Abstract

Creating a Mozilla Firefox installer for an open-source project involves several key steps to ensure a smooth and efficient process. The primary goal is to compile the Firefox source code and package it into an installer, which users can easily distribute and install.

First, you need to set up your development environment. This includes installing necessary tools such as Mercurial for version control, Python for scripting, and MozillaBuild for Windows or equivalent tools for Linux. Once the environment is ready, you clone the Firefox source code from the Mozilla Central repository.

Next, you configure the build system by creating a `mozconfig` file, which specifies the build options and paths. This step is crucial for customizing the build process to meet the specific needs of your project. After configuring, you run the build process using the `mach` command, which compiles the source code into executable binaries.

Finally, you package the compiled binaries into an installer. For Windows, this might involve using tools like NSIS (Null soft Scriptable Install System) to create a user-friendly installer. For Linux, you might create a DEB or RPM package depending on the target distribution.

Throughout the process, it is important to test the installer thoroughly to ensure it works correctly on all intended platforms. This includes verifying that the installation process is smooth, the browser runs without issues, and that you have handled all dependencies.

By following these steps, you can create a reliable and efficient Mozilla Firefox installer tailored to your open-source project's needs.

Now that you have enough background, we dive into steps to integrate Mozilla Central Source Files in order to make our customized installer file for "Persianfox" which I guess should be proper name for this project.

1st Step: Setting up Our Development Environment

In the first place, you need to install these required dependencies:

1.1. Download the latest release of Visual Studio's community edition, as shown in the figure1.1, including C++ Workload and "C++/CLI latest version support" enabled (see figures1.1.2 to 1.1.5)

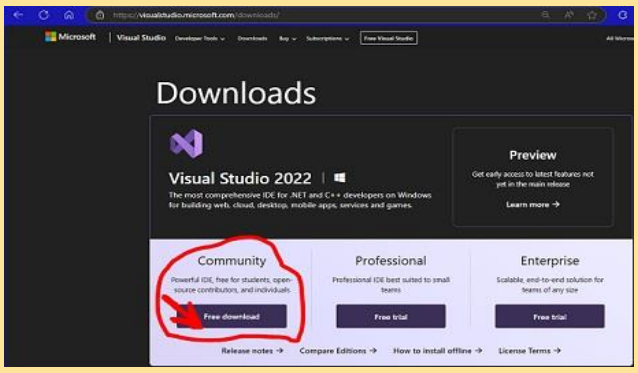


Figure 1.1

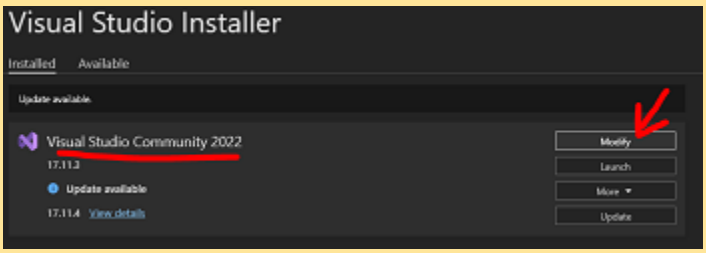


Figure 1.1.2

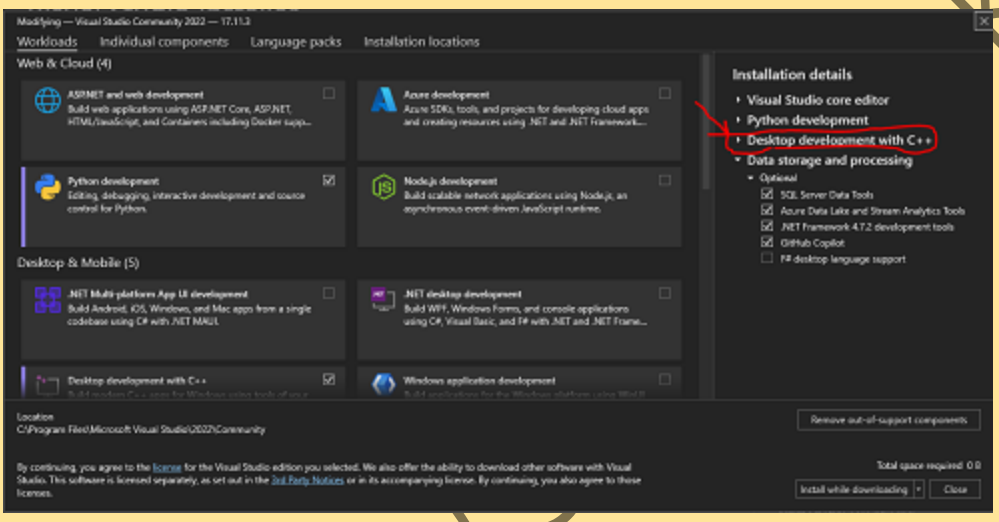


Figure 1.1.3

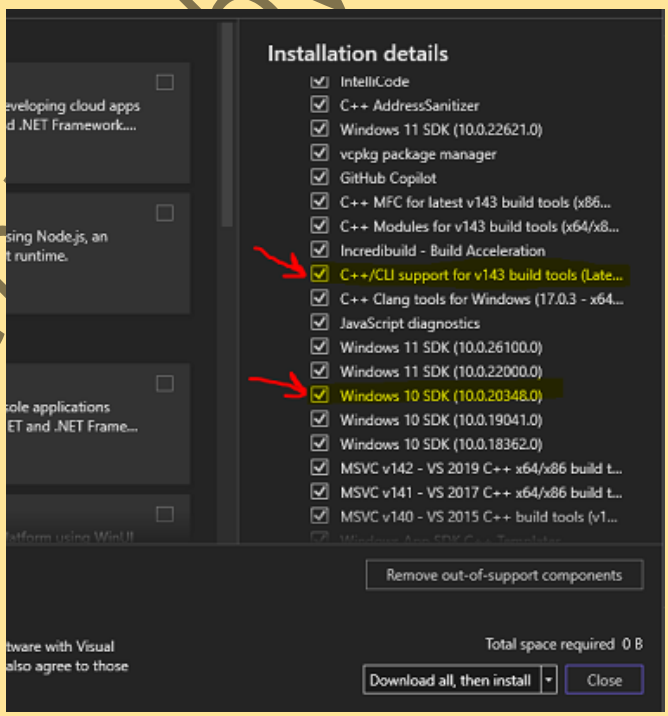


Figure 1.1.4: Check **Win.10 SDK** as well, since we will need it for bootstrap environment

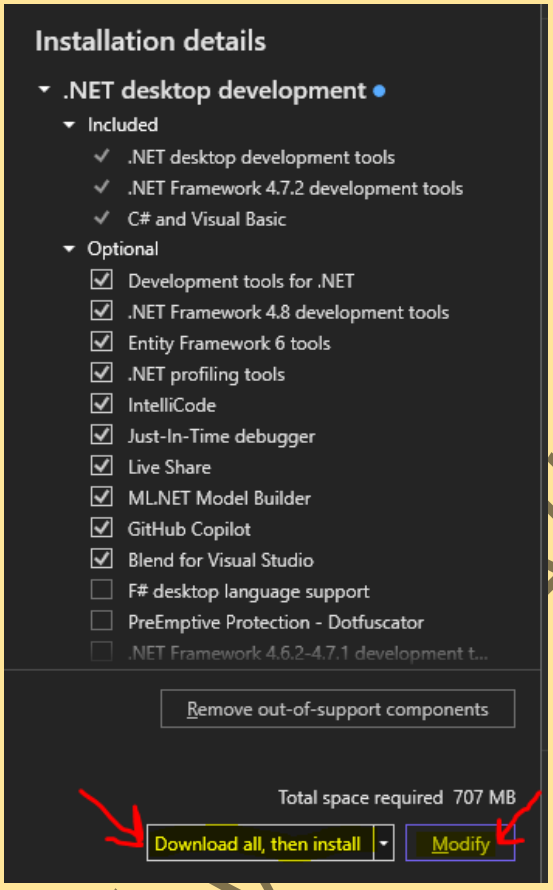
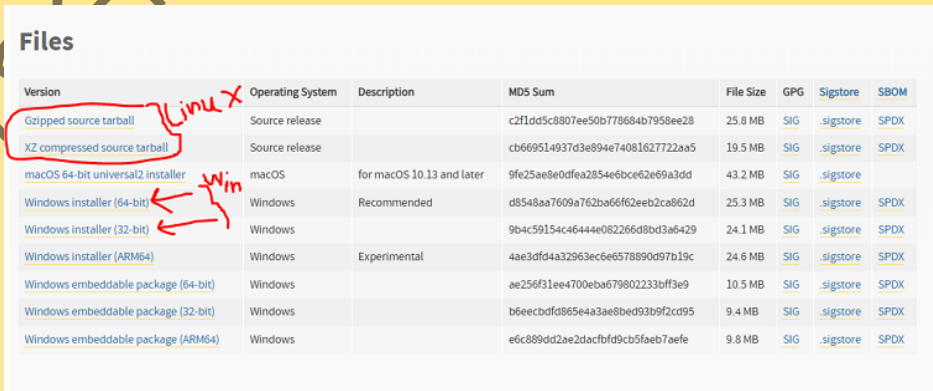


Figure 1.1.5: Between two install / download options, choose "Download all, then install" option, as it assures optimized downloading time and lighter workload on CPU.

- Note that after modifying Visual Studio, you need to restart that and while installation you cannot use it

1.2. Download, install and deploy Python3 on your system, since Mozilla's build system relies on Python dependencies, so based on your system's architecture, you should use one the following installers from bottom of the page as shown in the figure 1.2



Version	Operating System	Description	MD5 Sum	File Size	GPG	Sigstore	SBOM
Gzipped source tarball	Source release		c2f1dd5c8807ee50b778684b7958ee28	25.8 MB	SIG	.sigstore	SPDX
XZ compressed source tarball	Source release		cb669514937d3e894e74081627722aa5	19.5 MB	SIG	.sigstore	SPDX
macOS 64-bit universal2 installer	macOS	for macOS 10.13 and later	9fe25ae8e0dfea2854e6bce62e69a3dd	43.2 MB	SIG	.sigstore	
Windows installer (64-bit)	Windows	Recommended	d8548aa7609a762ba66f62eeb2ca862d	25.3 MB	SIG	.sigstore	SPDX
Windows installer (32-bit)	Windows		9b4c59154c46444e082266d8bd3a6429	24.1 MB	SIG	.sigstore	SPDX
Windows installer (ARM64)	Windows	Experimental	4ae3dfd4a32963ec6e6578890d97b19c	24.6 MB	SIG	.sigstore	SPDX
Windows embeddable package (64-bit)	Windows		ae256f31ee4700eba679802233bff3e9	10.5 MB	SIG	.sigstore	SPDX
Windows embeddable package (32-bit)	Windows		b6eecbdfd865e4a3ae8bed93b9f2cd95	9.4 MB	SIG	.sigstore	SPDX
Windows embeddable package (ARM64)	Windows		e6c889dd2ae2dacfbfd9cb5faeb7aefe	9.8 MB	SIG	.sigstore	SPDX

Figure 1.2. Choose installer based on your system type. If you do not know it yet, see **figures 1.2.1** and **1.2.2**, to determine your sys. Type.

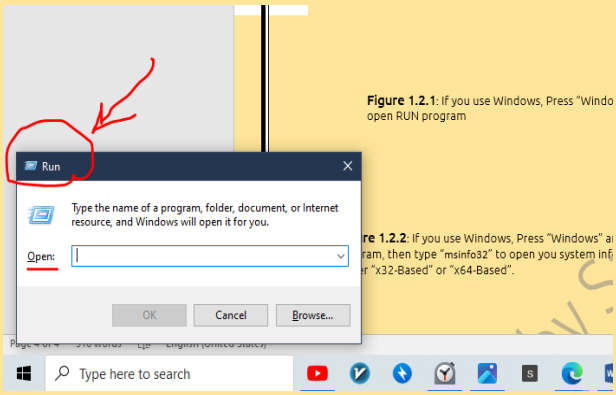


Figure 1.2.1: If you use Windows, Press "Windows" and "R" key at the same time to open RUN program. Then type "**msinfo32**" to open you system info.

Item	Value
OS Name	Microsoft Windows 10 Enterprise
Version	10.0.19045 Build 19045
Other OS Description	Not Available
OS Manufacturer	Microsoft Corporation
System Name	DESKTOP-AGL9DL2
System Manufacturer	LENOVO
System Model	81H7
System Type	x64-based PC
System SKU	LENOVO_MT_81H7_BU_idea_FM_ideapad 130-15IKB
Processor	Intel(R) Core(TM) i5-8250U CPU @ 1.60GHz, 1801 Mhz,
BIOS Version/Date	LENOVO 8QCN18WW(V1.06), 1/9/2019
SMBIOS Version	3.0
Embedded Controller Version	1.18
BIOS Mode	UEFI
BaseBoard Manufacturer	LENOVO
BaseBoard Product	LNVNB161216
BaseBoard Version	No DPK

Figure 1.2.2: There you see System Type, which can be either "x32-Based" or "x64-Based".

1.3. Download and install MozillaBuild packages from https://wiki.mozilla.org/MozillaBuild

1,3,1, Clone the Mozilla Central Repository, by typing the below bash command in Windows CMD; so that you don't have to download raw C++ sources separately, (I mean: .cpp files in https://searchfox.org/mozilla-central/source/)

```bash
hg clone https://hg.mozilla.org/moz
```

- Note that if CMD cannot recognize "hg" command, it is due to uninstalled Tortoise Hg, so you need to install it, as I show you in the next page.

1,3,2. How to install and configure Tortoise Hg?

1. 1st Step: Go to https://tortoisehg.bitbucket.io/download/index.html , now you must see this web page 👇

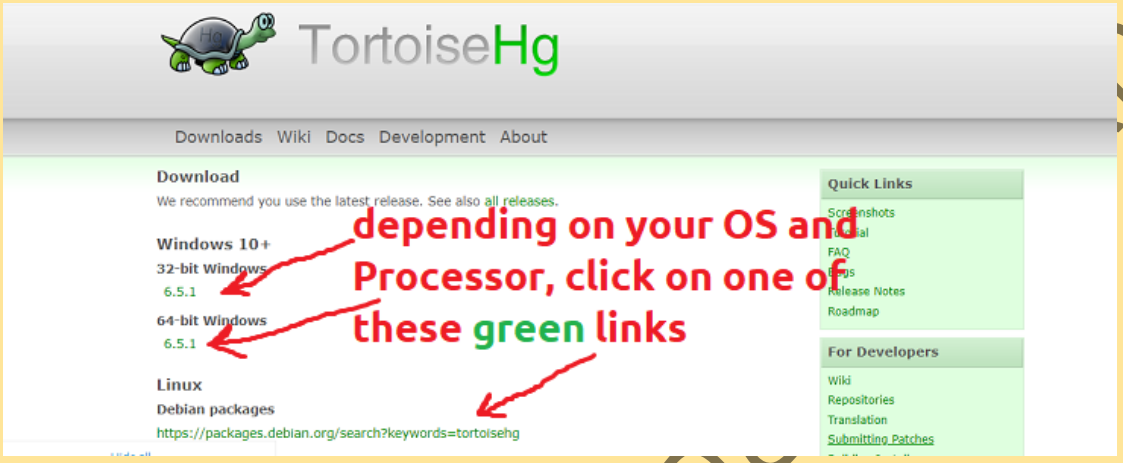
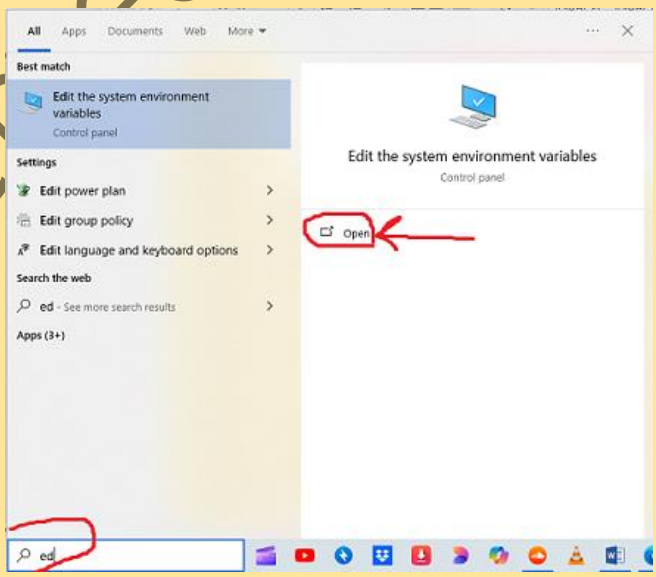


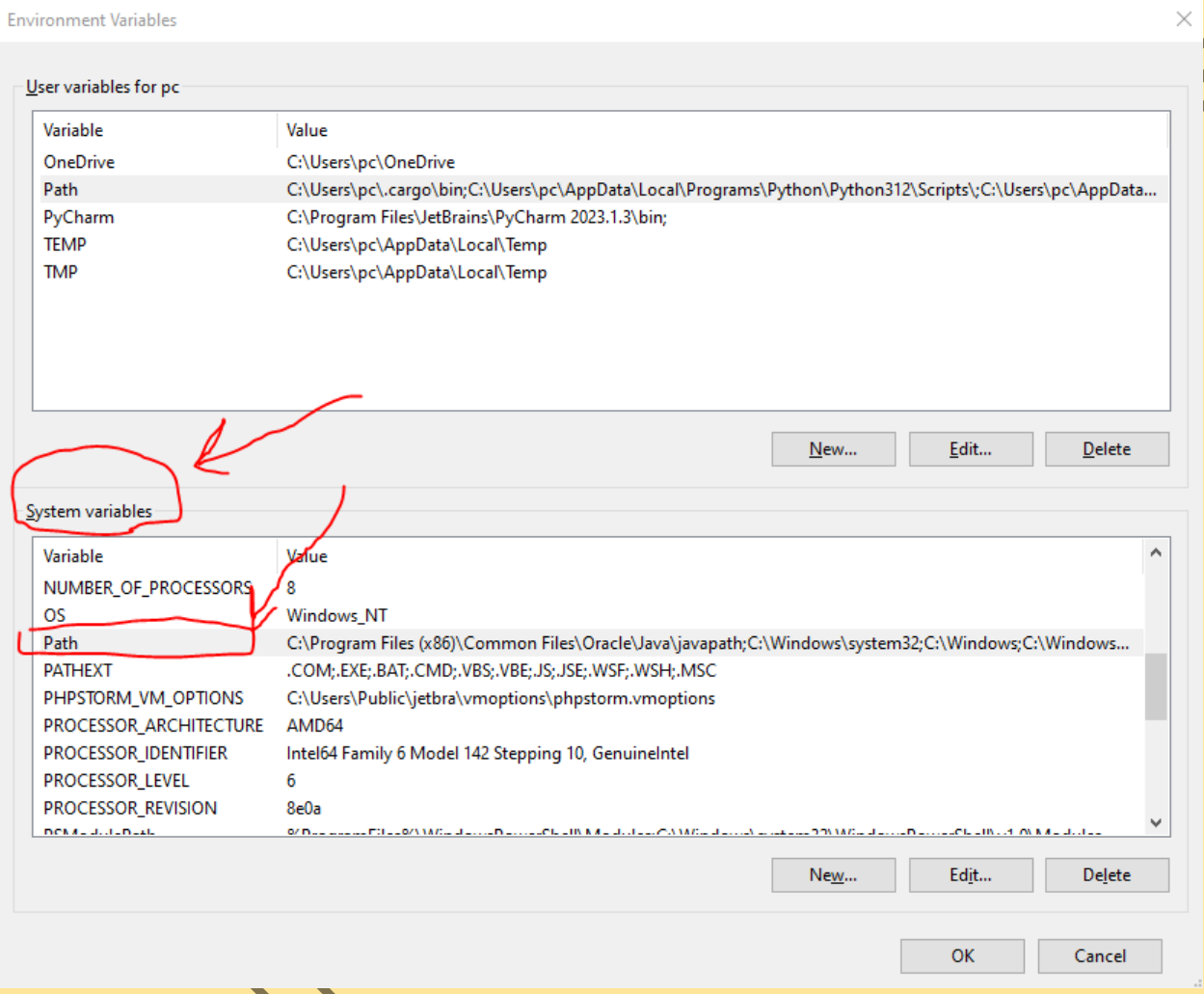
Figure 1.3.2: Click on of these links as mentioned in the image; if you are on Windows, find out your system type as guided in the previous section

2. 2nd Step: Add TortoiseHg path to System Environment Variable:

2.1. Type "Edit the system environment variables" in your window's search bar, and open.



2.2. Navigate to the System variables, and find "Path" variables.

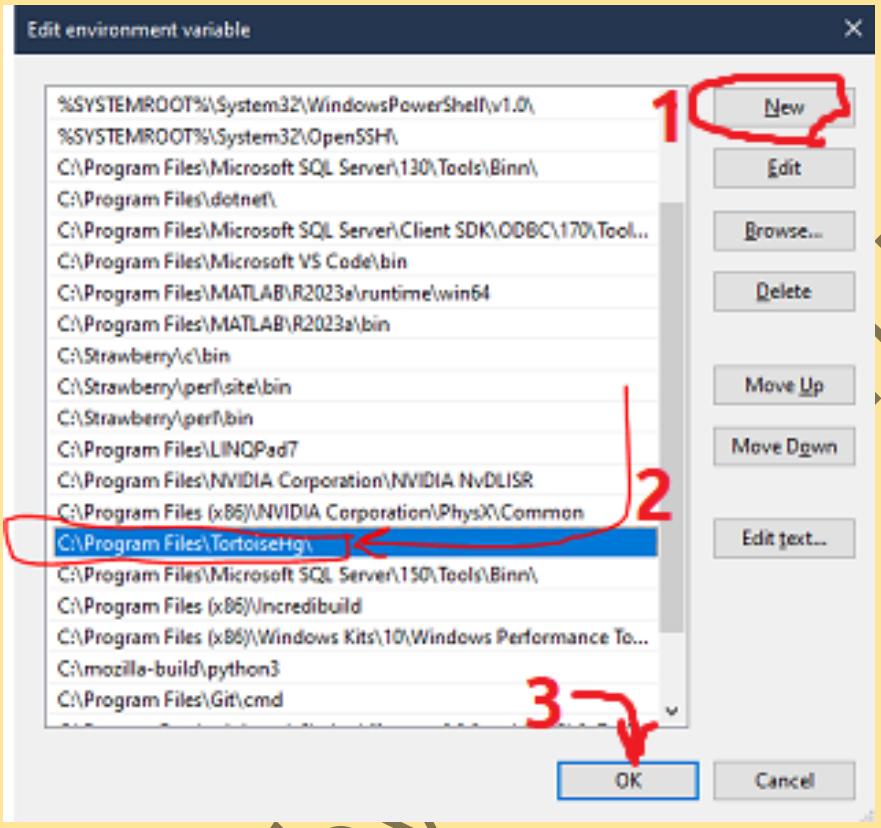


2.3. **Edit Path variable:**

Now copy path of Tortoise Hg and insert it as a new system environment variable as shown in the following screen shots.

- Note that the default path of Tortoise Hg varies among systems, but the most common path is ***C:\Program Files\TortoiseHg***

  ⚠ To make sure about the path, search the ToroiseHg.exe file in your system's explorer. It is recommended to use Everything app, which you can download from https://www.voidtools.com/downloads/



2.4. Test the Tortoise Hg configuration by running "hg" in CMD; and if you have configured it correctly; you will see "*Mercurial Distributed SCM*" message, and you are good to move on the next steps to create Mozilla Firefox installer.

1.3.3. Now that you have cloned Mozilla Build on your system, you should change your directory to where you have cloned Mozilla Build packages. Try typing the below command in **CMD** 👇

```bash
cd C:/Windows/System32/mozilla-central
```

- ❖ If it didn't work, just search for "mozilla-central" in *Everything* app , then copy and replace it's path after *cd*.

2nd Step: Build Environment Configuration

2.1. Download Mozilla-Build pack from https://www.dropbox.com/scl/fi/n5fd0a1118hquqhjt0blk/mozilla-build.zip?rlkey=iectp5uqhtwvh9f00x3r8xu6o&st=dbib6v27&dl=0

Password for extracting zip: persianfoxproject.org

2.2. In /mozilla-build directory, run .bat file, which is a shell command interface.

2.3. Change directory to path where you have cloned Mozilla Firefox source files in mozilla-central directory.

2.3. Run "**./mach bootstrap**" in the shell. Then you should see the following output from MozillaBuild CLI (Command Line Interface) 👇

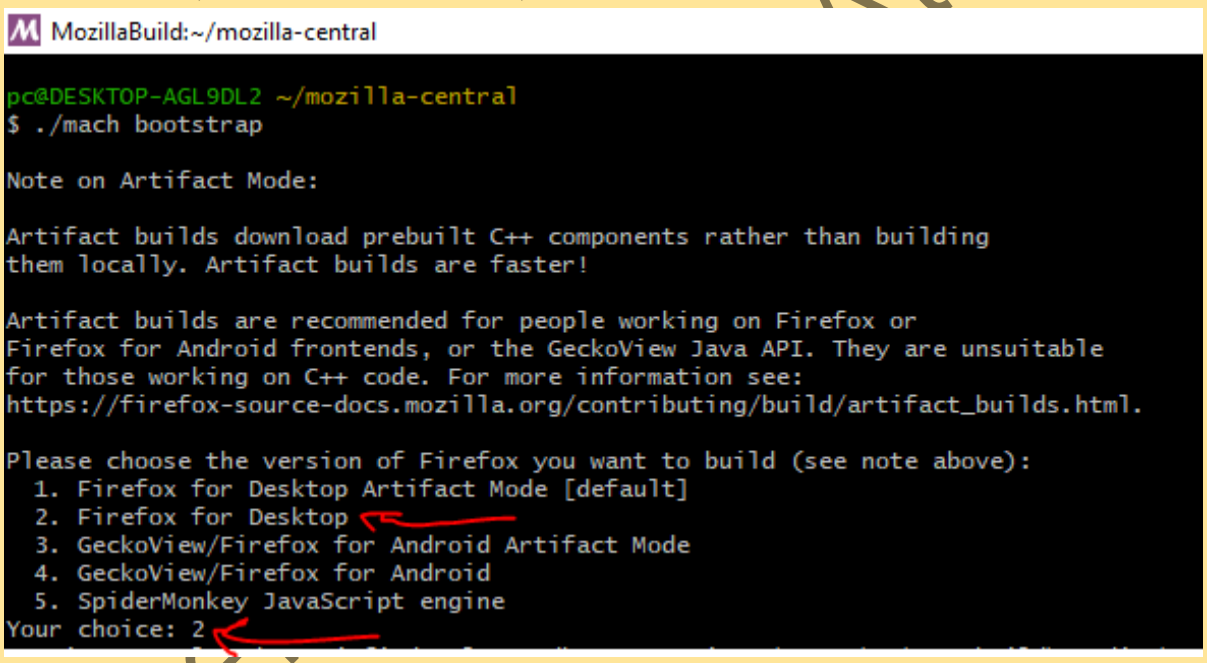


Figure 2.3.1: After seeing this choice list, please type "2" in order to carry on preparing bootstrap environment for building installer file named "mozmake.exe".

Figure 2.3.2: Successful output of second choice, which is the correct one to build Firefox installer for desktop platforms, according to prompts and logs of MozillaBuild CLI.

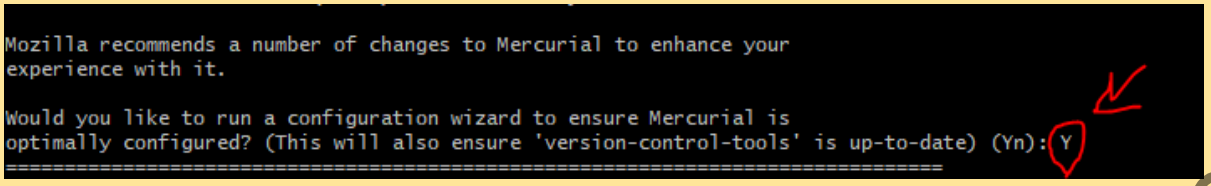


Figure 2.3.3: Then CLI asks you whether you want to configure Mercurial optimally or not. It is better for you that you agree and type "Y", then hit "Enter" key to let MozillaBuild CLI configure Mercurial optimally.

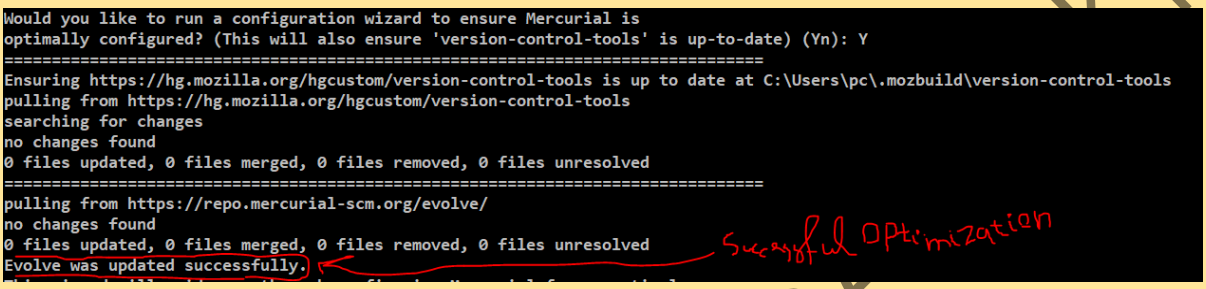


Figure 2.3.4: To make sure about your Mercurial configuration's accuracy, please check the console log; so that if the operation has been successful, you can see the red-highlighted message from CLI's LOG.

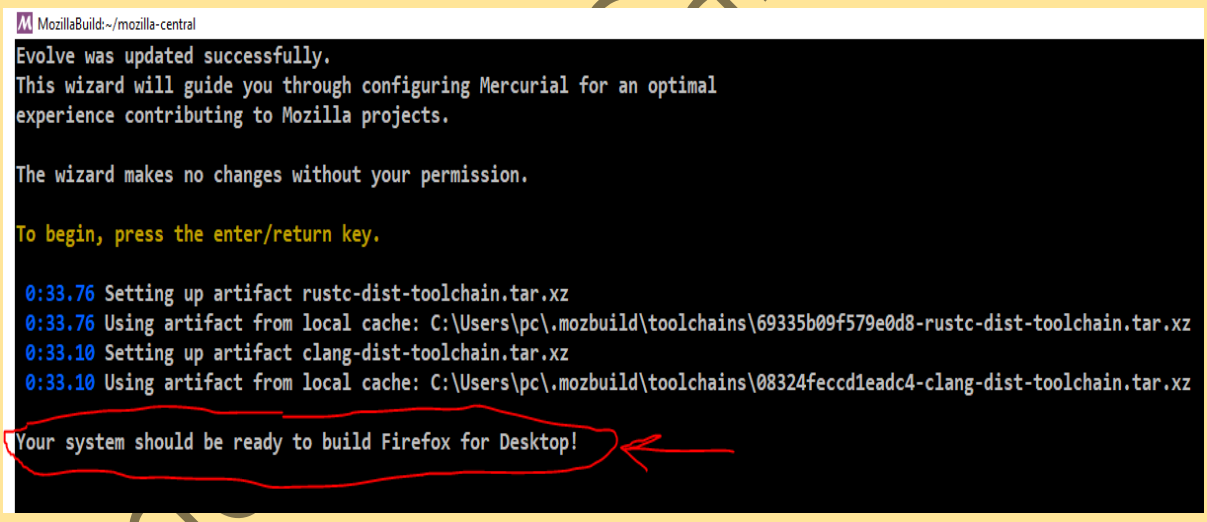


Figure 2.3.5: Now you only need to hit "***Enter***" key; so that the process would be good to go on until you see the red-highlighted LOG indicating that we are ready to execute ***"./mach build"*** which is a UNIX-based command afterwards.

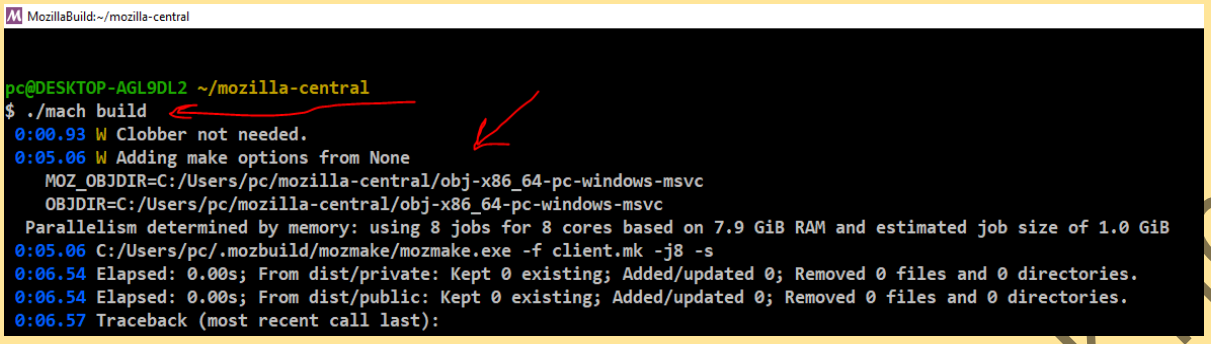


Figure 2.3.6: After successful bootstrapping, now you can build the Mozilla Firefox by running "*./mach build*" command in MozillaBuild CLI. Then result should look like the above LOG shot displaying RAM capacity and number of CPU cores. Otherwise you have had made a mistake before you reach this point.

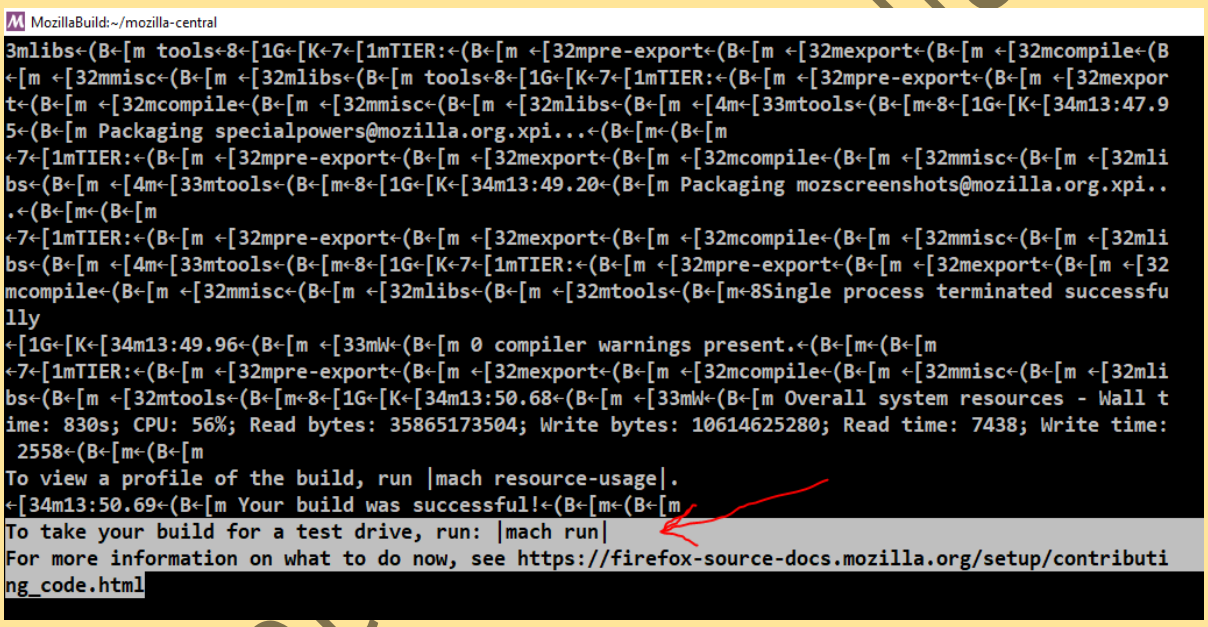


Figure 2.3.7: If your building process has been successfully executed, you should see the above highlighted message telling us about another command, which can be run to test our build process; afterwards you can package the installer executable file to setup your own modified Mozilla Firefox, using original or modified source code files.

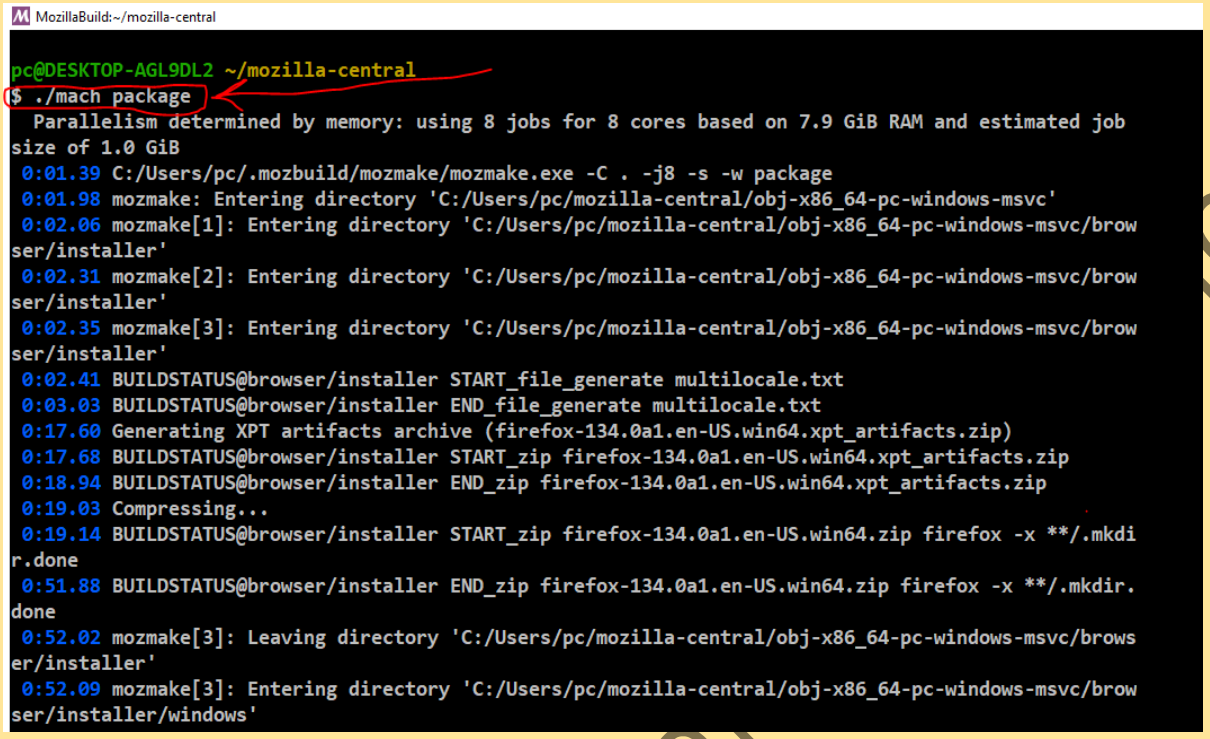


Figure 2.3.8: After you see the previous guidance message providing a URL of user-manual article, now we should create a package of setup files for our customized Mozilla Firefox.

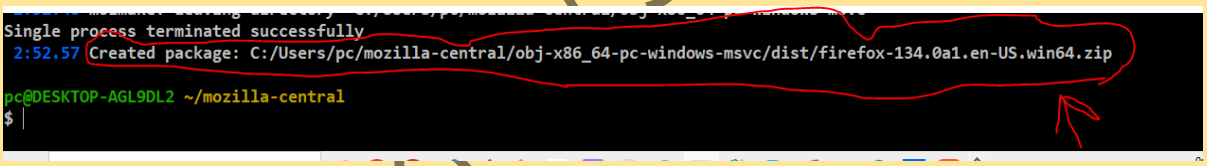


Figure 2.3.9: Finally your installer executable file is ready.

R&D, Documentation, Deployment and Installation

By

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