

ServiceProxy v1.1 Grasshopper Component User Guide

DRAFT



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1 Description

ServiceProxy is a Grasshopper component that provides a way to persist a payload using an existing Windows Service DLL.

The ServiceProxy component installs a stub Service Proxy DLL to impersonate/shim an existing auto start Net Services (netsvcs) Service Host using manual registry modifications. The stub is configured to run the input payload whenever the service starts and start the proxied service as it normally would start. The stub is stored at a user specified location on the target file system.

You may choose a service to proxy using the `-n/--name` parameter from a choice of Schedule, LanmanServer, NlaSvc, iphlpsvc, CryptSvc, AudioSvc, or LanmanWorkstation. If no selection is made for the `-n/--name` parameter, it will automatically select an appropriate service to proxy.

You may also specify a `-d/--disallowed` parameter to prevent it from using a particular service. You may specify any of the above services to not use. You may specify multiple disallowed services to prevent it from using more than one service.

For Stub A the payload is stored as a resource of the ServiceProxy stub. If the payload adheres to the NOD Persistence Spec v1 Interface, the stub will load and execute the payload from memory. If not, the stub will write the payload to the filesystem and load or run it normally. If a payload path parameter is specified the payload will be written to that path, otherwise the payload will be placed adjacent to the stub with a `<stubname>cpl.dll` file extension.

For Stub B the payload is written to the filesystem at installation time. There is no NOD Persistence Spec v1 Interface. If a payload path parameter is specified the payload will be written to that path, otherwise the payload will be placed adjacent to the stub with a `<stubname>mgr.dll` file extension.

For Stub C the payload is written to the filesystem at installation time. There is no NOD Persistence Spec v1 Interface. If a payload path parameter is specified the payload will be written to that path, otherwise the payload will be placed adjacent to the stub with a `<stubname>mfg.dll` file extension.

Due to caching by the Service Control Manager, the service cannot be started directly when first installed. The ServiceProxy component can, optionally, hijack an existing, stopped service DLL's entry in the SCM database to gain immediate execution using the `--hijack` flag. Upon reboot it will use its proxied service.

2 Usage

2.1 Builder Command Line

```
add component serviceproxy -p PATH [-n NAME] [-u PATH]
```

<code>-p/--path PATH</code>	target path of the serviceproxy dll stub
<code>-n/--name NAME</code>	name of the service dll to proxy
<code>--hijack</code>	hijack a stopped service for immediate execution
<code>-k/--killfile PATH</code>	target path of the killfile
<code>-d/--disallowed NAME</code>	exclude this service from proxy consideration
<code>--payloadpath PATH</code>	target path of the payload

```
--stubname STUBNAME alternate stubname to use {A|B|C} [default A]
```

Example

```
(gh) add component serviceproxy
-p "c:\windows\system32\example.dll"
-n LanmanServer
--hijack
-k "%temp%\killme.txt"
--payloadpath "%SYSROOT%\payload.dll"
```

Note: The --hijack option temporarily utilizes a stopped service to immediately start the ServiceProxy Stub. This hijack feature only works once and will not work again until system is rebooted.

2.2 Supported Payload Types

ServiceProxy accepts input payloads in EXE or DLL formats for the x86 or x64 architectures. If a payload DLL supports the NOD Persistence Specification, the stub will memory load it during execution if using Stub A otherwise it is written to disk and loaded. ServiceProxy is a terminating component and does not output a payload.

Input Type	Output Type(s)
x86 DLL nod-persist	None
x64 DLL nod-persist	None
x86 DLL	None
x64 DLL	None
x86 EXE	None
x64 EXE	None

2.3 Supported Variant Stubnames

As part of the ServiceProxy component version 1.1, variant stubs were added. Three stubs are available the default stub A, and stub B, and stub C.

1. The default stub A uses the CRT and uses resources data to store configuration information as well as the obfuscated payload(using xor with random key). Stub A uses a payload file name specified in command line option or if none specified will use stubname dll filename except with a stubname{cpl}.extension. Stub A also supports NOD-persist dlls and performs memory loading of the payload when NOD persist dlls are specified.
2. Stub B stub uses alternate resource ids, and writes the payload to disk during installation time. Stub B uses a payload file name specified in command line option or if none specified will use stubname dll filename except with a stubname{mgr}.extension.

3. Stub C stub uses alternate resource ids, and writes the payload to disk during installation time. Stub C uses a payload file name specified in command line option or if none specified will use stubname.dll filename except with a stubname{cfg}.extension.

2.4 Uninstall Procedure

Manual

The manual uninstall procedure consists of the following steps:

1. Edit
HKLM\SYSTEM\CurrentControlSet\Services\\Parameters registry and replace with original dll for this service
2. Reboot the target.
3. Delete the stub and payload executables from the filesystem.
`del /F <SERVICE_PATH> <PAYLOAD_PATH>`

Autonomous

Option 1: The autonomous uninstall procedure consists of the following steps:

1. Delete the payload from the filesystem while the stub is running.

When the stub detects that the payload has been deleted, it will execute the autonomous uninstall. The stub checks for the payload every 10 seconds. The autonomous uninstall will perform the following steps:

1. Remove the service proxy from the Windows registry and return entry to original state.
2. Delete itself from the filesystem.

Option 2: Killfile was configured.

1. Create killfile path on file system.

When the stub detects that the killfile exists, it will execute the autonomous uninstall. The stub checks for the killfile every 40 seconds. The autonomous uninstall will perform the following steps:

3. Remove the service proxy from the Windows registry and return entry to original state.
4. Delete itself from the filesystem.

3 Footprint

File System

- Service Stub Executable, located at a user specified location <STUB_PATH>
- Service Stub Directory, may have been created
- Payload Executable, located at <STUB_PATH>{cp1|mgr|cfg}.{exe|dll} or specified path
- Payload Directory, may have been created

Registry Keys

Modified

- HKLM\SYSTEM\CurrentControlSet\Services\<PROXIED_SERVICE_NAME>\Parameters

Modified (during hijack)

- HKLM\SYSTEM\CurrentControlSet\Services\<HIJACKED_SERVICE>\Parameters\ServiceDll
- HKLM\SYSTEM\CurrentControlSet\Services\<HIJACKED_SERVICE>\Parameters\ServiceDll
UnloadOnStop

Testing Observation

During automated testing on some Kaspersky boxes, and when the service path was configured to a file in window/temp, and the LanmanServer service was the service proxied a popup would occur identifying the grasshopper as a Trojan. This did not occur for other service paths or services. If the temp path was needed for the service the -d/--disallowed parameter could be used to prevent LanmanServer usage.