LMU | LA
Frank R. Seaver College of Science and Engineering

SAFEXEC

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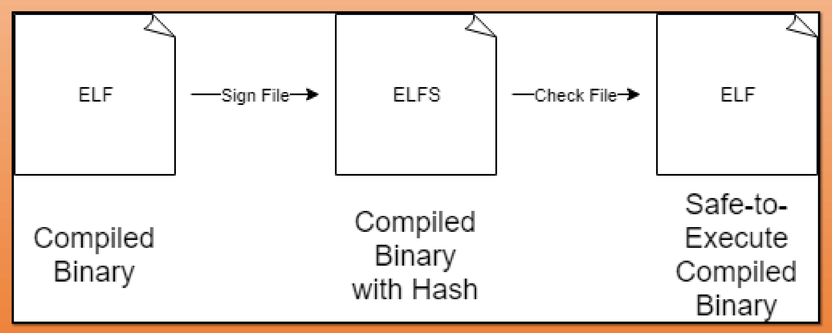
CMSI 402

What is Code Signing?

Code signing is the process of digitally signing a binary executable file. Similar to signing a letter, it is a method of ensuring that the code has not been tampered with since it was signed. Safexec is a code signing application for executable files (ELF format) on Linux. Code signing is useful for anyone who wants to send executable binaries over an insecure internet connection.



Resources Utilized

All of the source code for Safexec was written in Python. The *Hashlib* library was used to access the SHA 512 hashing algorithm. The Secure Hashing Algorithm version 3, 512 bit hash version is used to hash the ELF files. HxD was used to manipulate executables in hexadecimal format for testing purposes. GitHub was used for version control. Ubuntu was used for generating ELF files for modification and testing.

How Does Safexec Work?

1. The programmer uses Safexec to sign an ELF file into an ELFS file.
2. The ELFS file is sent to the user over the internet.
3. The user receives the ELFS file and runs Safexec on it.
4. Safexec informs the user whether or not the ELFS file is safe to execute.
5. An ELF file is then produced for the user to run if they choose.

```
E:\track\Documents\School Related\CMSI\CMSI 402\Safexec\Src>dir
 Volume in drive E is Secondary Disk
 Volume Serial Number is 24C5-FE66

 Directory of E:\track\Documents\School Related\CMSI\CMSI 402\Safexec\Src

04/09/2019  17:44    <DIR>          .
04/09/2019  17:44    <DIR>          ..
04/08/2019  21:49             1,133 data_hasher.py
04/09/2019  17:41             1,767 file_handler.py
04/09/2019  17:42             1,399 safexec.py
04/09/2019  16:33             1,547 safexec_exceptions.py
04/09/2019  17:44             9,065 test.ELF
04/09/2019  17:44             9,193 test.ELFS
04/09/2019  17:34             5,641 unit_tests.py
04/09/2019  17:41    <DIR>          __pycache__
               7 File(s)         29,745 bytes
               3 Dir(s)  754,468,679,680 bytes free

E:\track\Documents\School Related\CMSI\CMSI 402\Safexec\Src>python safexec.py test.ELFS
E:\track\Documents\School Related\CMSI\CMSI 402\Safexec\Src\test.ELF
File provided is safe-to-execute.

E:\track\Documents\School Related\CMSI\CMSI 402\Safexec\Src>
```