kill them. You won't be accused of attempting to tamper with any processes

## **Further Research**

While the tool purpose is listing and killing handles, the opportunities are vast. It is possible to duplicate the handles to your own process instead of killing them. This could allow for deeper tampering where you write to files, fire events, hold mutexes. To support further research, I tried to make the code readable and split it to many methods to facilitate reuse, I also left a description on all ProcExp related methods. Feel free to reach out to me on Twitter or by Email

## **Credits**

- Author: Yasser Alhazmi (@Yas\_o\_h)
- Pavel Yosifovich: (@Zodiacon) mentioned to us during his awesome Windows
   Internals Course
   that kernel drivers like ProcExp might cause too much unintended damage
- Cornelis de Plaa <u>@Cn33liz</u> and Outflank Team <u>@OutflankNL</u>: for <u>Ps-Tools</u> and their outstanding Github repos, always informative
- Mark Russinovich: for ProcExp, and all Sysinternals tools!

