Crysis 3 Mod Enabler

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I. Description

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You have been waiting for over 7 years, and finally it is here!

The original Crysis is beloved by many not only for its graphics, open world, innovative game mechanics, and multiplayer, but also for its modding support. Crysis 2 continued this tradition, allowing players to tweak the game balance, create new maps and weapons, and more.

But for Crysis 3 we got nothing. No mod support, high-resolution texture support—nothing. The only thing we were given was the CryEngine SDK, which despite its many merits offered no use at all for those who wished to modify Crysis 3 itself.

To our credit, modders did make some headway in Crysis 3—using a tool called PakDecrypt, it is possible to extract the game assets (textures, scripts, music, and so on) into human-readable form. However, up until now it has been impossible to put those assets back into Crysis 3. We could extract files, modify them, but never reincorporate them into the game itself.

All of this changes today with the Crysis 3 Mod Enabler. **This tool grants you the freedom to develop and share your own mods** for the final installment in this epic trilogy. All you need is a legal copy of the game, Cheat Engine, and 30 minutes of your time.

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II. What this Tool Does

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The Crysis 3 Mod Enabler allows you to use singleplayer mods in your legal copy of Crysis 3. This goal is achieved by repackaging your game's files to utilize a *public modding key* (bundled with this tool), which allows you to download, use, and create your own mods.

This tool provides you with de-encrypted asset files (generated from your own game folder), which are essential for creating your own mods, and also gives you a means to repackage your modifications to then distribute to others. Finally, you can use this tool to modify or combine different mods created by your friends.

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III. What this Tool Does Not Do

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No copyrighted game materials are distributed with the Crysis 3 Mod Enabler. As such, you must possess your own legal copy of Crysis 3 to use this tool.

This tool *cannot* be used to "crack" or otherwise obtain an illegal copy of Crysis 3.

This tool does *not* circumvent, bypass, or in any way affect the DRM mechanisms associated with Crysis 3. If you are looking to "decouple" Crysis from Origin, this is <u>not</u> the tool for you.

No mods are provided; you will have to download mods from other sources or create your own.

Multiplayer mods are not supported. Although there is nothing preventing you from creating such mods, I take no responsibility for any bans (temporary or permanent) that you may incur from using them.

This tool does not phone home, collect user data, or otherwise intrude upon your privacy.

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IV. Disclaimer

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THIS SOFTWARE IS INTENDED FOR OFFLINE USE ONLY. ONLINE USAGE MAY RESULT IN BANS, TEMPORARY OR PERMANENT.

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V. Installation

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Prerequisites:
- A legally installed copy of Crysis 3
- Windows 7, 8(.1), or 10
- Cheat Engine (any version will do, but I use 6.7)
- Python 3

First, make sure that you meet all of the requirements stipulated above. Then go to the Crysis 3 Mod Enabler folder, open up a Command Prompt, and type in the following command:

```
python enableCrysis3ModSupport.py
```

You should see the following welcome message:

Note: if you don't want to create a backup (not recommended!), you can use the command `python enableCrysis3ModSupport.py --noBackup` *instead. Python 2 users can still use this and other tools by editing the *.py files to use "*`raw_input()`*" instead of "*`input()`*".*

Please read the welcome message carefully before proceeding. When you are ready to patch your game, enter the location of your game folder like so (spaces are allowed) and press Enter:

```
Enter full path to Crysis 3 (e.g. C:\Games\Crysis 3): F:\Crysis 3
```

The tool will start by backing up your game folder. This usually takes between 5-10 minutes:

```
Your chosen game folder 'F:\Crysis 3'
is currently being backed up to the '__gameBackup' folder in this directory.
This backup can take several minutes; please be patient!

Backing up game folder...
```

After the backup is complete, you will receive the following message. Read this message carefully, then type "yes" when ready and press Enter:

```
Success! Your game folder 'F:\Crysis 3'
has been backed up to 'F:\__Mods\Crysis3\crysis3ModEnabler\__gameBackup'.
In the unlikely event that anything goes wrong with this script, just copy the
contents of '__gameBackup' back into your game folder. This will restore your
game to its original (unmodded) state. Make sure to overwrite all files when
prompted.

This script is now ready to unlock Crysis 3. You will see several messages
during this process, which can be safely ignored unless there is an
error. DO NOT START CRYSIS 3 UNTIL THIS SCRIPT TELLS YOU TO DO SO!

Are you ready to unlock Crysis 3? This process can take 30-60 minutes.
Unlock Crysis 3? (yes/no): yes
```

A ton of messages will start to appear on the screen—don't worry, this is normal! These messages will continue to appear for approximately 30-60 minutes until the tool is finished. The exact time will depend on your computer's speed and hardware.

You will see the following message if everything finished successfully:

```
=================================================================
'F:\Crysis 3' has been unlocked!

You should now be able to install and run mods. Please note that Crysis 3 will
NOT open normally unless you open 'crysis3ModEnabler.CT' in Cheat Engine first.
Please see the 'readme.pdf' file for more information.

If you ever need to revert to a 'locked' Crysis 3 (e.g. to play multiplayer),
just copy the contents of '__gameBackup' back into your Crysis 3 game folder.
Make sure to overwrite all files when prompted.

To create or use mods, please see the 'readme.pdf' file. Resources for modders
have been copied into the '__modResources' folder in this directory.

UNLOCKED CRYSIS HAS ONLY BEEN TESTED OFFLINE IN SINGLEPLAYER. MAKE SURE YOU ARE
OFFLINE BEFORE ATTEMPTING TO RUN AN UNLOCKED CRYSIS 3. IF YOU RUN CRYSIS 3 WHILE

ONLINE OR DURING MULTIPLAYER, YOU MAY RECEIVE A TEMPORARY OR PERMANENT BAN. THE
SCRIPT AUTHOR IS NOT LIABLE FOR ANY DAMAGES INCURRED FROM USING UNLOCKED CRYSIS.

Have fun!
This script will now exit.

F:\__Mods\Crysis3\crysis3ModEnabler>
```

If something went wrong, go to Section 8 below to restore Crysis 3 to its original state. Otherwise, proceed to Section 6.

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VI. Running the Game

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If you try to run Crysis 3 after using the Crysis 3 Mod Enabler, the game will silently crash (you may never even see the window appear). This occurs because Crysis 3 is still expecting to find the original (Crytek/EA) asset files, but they were converted/replaced by this tool.

To run Crysis 3, make sure you have installed Cheat Engine and then double-click on `crysis3ModEnabler.CT` (in some Windows systems, the "CT" extension may be hidden):
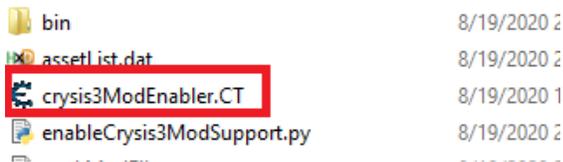
When the cheat table loads, you should see the following message about running a Lua script. Choose `Yes` when prompted:
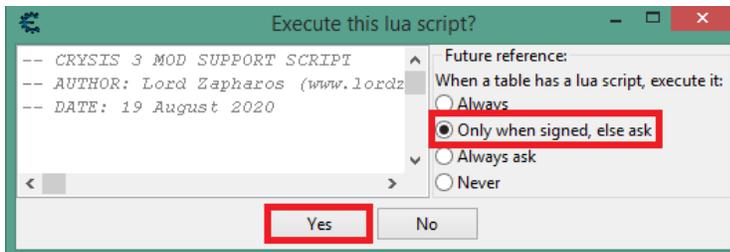
Wait until the Cheat Engine window shows up (bottom image, left), but don't do anything in the window itself. Instead, open Crysis 3 as you normally would in Origin (bottom image, right; I am using a shortcut):
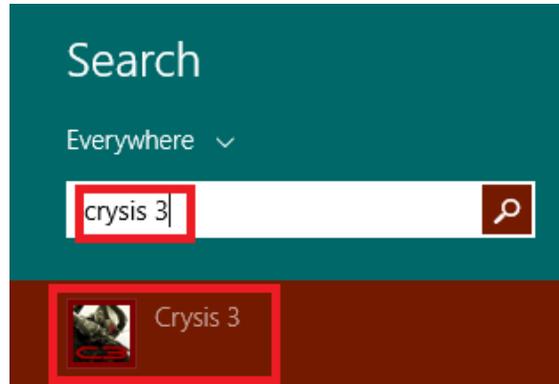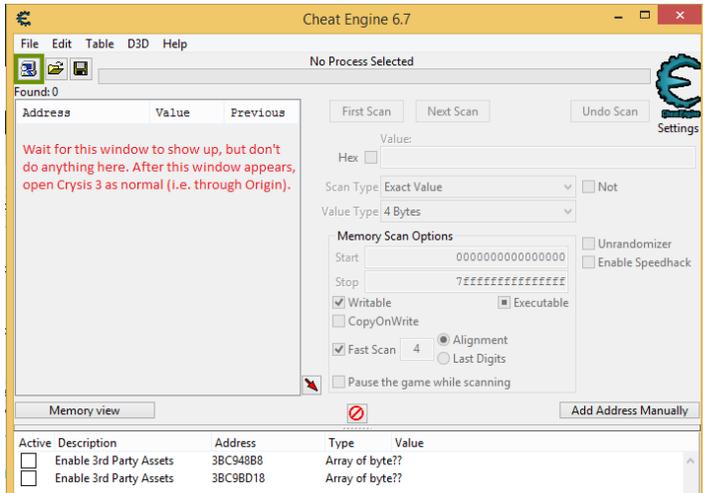
At this point, the game should open normally after a second or two. If the game doesn't start, click on `Table → Show Cheat Table Lua Script` and then click on `Execute Script` to run it manually; then try opening Crysis 3 again. If it still isn't working, proceed to the next section.

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If Crysis 3 started up normally for you after following the instructions on the previous page, congratulations! Mods should now be allowed in your game—so go download one! You can now close this document.

If Crysis 3 didn't start up normally, try following the previous page's instructions 2-3 times (sometimes Cheat Engine doesn't "hook in" to the game right away. Otherwise, proceed to the following page to troubleshoot the problem.

To get started creating your own mods, please see the modder's guide in Section 9.

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VII. Troubleshooting: The Game Still Won't Start!

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Please skip this section if you were able to run Crysis 3 normally in the previous section.

In some scenarios, the memory addresses in the provided Cheat Engine table may be incorrect (they represent the current version of the game, tested on 21 August 2020). This is more likely to occur for those who play offline or who don't update their game. If your version of Crysis 3 won't start using the provided cheat table, you can easily find the correct address yourself.

The easiest, but longer way to do this is to follow Section 8 to revert Crysis 3 back to its original state. This is easy to do, but takes 30-60 minutes as you need to re-encrypt all of the Crysis 3 files a second time. **If you choose this option, open Crysis 3 normally (it shouldn't crash) and skip to page 9.**

A much faster, but slightly more complex option is to find the new memory addresses in Cheat Engine at the exact moment before Crysis 3 crashes. To do this, open the provided cheat table and *do not* run the Lua script. Instead, click on `Table` → `Show Cheat Table Lua Script` and "comment out" the script such that it looks like this:
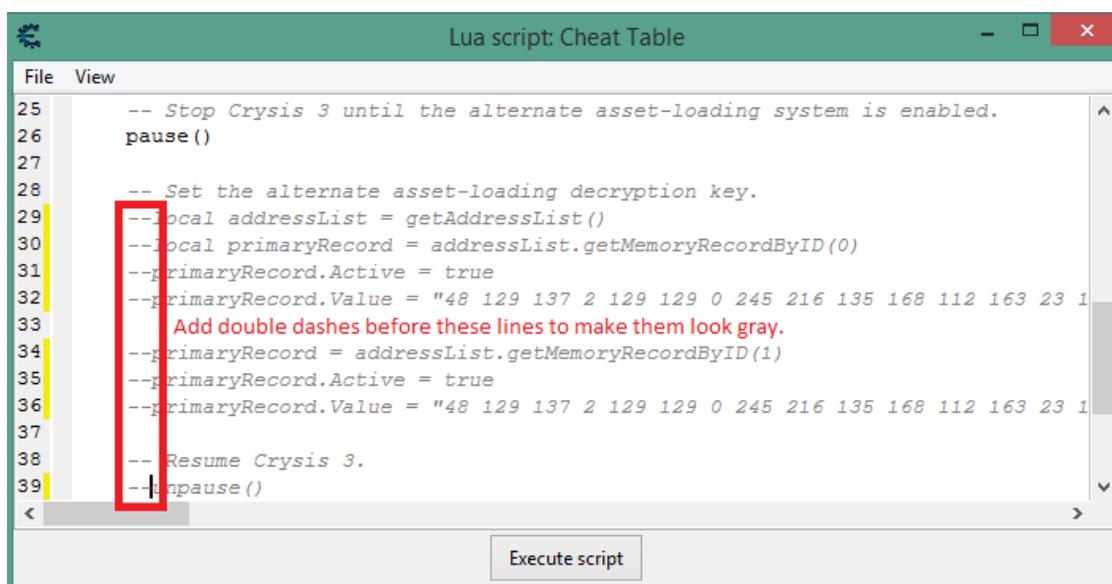
Then click on `Execute script` and start up Crysis 3 normally. You should see something like `crysis3.exe (paused)`, which will flash red/green, in the main Cheat Engine window:
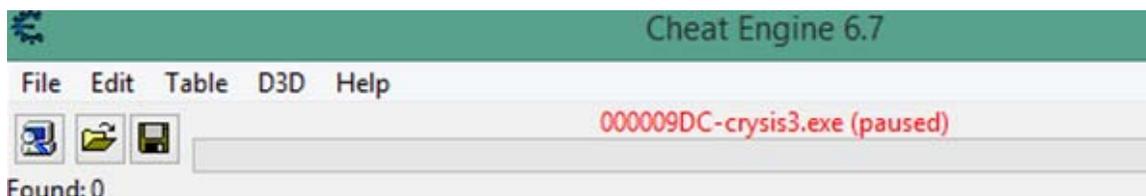
If the text is black or does not say (paused), close Cheat Engine and try again (this usually only happens with slow hard drives). **Do <u>not</u> save the cheat table if prompted!**

Otherwise, click on Advanced Options in the main Cheat Engine window. Click on the pause button to resume Crysis 3 and *very quickly* click on the button again (no more than 1-2 seconds later). This will give time for the correct memory addresses to populate in the game's RAM:
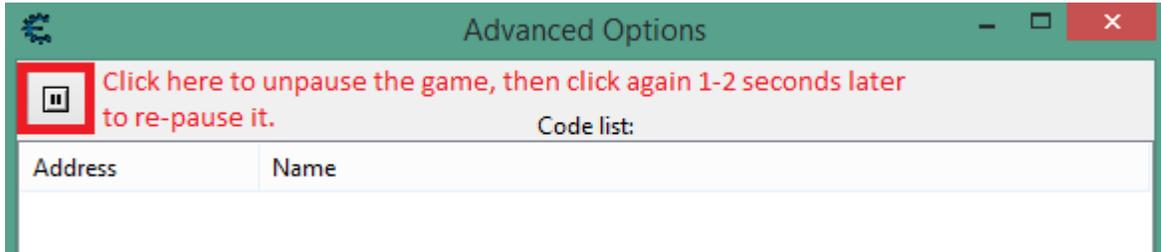
Double-check the text in the main Cheat Engine window—if the text is black or no longer says (paused), you didn't re-pause the game quickly enough and will need to try again.

If you use this method, do <u>not</u> save the cheat table when you close Cheat Engine! Doing so will prevent the cheat table from working normally after you find the correct address.

Please proceed to the next page.

Once Crysis is open or paused, you will need to search for the correct addresses. To do this, change `Value Type` in the main Cheat Engine window to `Array of byte`, make sure `Hex` is selected, and paste in the following value (yes, it is very long!):

```
30819F300D06092A864886F70D010101050003818D0030818902818100A9D590A4BC92DB8CF1F
C5AD58F46055216EEF3C3BE86DE701F4E2D18D3019246BEFAAD66047B8CDD0D248DA723CA52C8
E501E0B72BEB55CF0DF79777DC11E87B18CCDB90072D9DC4AD807C50238546F3E92C5481117B6
DE257878E65E1D316C454ED29ED51FDB1EFE4950124AEC06AFAE05B19D2E6F0223BC3E7DD171A
8CF8E10203010001
```

Then click on "First Scan":
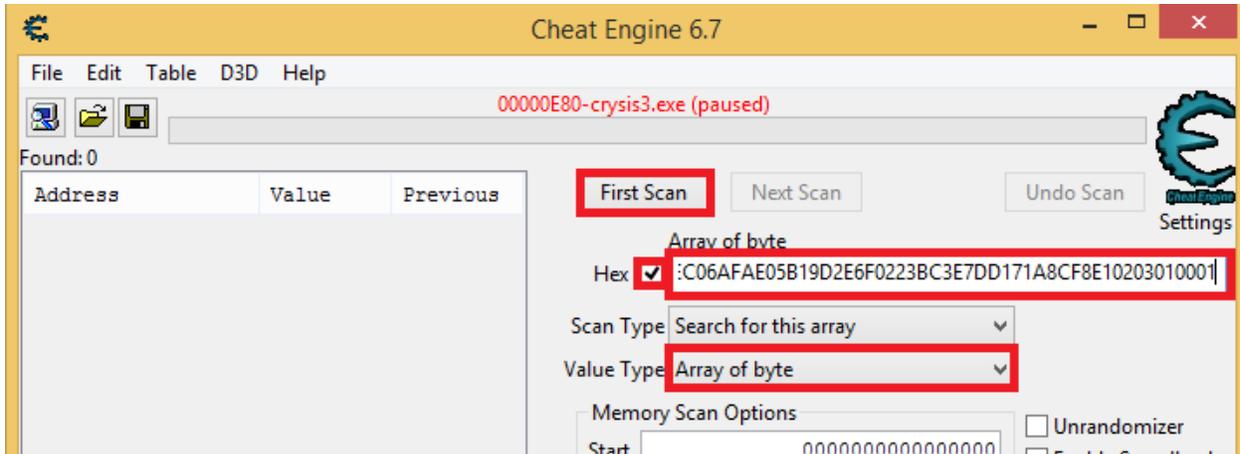
After clicking on `First Scan`, you should see two addresses and values pop up in the window on the left. **If nothing shows up at all, you might have paused the game too soon;** unpause and close Crysis 3, then go back to the previous page and try again.

Otherwise, you should see something like the following:
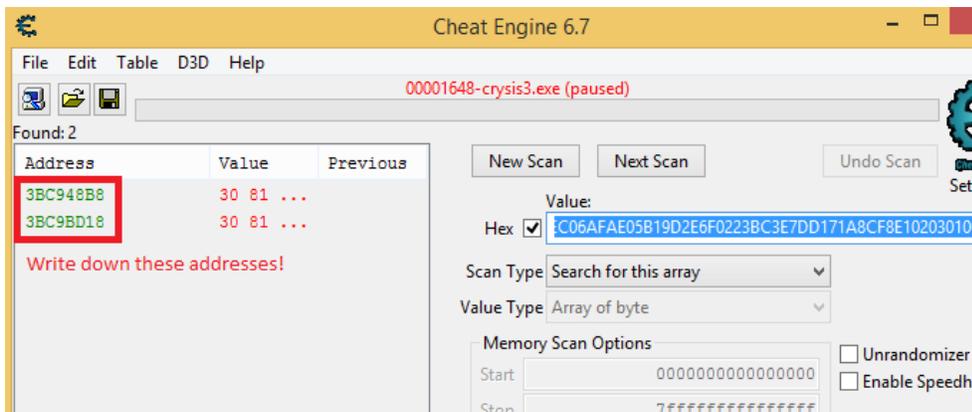
Note: for older versions of the game, it is possible that you might only see one memory address instead of two. If this is the case, continue following this guide, but you will have to edit the cheat table `crysis3ModEnabler.CT` *(including the built-in Lua script) to only use that one address.*

The two addresses highlighted in the screenshot above are what you need. Right-click on `crysis3ModEnabler.CT` and open it with Notepad or any other text editor (I recommend Notepad++). Put your new addresses into the four sections highlighted on the next page:

```xml
<?xml version="1.0" encoding="utf-8"?>
<CheatTable CheatEngineTableVersion="26">
  <CheatEntries>
    <CheatEntry>
      <ID>0</ID>
      <Description>"Enable 3rd Party Assets"</Description>
      <LastState Value="48 129 137 2 129 129 0 245 216 135 168 112 163 23 159 99 15 82 55 13 53 97 184 5
        39 223 93 166 177 132 148 29 196 68 67 28 211 109 40 108 36 85 133 92 73 13 142 197 98 32 247 239
        238 23 164 199 132 195 117 242 70 222 227 57 217 180 26 114 215 108 242 63 19 215 46 170 171 160 130
        16 158 17 250 120 0 20 107 156 169 151 88 68 77 31 1 26 37 206 71 25 149 218 64 9 105 109 223 74 164
        111 113 27 136 251 247 123 46 80 26 161 103 242 134 229 194 115 197 118 190 1 216 81 21 141 35 2 3 1
        0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0" Activated="0" RealAddress=3BC948B8 />
      <VariableType>Array of byte</VariableType>
      <ByteLength>162</ByteLength>
      <Address>3BC948B8</Address>
    </CheatEntry>
    <CheatEntry>
      <ID>1</ID>
      <Description>"Enable 3rd Party Assets"</Description>
      <LastState Value="48 129 137 2 129 129 0 245 216 135 168 112 163 23 159 99 15 82 55 13 53 97 184 5
        39 223 93 166 177 132 148 29 196 68 67 28 211 109 40 108 36 85 133 92 73 13 142 197 98 32 247 239
        238 23 164 199 132 195 117 242 70 222 227 57 217 180 26 114 215 108 242 63 19 215 46 170 171 160 130
        16 158 17 250 120 0 20 107 156 169 151 88 68 77 31 1 26 37 206 71 25 149 218 64 9 105 109 223 74 164
        111 113 27 136 251 247 123 46 80 26 161 103 242 134 229 194 115 197 118 190 1 216 81 21 141 35 2 3 1
        0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0" Activated="0" RealAddress=3BC9BD18 />
      <VariableType>Array of byte</VariableType>
      <ByteLength>162</ByteLength>
      <Address>3BC9BD18</Address>
    </CheatEntry>
  </CheatEntries>
  <UserdefinedSymbols/>
```

Note: in the screenshot above, the blue text is actually wrapped over multiple lines. You may have to scroll horizontally to see the Real Address *sections. The top two highlighted areas represent memory address #1, while the bottom two highlighted areas represent address #2.*

Note: if you only found one memory address in the previous step, you will need to remove the second cheat entry (the region from <Cheat Entry><ID>1</ID> *to* </CheatEntry>*). You will also need to scroll down and remove the corresponding* getMemoryRecordByID(1) *section in the built-in Lua script.*

After doing this, save and close the document, then close Cheat Engine. Follow the instructions in Section 6 again, and Crysis 3 should now open without crashing!

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VIII. Troubleshooting: Reverting to "Vanilla" Crysis 3

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If something went wrong during installation, or if you want to return to your original Crysis 3 installation for any reason, you can easily restore Crysis 3 to its original state.

Start by going to the __gameBackup folder in the Crysis 3 Mod Enabler folder. Select all of the folders within and copy them like so:
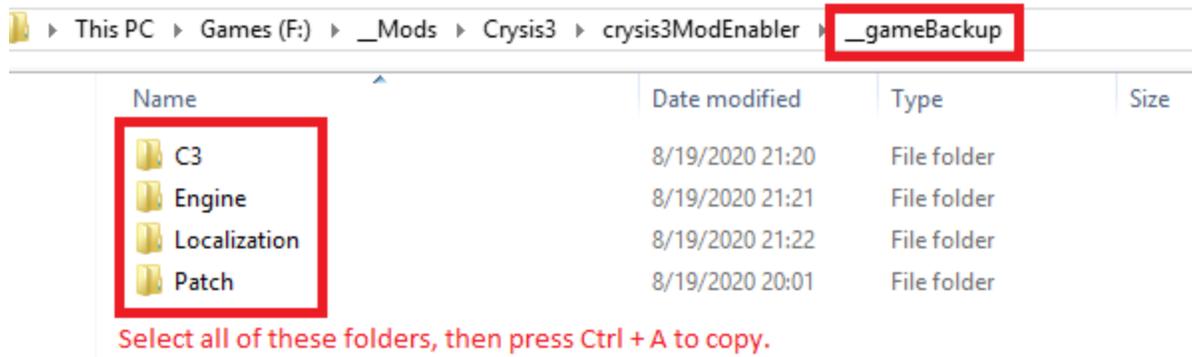
Go to your Crysis 3 game folder, and paste the files by pressing Ctrl + V. You will be prompted to overwrite 274 files; choose yes/replace when asked:
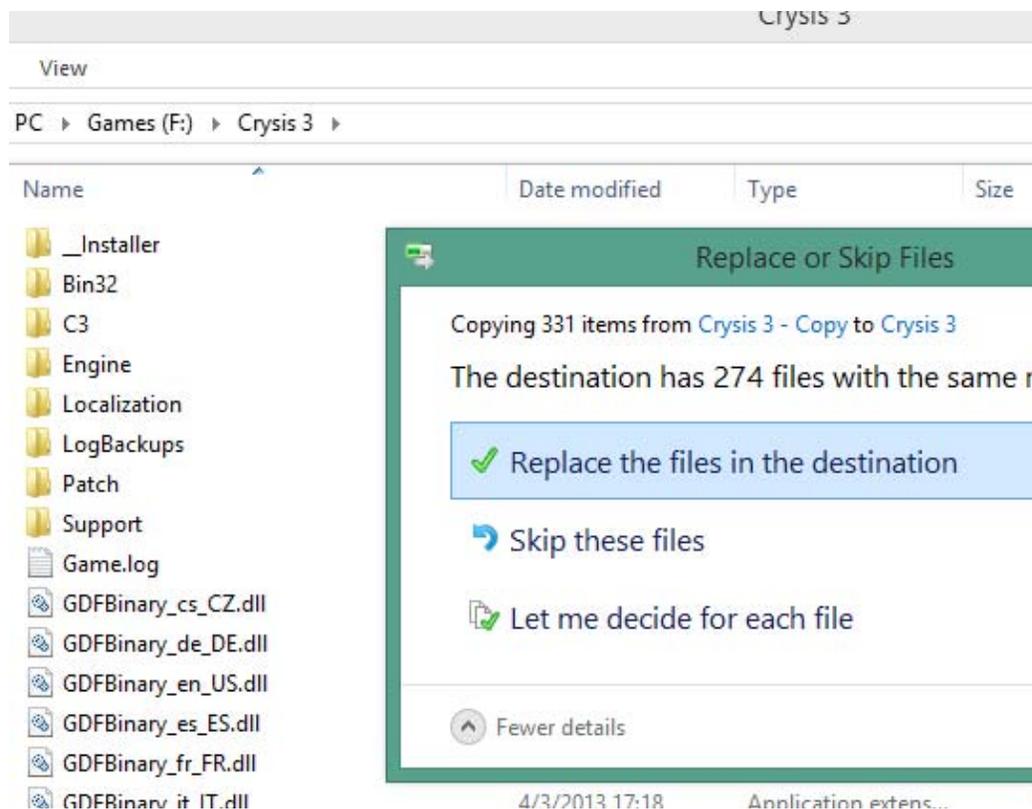
After all of the files have been copied, Crysis 3 will be in its vanilla/original state again.

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IX. Modder's Guide

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Warning: this tool does <u>not</u> distribute copyrighted game material of any kind, and as such the __modResources folder is generated <u>solely</u> from your own legal copy of Crysis 3. Distribution of any files within the __modResources folder is a violation of copyright law. Make sure that you never distribute anything other than your own work!

This tool offers modding support via the following files and folders:

The __modResources folder contains the game's primary assets (maps, textures, sounds, etc.). You can use the files within this folder to start creating your own mod. All assets in this folder are bundled in *.pak files, which can be opened just like regular *.zip or *.rar files. **Because many of these files are almost identical to those in Crysis 2, consider using that game as a modding baseline.** Many of the Crysis 2 and CryEngine SDK tools should work in Crysis 3 (e.g. for creating new maps), although I haven't tested them myself.

The basic workflow for creating a new mod is this:

1. **Find the files you want to modify** in the __modResources folder, then extract them to a separate scratch folder (e.g. myModFolder). For example, the Nanosuit statistics can be found in Scripts.pak, in C3\Scripts\Entities\NanoSuit\nanosuit.xml.

2. **Make whatever modifications you want.** For example, if you open nanosuit.xml with a text editor, you could change the maximum energy from 100 to 200.

3. **To test your mod (prior to release),** copy patch1.pak from __modResources\Patch into the __modInput folder. Then perform the following:

   a. Use 7Z, WinRAR, etc. to copy the contents of myModFolder into patch1.pak. You don't want to copy myModFolder itself; just the C3 folder within!

b. Open a Command Prompt and navigate to the Crysis 3 Mod Enabler, then type the following command, followed by Enter: `python packModFiles.py`. Choose `yes` when prompted for confirmation.

c. An output file will be generated in `__modOutput`. Copy `patch1.pak` from `__modOutput` to your Crysis Patch folder e.g. `C:\Games\Crysis 3\Patch`.

d. Run Crysis 3 and test your mod. **Repeat steps 1-3 until your mod is complete**.

4. **To package your mod (for release),** add `myModFolder` to a zip archive, etc. You can then distribute this mod to others.

===
**NEVER distribute patch1.pak directly! Doing so would be a violation of copyright law!
You must never distribute anything but your own work (i.e. the contents of `myModFolder`).**
===

Other people can install your mod by following these instructions, which I strongly recommend embedding into your readme file:

```
INSTALLATION:
=============================================================================================
1. Download and install the Crysis 3 Mod Enabler.
2. Copy __modResources\Patch\patch1.pak to the __modInput folder.
3. Open __modInput\patch1.pak with 7Z, WinRAR, etc.
4. Copy the "C3" folder from this mod into patch1.pak, then close 7Z/WinRAR.
5. Open up a Command Prompt and navigate to the Crysis 3 Mod Enabler's folder.
6. Type the following command: python packModFiles.py.
7. Press Enter and wait until you see a success message.
8. Close the Command Prompt.
9. Copy __modOutput\patch1.pak to your Crysis 3 Patch folder (e.g. C:\Games\Crysis 3\Patch).
   Make sure to copy this file from __modOutput and NOT __modInput! The latter will NOT work!

Now, run Crysis 3 according to the Crysis 3 Mod Enabler readme guide, and have fun! Please note
that for some mods, you may need to start a new game or restart the current level before the mod
will take effect.

DO NOT USE MODS IN MULTIPLAYER OR WHILE ONLINE! DOING SO CAN RESULT IN TEMPORARY OR PERMANENT BANS.
```

In rare instances (e.g. if you lost the original mod files), you may want to unpack `patch1.pak` after generating it in step 3c above. This can be performed by dragging the `*.pak` file onto `unpackModFile.exe`. A identically-named `*.pak.zip` file will be created, which you can then open with any archiving utility (7Z, WinRAR, etc.).

Video files work differently in Crysis 3; due to their large size and the performance needed for streaming, they are not encrypted at all. However, any modified videos must be *signed* to show up in your game. To sign a modified video file:
1. Copy your modified videos to `__videosInput`.
2. Open a Command Prompt, navigate to the Crysis 3 Mod Enabler folder, and then type the following command followed by Enter: `python signVideoFiles.py`.
3. The output will be generated in `__videosOutput`. Copy these file(s) to your Crysis C3 folder e.g. `C:\Games\Crysis 3\C3`.

Video files do <u>not</u> need to be unpacked via `unpackModFile.exe`.

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X. Credits

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This project was made easier using Notepad++, HxD, Cheat Engine, and IDA Pro 7.

Information regarding the encryption process of CryEngine's PAK storage system was essential to this project and can be found here: http://atom0s.com/forums/viewtopic.php?f=11&t=223.

The decryption key used for vanilla Crysis 3 PAK files can be obtained from this address: https://www.unknowncheats.me/forum/crysis-3-a/86239-crysis-3-pak-extract.html. Keep in mind that the sys_PakPriority and hash check options do *absolutely nothing* in Crysis 3.

The application for extracting vanilla Crysis 3 PAK files (bundled in this tool) is currently available at: https://gamebanana.com/tools/5416. I created a modification of this application to utilize the public modding key provided by this tool.

The publicly available source code for CryEngine (https://github.com/CRYTEK/CRYENGINE) enabled me to better understand how Crysis 3 works and thereby made it easier to analyze the application in IDA Pro. I also used this source code to manually compile the PakEncrypt and KeyGen tools, which allowed me to better understand the asset encryption process.

Many thanks to https://web.archive.org, which allowed me to find older versions of CryEngine, browse ancient/lost forum posts, and so on. This project could not have succeeded otherwise!