

How to generate MD5 checksums and use them to check the integrity of transferred data

What is a MD5 checksum?

MD5 checksum is a hash function producing a 128-bit hash value. It is widely used in the software world to provide some assurance that a transferred file has arrived intact.

Linux or Mac:

How to generate an md5 checksum on Linux or Mac

- 1) open a terminal
- 2) navigate to the location where the file (some_file.txt) for which you want to generate an md5 checksum is located
- 3) type the following command: `md5sum some_file.txt > checkmd5.md5`
- 4) to check the content of checkmd5.md5 run: `cat checkmd5.md5`

you will see something like this:

```
ee1ee0ab262121c0f9e79f28a76ec8dc  some_file.txt
```

Check integrity of a file using a provided md5 checksum on Linux or Mac

my_large_file.txt: the file that you downloaded and whose integrity you want to check

checkmd5.md5: a file that contains the md5 checksum of my_large_file.txt. It is usually provided by the party that generated my_large_file.txt (e.g. the sequencing core facility). The file name can differ, and it can be opened using a text editor, e.g. notepad. In this example, the content of checkmd5.md5 is:

```
c4c4cb1b8bf1cbd4f112f0bf88a7aeb3 my_large_file.txt
```

To check if my_large_file.txt is ok after you downloaded it to your computer:

- 1) open a terminal
- 2) navigate to the location (the folder) where both files (my_large_file.txt and checkmd5.md5) are stored
- 3) type the following command: `md5sum -c checkmd5.md5`

If my_large_file.txt is ok you will get this message:

```
my_large_file.txt: OK
```

If my_large_file.txt is incomplete or corrupted, you will get this message:

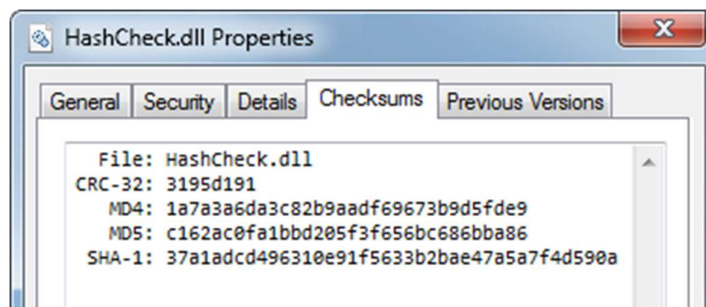
```
my_large_file.txt: FAILED
```

```
md5sum: WARNING: 1 of 1 computed checksums did NOT match
```

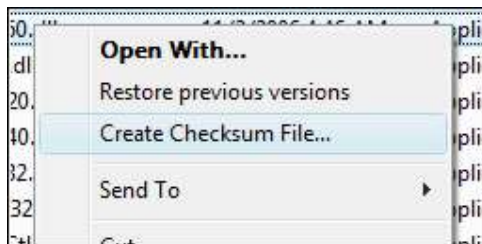
Windows:

How to generate an md5 checksum on Windows

- Command Line:
 - Open command prompt (Press Windows+X to open the Power Users menu, and then click "Command Prompt") and type:
`CertUtil -hashfile <path to file> MD5`
- Or within explorer:
 - Download the program HashCheck (<http://code.kliu.org/hashcheck/>)
 - It integrates file checksumming functionality into Windows file properties dialog: Within Windows Explorer right click on the file and select properties → you will see a tab containing different check sums including MD5



- Or you can create checksum files:
If you want to create a checksum file, HashCheck adds an optional "Create Checksum File" command to the shell's context menu. Simply select the files and directories that you want to hash and create a checksum file for, right-click on them, and select "Create Checksum File".



Check integrity of a file using a provided md5 checksum on Windows

my_large_file.txt: the file that you downloaded and whose integrity you want to check

checkmd5.md5: a file that contains the md5 checksum of my_large_file.txt. It is usually provided by the party that generated my_large_file.txt (e.g. the sequencing core facility). The file name can differ, and it can be opened using a text editor, e.g. notepad. In this example, the content of checkmd5.md5 is:

```
c4c4cb1b8bf1cbd4f112f0bf88a7aeb3 my_large_file.txt
```

To check if `my_large_file.txt` is ok after you transferred it to your computer:

- 1) Generate the MD5 checksum for `my_large_file.txt` as described above
- 2) Compare the obtained MD5 checksum with the one that you were provided with, in this example the content of `checkmd5.md5`. To do this you may use a text editor, e.g. notepad, to open `checkmd5.md5` and then use the search function to see if the hashes are identical