

Generating Cryptographic Checksums Using Built-In Operating System Tools

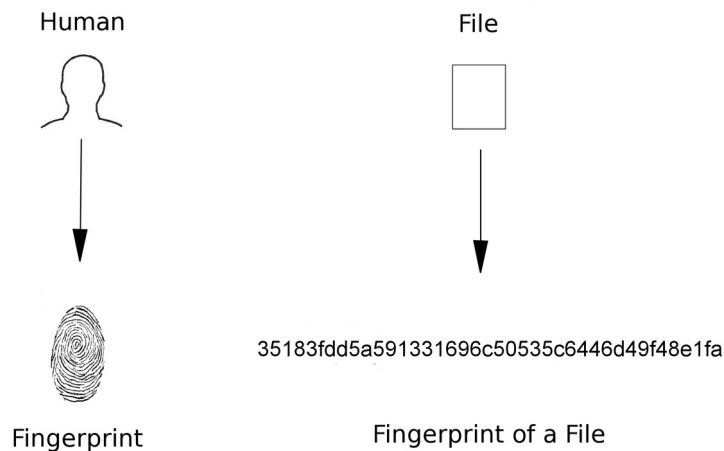
For MS-Windows, MacOS, GNU/Linux and BSD/Unix

People are complex creatures. Fingerprints are often used to identify them quickly and easily. Computer files can be identified using the same principle: by generating an "electronic fingerprint" called a cryptographic checksum, a number that always remains the same. Standardized procedures can be used to quickly verify the integrity and authenticity of any file. Human fingerprints are created with ink pads; electronic fingerprints are created with a checksum program.

Cryptographic checksums are based on hash functions, which return hash values as a result for any file.

A file and identical copies of it always have the same hash value checksum. However, if even a single bit or character changes due to damage or manipulation, a completely different hash value should result.

Changing the file name does not change the cryptographic checksum.



MS-Windows: PowerShell

Try it out: Place any file document on your desktop, such as a picture file or a text document such as *letter.txt*. In the Windows search bar at the bottom left, type PowerShell. Click the first entry that appears, "Windows PowerShell App." The built-in command line window opens. 1. Type "`cd Desktop`", always without quotation marks, and then press En-

ter. 2. type "`ls`" and press Enter, which will list all your folders and files in the *Desktop* directory, including your sample file. 3. calculate the checksum for your file using the `Get-FileHash [filename]` command, in this example `Get-FileHash letter.txt`. The default algorithm used, the cryptographic checksum, and the file path are displayed.

```
PS C:\Users\chef\Desktop> Get-FileHash letter.txt
```

GNU/Linux, BSD/Unix and MacOS

Under Unix-like operating systems, you can also open a command line environment and use one of the almost always pre-installed `shasum` programs, for

example `sha256`, `sha256sum` or `sha512` or `sha512sum` etc. Example: `sha256sum` followed by the filename: `sha256sum letter.txt`.

Related Article and Imprint

For more information, see "Practical Application of Cryptographic Checksums", published in English and German on peterjockisch.de.

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