

Dear NonStop user,

during the operating system evaluation by the NCSC in 1989, one of the requirements was to 'brand' executables in a way that allows the end user to verify the integrity. As a result, the software fingerprint was created. Each piece of code that you'll get from HP, is branded with its fingerprint.

The verification of the fingerprint can be done using the SWID (Software Identification) tool, which is part of the system software delivery: It calculates the current fingerprint, and compares it with the one found in the object file.

A typical integrity check of a HP delivered piece of code with SWID looks like this:

```
$GHS1 SHOWLIB 14> swid $system.sys02.tacl
SoftWare Identification Utility - T9298AAV - (20JAN2012) System \GINKGO
(C)1991 Tandem (C)2011 Hewlett Packard Development Company, L.P.
04Sep15 09:57:35 (Switches: None)

$SYSTEM.SYS02

      Code  Original fpts                Current fpts  Mismatch
TACL      100  7c56-b2f8-1cf6-fbea    7c56-b2f8-1cf6-fbea    No
$GHS1 SHOWLIB 15>
```

The Original fpts is the branded value, while the Current fpts is the currently by SWID computed value. In case they are identical, the check result is: No mismatch.

In case the check fails, the following is displayed:

```
$GHS1 INTACT 23> swid secom700.scfnorun
SoftWare Identification Utility - T9298AAV - (20JAN2012) System \GINKGO
(C)1991 Tandem (C)2011 Hewlett Packard Development Company, L.P.
04Sep15 10:24:10 (Switches: None)

$GHS1.SECOM700

      Code  Original fpts                Current fpts  Mismatch
SCFNORUN  100  4fa7-4d31-b746-21e9    4fc5-c609-d366-c416    Yes
$GHS1 INTACT 24>
```

The branding program is named SWFIT (Software Fingerprint Insertion Tool) and is a HP internal tool, not available to customers. But wouldn't it be nice to brand your own products in a 'SWID compatible way'?

We got this request from one of our customers: They want to brand their code before it is delivered from development to the production system, allowing the system administrators of the production system to check with SWID, if the delivered code is the one that was originally compiled and shipped.

Solution

GreenHouse developed a solution: GSWFIT (GreenHouse Software Fingerprint Insertion Tool)

- It is the GreenHouse version of the SWFIT tool and compatible to SWFIT.
- It calculates the finger print, using the same mechanism as SWFIT, and writes it into the object file into the fingerprint field.
- The integrity check can be done using SWID, and the result looks like the examples above.

GSWFIT does NOT change the:

- Files EOF
- Last modification time stamp
- Possibly already available fingerprint

Requirements

1. The GSWFIT user must have execution access rights on \$SYSTEM.SYSTEM.SWID.
Best is to secure the SWID program to "OONO" (or an equivalent ACL) and to give it to SUPER.SUPER.
2. The file to brand has to be closed, and the GSWFIT user must have read/write exclusive access on it.
3. The file to brand has to be an executable with a file code of:
 - 100
 - 500
 - 700
 - 800
4. GSWFIT has to be licensed.

Command syntax

```
GSWFIT <file-template>
```

where

```
<file-template> defines the file(s) to be branded, e.g. SECOM700.SE* .
```

Restrictions

- No OUT file support (the output is sent to the home terminal)
- No IN file support (e.g. no OBEY file support)
- No INLINE support
- No interactive usage

A typical successful fingerprint insertion looks like this:

```
$GHS1 INTACT 24> gswfit secom700.object
GSWFIT (100) - T7172H06 - (01Sep2015) System \GINKGO, running NSK H06.28
Copyright (c) GreenHouse Software & Consulting 2015

      Code  Original fpts                Current fpts  Inserted
OBJECT   100  *n/a*                4f77-0613-c5e2-426d  Yes
$GHS1 INTACT 25>
```

In case the insertion fails, the responsible file error is displayed:

```
$GHS1 INTACT 25> gswfit secom700.object
GSWFIT (100) - T7172H06 - (01Sep2015) System \GINKGO, running NSK H06.28
Copyright (c) GreenHouse Software & Consulting 2015

      Code  Original fpts                Current fpts  Inserted
OBJECT   100  *n/a*                4f77-0613-c5e2-426d  NO -> 48
$GHS1 INTACT 26>
```

In case there is a fingerprint already available, the original fingerprint is displayed, no insertion is done:

```
$GHS1 INTACT 26> gswfit secom700.object
GSWFIT (100) - T7172H06 - (01Sep2015) System \GINKGO, running NSK H06.28
Copyright (c) GreenHouse Software & Consulting 2015

      Code  Original fpts                Current fpts  Inserted
OBJECT   100  4f77-0613-c5e2-426d  *Not Computed*  No
$GHS1 INTACT 27>
```

Checking the integrity with SWID shows this:

```
$GHS1 INTACT 27> swid secom700.object
SoftWare Identification Utility - T9298AAV - (20JAN2012) System \GINKGO
(C)1991 Tandem (C)2011 Hewlett Packard Development Company, L.P.
04Sep15 10:31:39 (Switches: None)

$GHS1.SECOM700

      Code  Original fpts                Current fpts  Mismatch
OBJECT   100  4f77-0613-c5e2-426d  4f77-0613-c5e2-426d  No
$GHS1 INTACT 28>
```

In case you are like the tool, please feel free to download it from:

www.GreenHouse.de/ZIPDownload/GSWFIT.zip

Please let me know your comments, and success stories.

Carl Weber
GreenHouse Software & Consulting
04Sep2015

```
$GHS1 SHOWLIB 15> swid $system.sys02.osimage
SoftWare Identification Utility - T9298AAV - (20JAN2012) System \GINKGO
(C)1991 Tandem (C)2011 Hewlett Packard Development Company, L.P.
04Sep15 09:59:50 (Switches: None)

$SYSTEM.SYS02

      Code  Original fpts                Current fpts  Mismatch
OSIMAGE    0  *n/a*                f8c1-94a3-3d13-557c
$GHS1 SHOWLIB 16>
```

During a discussion about system and data integrity with a big GreenHouse customer the request popped up to allow Nonstop customers to brand their products as well in a way, to make it SWID compatible.