How To Load TCVM Onto Your iPhone/iPodTouch

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There are a few software and hardware requirements that must be met for you to load TCVM on the iPhone/iPodTouch.

Software requirements:

- RedSn0w software to JailBreak your iPhone/iPodTouch
- A software package installer for your iPhone/iPodTouch
- Software to connect your computers (my examples will be using MS-Windows) to your iPhone/iPodTouch
- WinSCP (http://winscp.net/), and/or PuTTY or equivalent software for SSH & FTP access to your iPhone/iPodTouch
- The iPhone/iPodTouch software OS distribution for your device
- Itunes 8.x
- SBSettings for your iPhone/iPodTouch
- Cydia

Hardware requirements:

- An iPhone/iPodTouch with iPhone OS version 1.14, 2.x or 3.x operating system
- A wireless router (typical home/office configuration) to provide a WiFi connection between your computer and your iPodTouch/iPhone

Your iPodTouch/iPhone runs a highly optimized version of MacOS-X (BSD based OS) tailored to the unique needs of these mobile devices. They ship from Apple® with the OS configured such that access to the operating system or the ability to modify the OS or its applications by third parties has been disabled. The first step that needs to be taken is to change the configuration such that we can load

software and access the OS/utilities that are found on the device. The process of enabling this access is referred to as Jailbreaking your iPodTouch/iPhone. Note that this process is not condoned by Apple and may in fact void your warranty, cause your device to work unreliably, crash etc. The good news is that using iTunes, in the worst case scenario, you can restore your iPodTouch/iPhone from the last backup made by iTunes, or even to its factory default configuration. If your device is an iPhone, in addition to jailbreaking, its also possible to unlock your iPhone. Unlocking is the process of allowing your iPhone to work with compatible cellular providers other than the one that Apple has partnered with within a given coverage area. While the first step of unlocking an iPhone includes jailbreaking the phone, unlocking an iPhone is not necessary for loading TCVM and is not covered in this guide. Also, this is just one way to load TCVM and applications onto your device. The TC Companion also tersely describes other ways to download the TCVM and other applications onto your device.

Jailbreaking your iPhone/iPodTouch

In order to Jailbreak your iPhone/iPodTouch, we need to load a modified version of the device's OS that will give us access to the operating system, its utilities, and also change the code-signing mechanism that is used to limit the applications that can run on the device. So, the first step is to find a copy of your device's software distribution that can be patched and loaded back onto your device. If you've ever updated the software on your device, you'll be able to find your device's OS software (commonly referred to as an "ipsw" file) in this location (if running Windows):

```
C:\DocumentsandSettings\"Computeruser"\ApplicationData\Applecomputer\iTunes\iPod Software Updates
```

The file will have a name similar to this: `iPod2,1_3.0_7A341_Restore.ipsw,` and "Computeruser" is the name under which iTunes was originally installed.
If you have never updated your device, or for whatever reason, don't have the above file, it can be found online. Make certain that you download the correct file for your device. If you use the wrong ipsw file, your device won't reboot correctly, and RedSn0w will end up waiting indefinitely with a message reading "Waiting for Reboot". If you need to download the ipsw file, note that the file may have been saved as a ".zip" file. If the file gets saved onto your computer as a .zip file, just change the file suffix back to ".ipsw". Its also important to make sure that you use the correct ipsw for your device. So, you need to know if the device is a 1G iPodTouch or iPhone, iPhone 2G, iPhone 3G or iPhone 3GS. There are separate versions of ipsw available for 1g/2g/3g version devices (google it to find locations that host these files). You may try "blogsdna.com/3742/download-custom-ipsw-30-for-iphone-3g-2g-30-ipod-touch-30.htm" and download the version for your device and OS version. There are sites that host both standard and customized ipsw files for the various hardware devices.

Using RedSn0w to JailBreak your Device

Download RedSn0w (I used version 0.72) software (its cross platform) onto your computer, and follow its instructions. Redsn0w works by patching the device firmware file on your computer, then loading it onto your device without using iTunes. When asked to specify an "ipsw" file, navigate to and select the ipsw file from the section above. Step by step directions on running RedSn0w can be found on many sites, and within the software itself. The key part is to make sure you've got the correct ipsw file, and that you follow the directions. My advice is to read the directions through completely before you get started with RedSn0w. Accept RedSn0w's defaults, and install the Cydia package loader onto your device. Cydia is a very popular replacement for Installer, which apparently is getting retired.

Enabling SSH

Ok, if you've made it this far, it means that you've successfully jailbroken your device, and should now have Cydia installed onto your device (RedSn0w should have automatically installed this for you). The next step is to install utility software to allow us to turn on/off various settings on your device. BossPrefs is a very popular Settings Editor, but its support is getting phased out, so its better to use Cydia to install SBSettings. Once installed, use SBSettings to make sure WiFi is turned ON, and write down the IP address assigned to your device. If your device doesn't have an IP address assigned, make sure that you've connected to a wireless lan with your device (use the Settings, WiFi option to connect). You'll also need a wired/wireless connection to the same lan with your desktop/laptop computer. Lastly, use SBSettings to also make sure that SSH is turned on.

Use WinSCP (or equivalent) to connect to your Device

Launch WinSCP and configure it to connect to your device. You need to configure WinSCP and set the username to “root”, and the password to “alpine”, the default password on your device. Later on, you may want to change the default to something else. Note that you can also use PuTTY to log in to a remote shell on your device. From the PuTTY command prompt, you can run many of the standard Un*x commands that you may be familiar with. For now, however, use WinSCP to connect to your device via SFTP. Tap the “New” button to start a new session. Enter the IP address of your device for the Host name, and enter “root” and “alpine” as the user name and password. Next, tap the Login button. In just a few seconds, you should be connected to your device. If you have any problems, double check your settings:

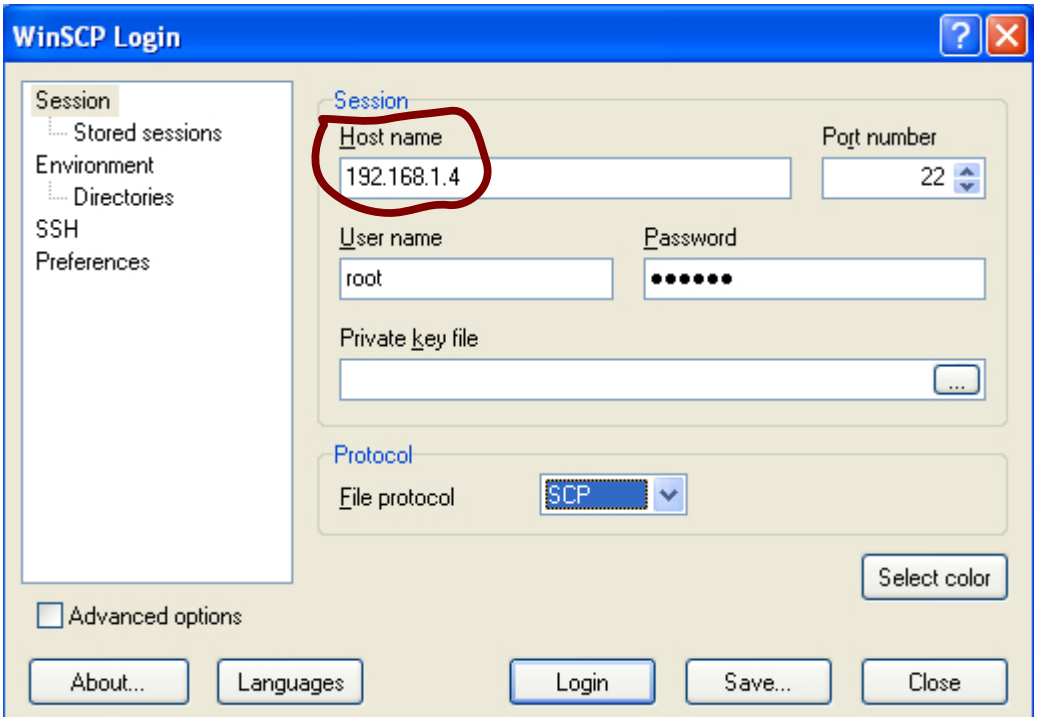
Hostname (or serverip): the device's IP address

Username: root

Password: alpine

File Protocol: SFTP

Here is a screen shot of how WinSCP should be configured (note that your device's IP address has been highlighted as what needs to be entered in the Host name field):



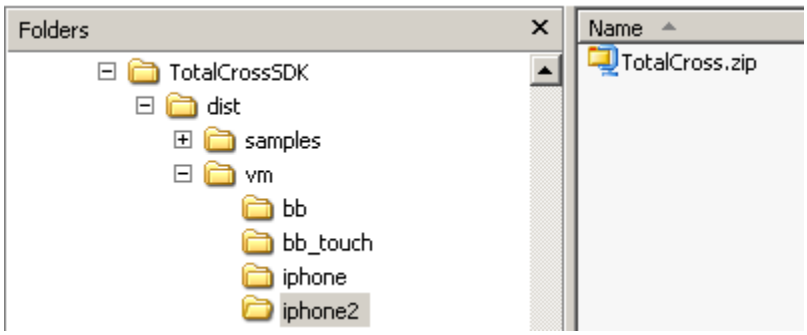
Tap “connect” or “Login” (may be different depending on your version of WinSCP) and after a few seconds you’re connected to your device! Note: It would be better to turn OFF SSH from once you're finished with your device, for enhanced security.

You will see a confirmation message asking if you will accept key exchange / connection with the device. You’ll need to say Yes or Allow at these dialogs.

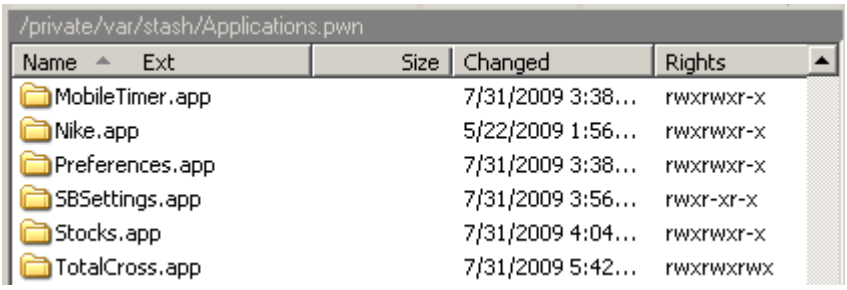
Loading the TCVM via WinSCP

Once connected, you are presented with an Explorer-like view of the file system on your device, and your own computer. Once there, you can copy files and folders back and forth between the computer and your device.

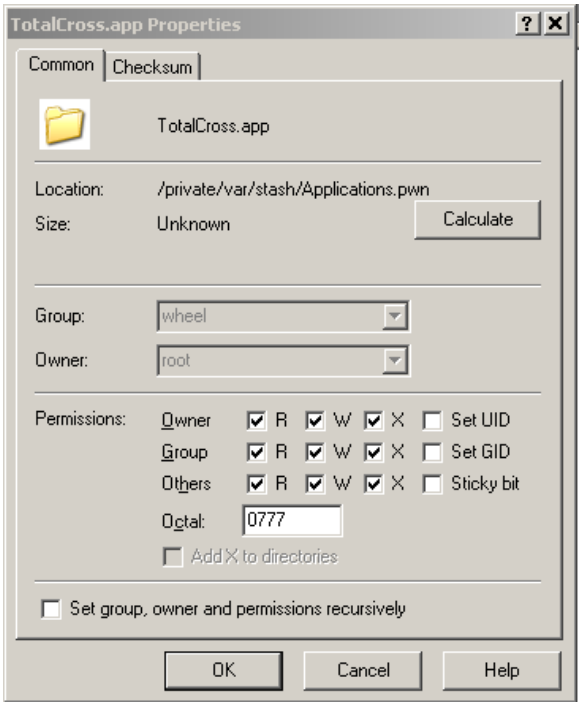
From the TotalCrossSDK folder, you'll want to navigate to the iphone2 folder, as the iphone folder is only for OS1.14 devices (of which there are probably not a lot around any longer). For devices later than OS 1.14, take the TotalCross.zip file, and uncompress it into a folder called TotalCross.app. The iphone2 folder (before unzipping) within the TotalCrossSDK is found within the TCVM distribution path described below. You'll want to create a folder called TotalCross.app, and unzip the contents of TotalCross.zip into the folder.



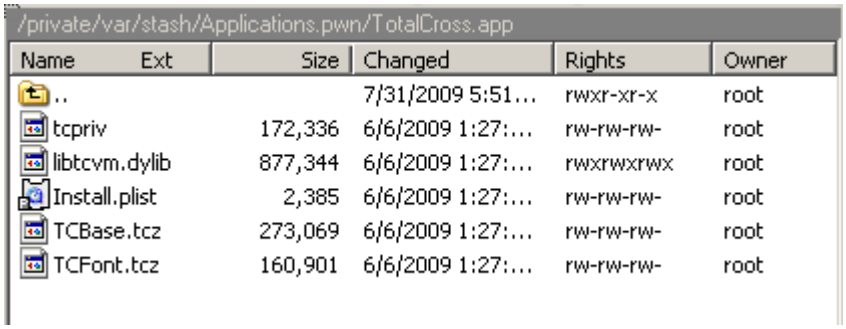
Copy the TotalCross.app folder over to \Applications on your device using WinSCP. When it is done copying, you should see TotalCross.app on your iPhone/iPodTouch in the directory path listed below:



Next, you'll need to change the properties associated with TotalCross.app and its contents. Right click on TotalCross.app within WinSCP, and a properties dialog box will appear that will let you set the properties associated with the highlighted file/folder:



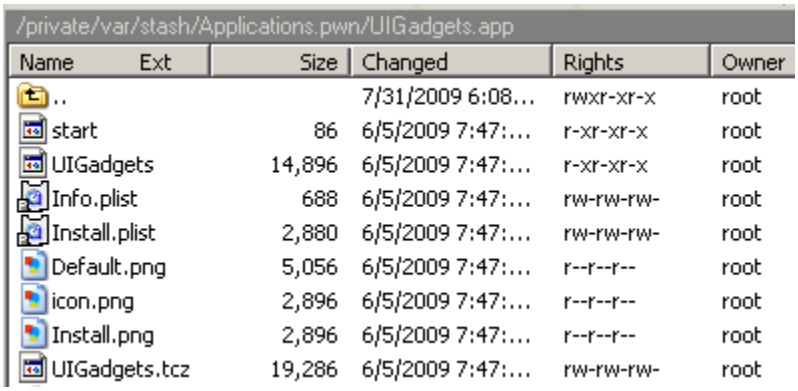
The permissions attributes to the folder (and its contents) need to be set correctly. You can either set these recursively, and then go and reset those permissions that don't make sense, but either way you want to end up with something like this:



Where, in the above example, the critical attributes are those assigned to libtcvm.dylib.

Loading a sample application (UIGadgets)

Try installing a sample Application (in this case UIGadgets.app) from the TotalCross Samples. One way to install UIGadgets is to use the same method outlined above for the TCVM. Another way to install UIGadgets would be to install it "over-the-air", using the procedures outlined in the TotalCross Companion. Once installed, the UIGadgets folder on your device should look something like this:



And pay attention to setting the Rights/Attributes bits correctly. Pay attention to start and UIGadgets, they have to have the execute bit set.

Now, if everything has been completed correctly, you should be able to tap on UIGadgets from the SpringBoard and it should automatically launch the VM and run UIGadgets!

Making screen snapshots of your device

There are several ways to take screenshots of your device from your Windows (or other OS) based computer. One way is to load the Veency package on your device, and then run your favorite VNC client on your computer (like TightVNC, UltraVNC etc.) to connect to your device.