

KD4Z Toolkit Virtual Machine 4.0 – Release Notes – January 2018

Over the past year, I had intentionally not updated the 3.x VM image, as the internal Toolkit scripting has ability to fully update itself. This has worked out very well, as I know it is a very large download. I wanted to avoid forcing the user to keep downloading large image files – just for updates. As you already know, that design works quite well to that end.

However, some of the new features I had in mind needed to be added using the root user. The VM is designed to run everything as a non-privileged user in order to protect the user from breaking anything. So, I collected my notes over the past 12 months, and rev'd up the VM image with those features in mind. The KD4Z Toolkit Virtual Machine image is born!

Differences from the 3.x VM Image at a glance:

- The VM now has the Virtual Box Guest Additions installed:

This adds much better mouse handling!

Adds ability to create a shared folder to the Host machine for easy file transfer in or out.

Adds the ability to scale the window size of the running VM.

- The VM now has an SSH server running on port 22. (Openssh server) This allows you to “shell” into the VM. Mainly, this gives you the ability to scroll back the screen using your SSH terminal client such as Bitvise SSH Client. Be aware that a shell session does not redirect the USB port, so you can't initiate any “flash” operations from the shell. You still have to run those operations from the normal VM console.

Also, the SSH server allows a SFTP client (like the one in Bitvise) to connect and make easy work of file transfer in or out of the VM using secure FTP. If you haven't heard of Bitvise, you should go check it out. It's FREE!

<https://www.bitvise.com/ssh-client-download>

[Download Bitvise SSH Client \(Tunnelier\)](#) 

Bitvise SSH Client installer - version 7.36, size 21.8 MB.

- The VM also has a normal FTP server running. You can connect directly to the VM from your host machine using your favorite FTP client such as Filezilla. <https://filezilla-project.org> You could use this feature to upload your codeplug file into the VM for use with the `rtdwrite()` command.

- The VM has a mini HTTP server running to serve up the screenshot directory. This allows you to browse to the IP address of the VM using a normal web browser. The base directory is “screenshots” This is the landing directory for the new “snap” screenshot command. Also, after a `glv` or `glvusers` command, the two freshly created firmware bin and user.bin files will be available here. So, you can simple download them using a web browser if you wish to use them in with another flash tool such as TytFlashTool.

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```
tytV4 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
tyt@DmR:~/screenshots$ ls -l
total 5932
-rw-r--r-- 1 tyt tyt 999936 Dec 21 07:53 firmware-GPS.bin
-rw-r--r-- 1 tyt tyt 995840 Dec 21 07:53 firmware-noGPS.bin
-rw-r--r-- 1 tyt tyt 4070834 Dec 21 07:53 user.bin
tyt@DmR:~/screenshots$ stats
```

- The help menu has a few new commands, one of which is *stats*.

```
tytV4 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
KD4Z Toolkit Stats
IP Address      : 192.168.11.165
Host Uptime    : 09:20:59 up 5 min, 1 user, load average: 0.00, 0.03, 0.03
Last build
Firmware Bin   : 995840 Dec 21 07:53 /home/tyt/firmware-noGPS.bin
Firmware Bin GPS : 999936 Dec 21 07:53 /home/tyt/firmware-GPS.bin
Contact Data
Contact datafile : 4234200 Dec 21 07:53 /home/tyt/user.bin
DMR-MARC count  : 80219
Contact records : 80445
menu           -- Back to main menu
tyt@DmR:~/screenshots$ _
```

The Stats screen displays information about the VM and firmware binary files. Use this screen to determine the IP Address of the Virtual Machine itself. You will need the network adapter configured in Bridged mode for the VM to obtain an IP address on your local network. (see more about that further down in this document)

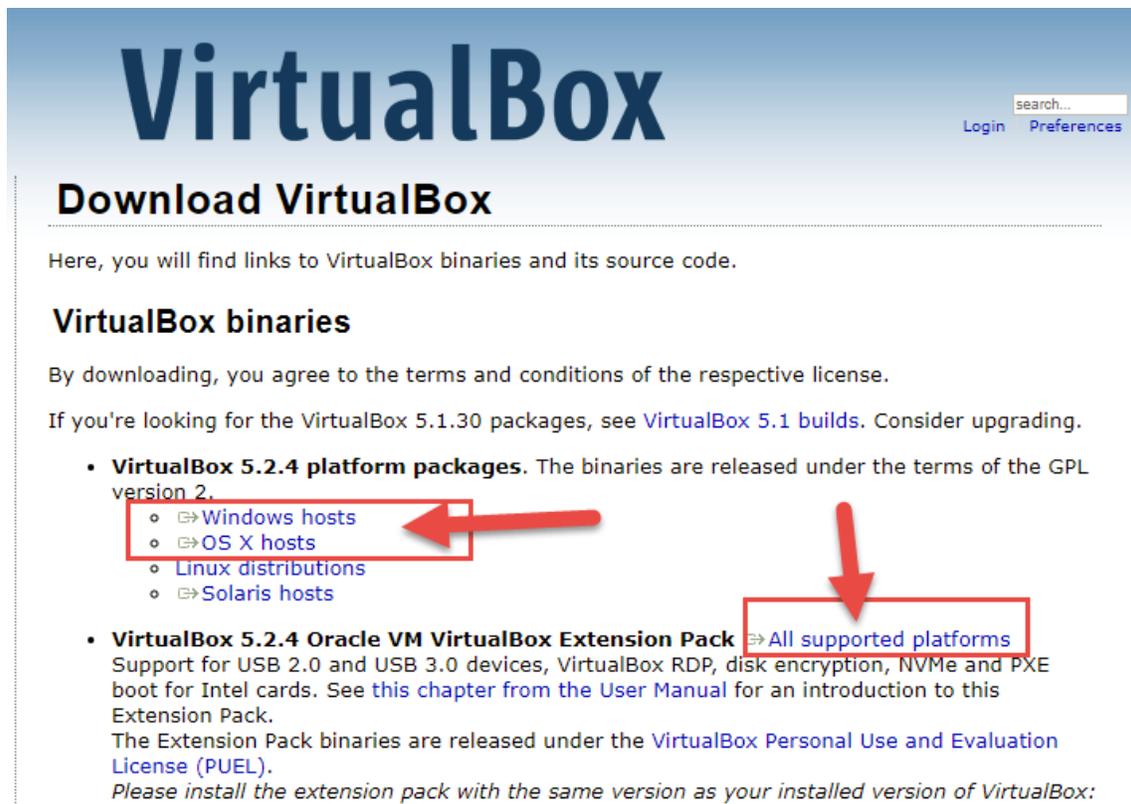
If you open the IP Address in a web browser, you will see the same files from the screenshots directory. You can click on the links and download any files found in this directory. (Note: Use the IP Address for your VM here!)



Installing or Upgrading VirtualBox

The version 4.0 VM image will only be available initially configured for Oracle VirtualBox. Support for VMWare will come a little later) Before importing the 4.0 image, this would be a good time to first download and install the latest version of VirtualBox available for your desired platform. Download it from here:

<https://www.virtualbox.org/wiki/Downloads>



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Choose the link for either *Windows hosts* or *OS X hosts*.

If you already have an older version of VirtualBox installed, don't uninstall it before updating! Just run the installer and it will update the existing version, and keep your existing the installed Virtual Machines. Be sure to download and install the newest available *VirtualBox Extension Pack* as well.

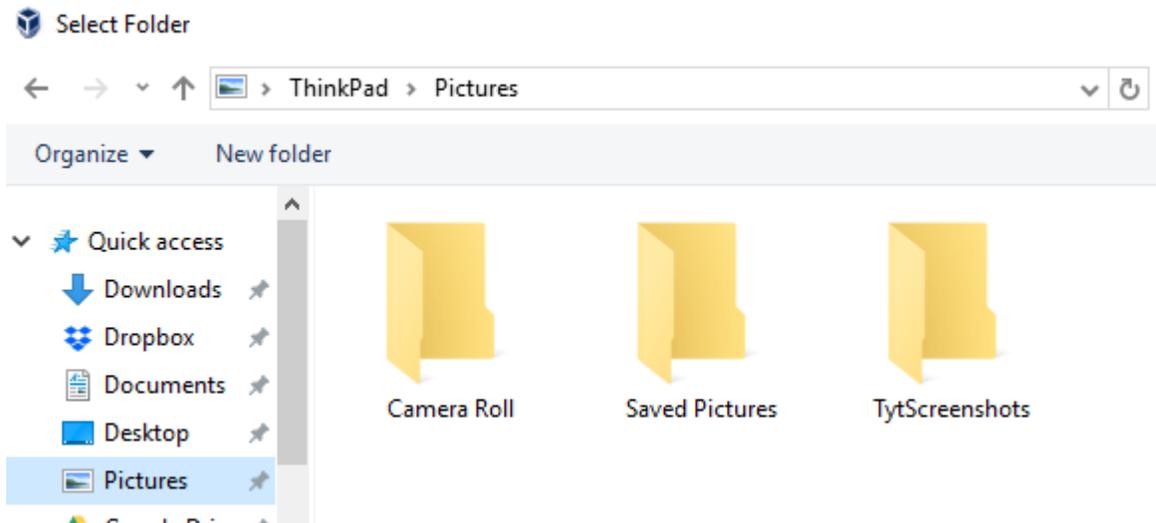
NOW REBOOT! You must reboot to properly finish the VirtualBox installation!

Download, and extract the KD4Z Toolkit VM image file. See last page for If you downloaded image in multiple parts, you will need to use the 7-Zip program to reassemble the OVA file. Launch Oracle VirtualBox and Import the tyt_kd4z_4.0.ova appliance file from the File | Import Appliance menu item.

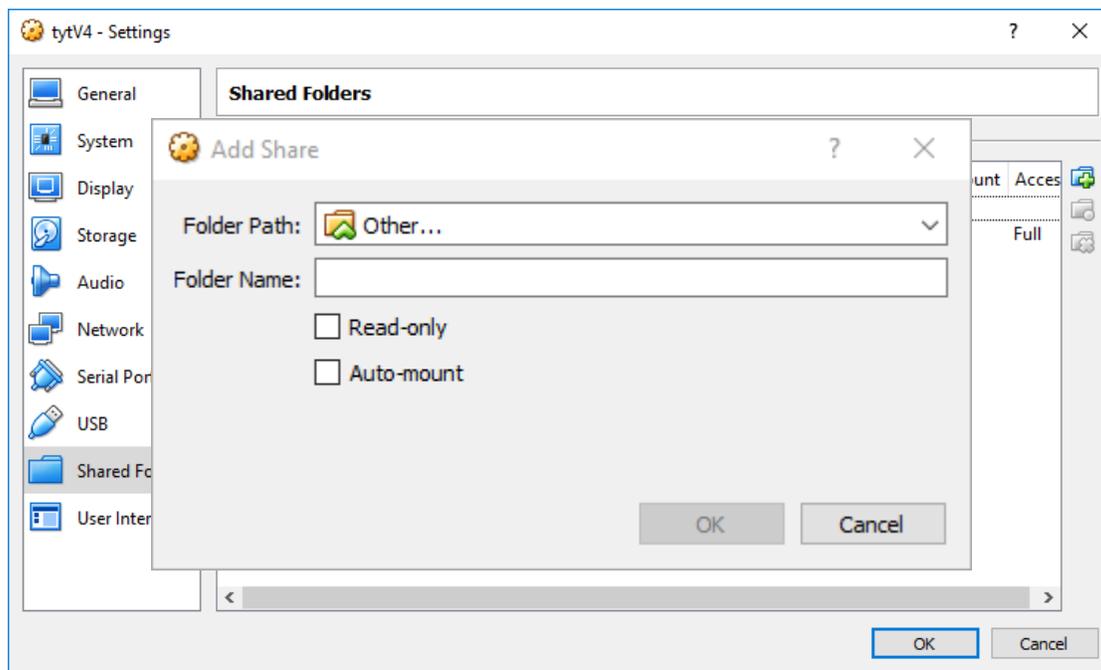
Don't start the VM yet!

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After you Import the 4.0 VM image, you will want to add a special folder on your Host machine. Then, you can map it as a Shared Folder in Virtual Box. The folder can be anywhere on your local Host's drive. If you are using Windows, I suggest putting it under "My Documents" Pictures folder. You must name it "TytScreenshots" just like you see in these screenshots.

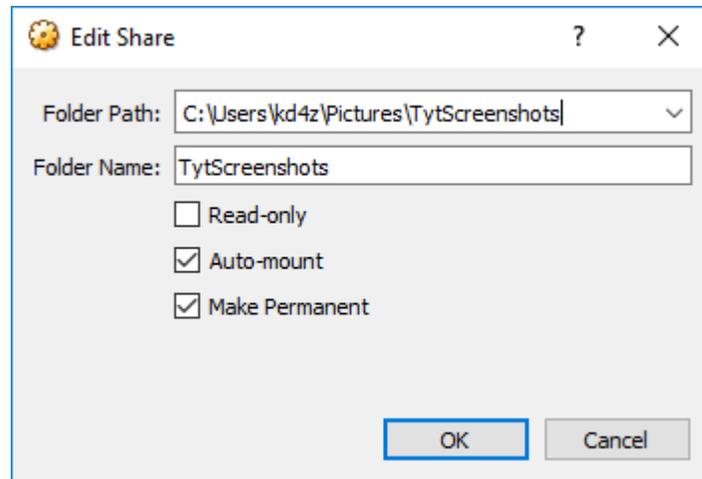


Then, from the Settings menu for the VM, add a Shared Folder and select that same folder you just created. It will look like this when done, except your selected path will be shown.



Be sure to put a check mark in the "Auto-mount" option. When I went back to grab a screen shot, there was another checkbox for Make Permanent. I didn't actually check that, but it seems to be needed.

THE IMPORTANT PART IS: The “Folder Name” as seen in this configuration **MUST** be named “TytScreenshots” or the **snap** command inside the VM will not be able to find it.



When you start the VM, you will see there is a read/write mount point added under /media called sf_TytScreenshots. The VM has the tyt user added to the “vboxsf” user group so it has access to this mount point. (That’s a Linux thing)

 tytV4 [Running] - Oracle VM VirtualBox

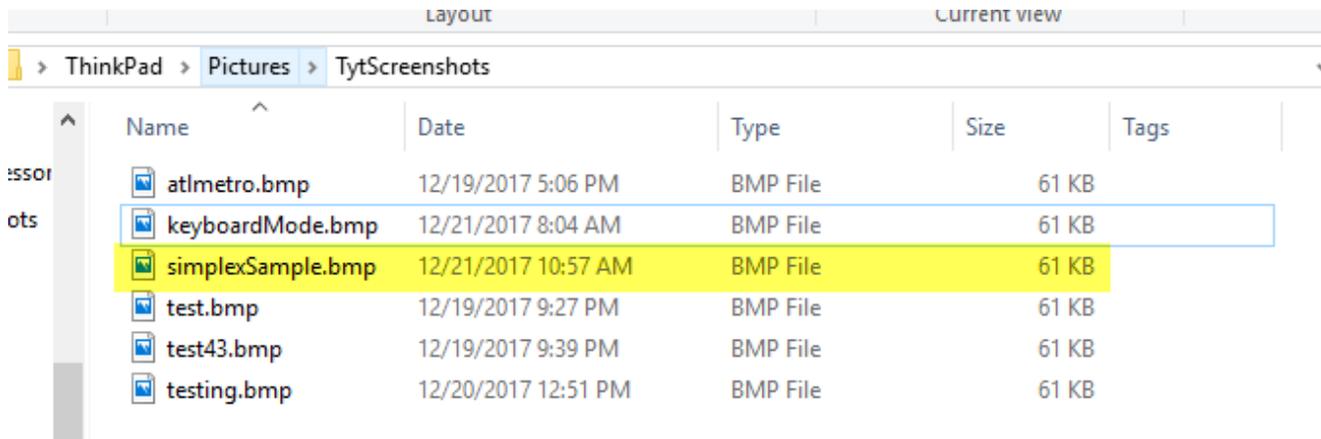
File Machine View Input Devices Help

```
tyt@DmR:~/screenshots$ mount | grep shots
TytScreenshots on /media/sf_TytScreenshots type vboxsf (rw,nodev,relatime)
tyt@DmR:~/screenshots$
```

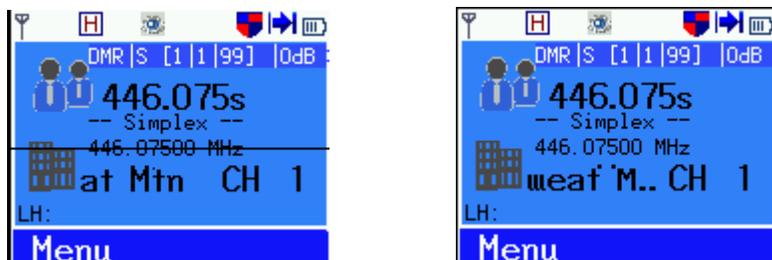
What does used for? If you run the new **snap** command followed by the desired (and required) filename. Note that it must have a .bmp extension to be viewable.

```
tyt@DmR:~$ snap simplexSample.bmp
Saving screenshot to filename: simplexSample.bmp
Copying to TytScreenshots shared folder on host
tyt@DmR:~$
```

Then, go look in your TytScreenshots folder on your Host machine, you will find your bmp file is already there!



The **snap** command leverages a new feature added recently by Mike, DL2ME. It grabs a copy of the screen buffer memory from the connected radio, and writes a bitmap file inside the VM. Due to the way it grabs that data, sometimes you may not get a clean image. Just run the command again to get another screenshot.



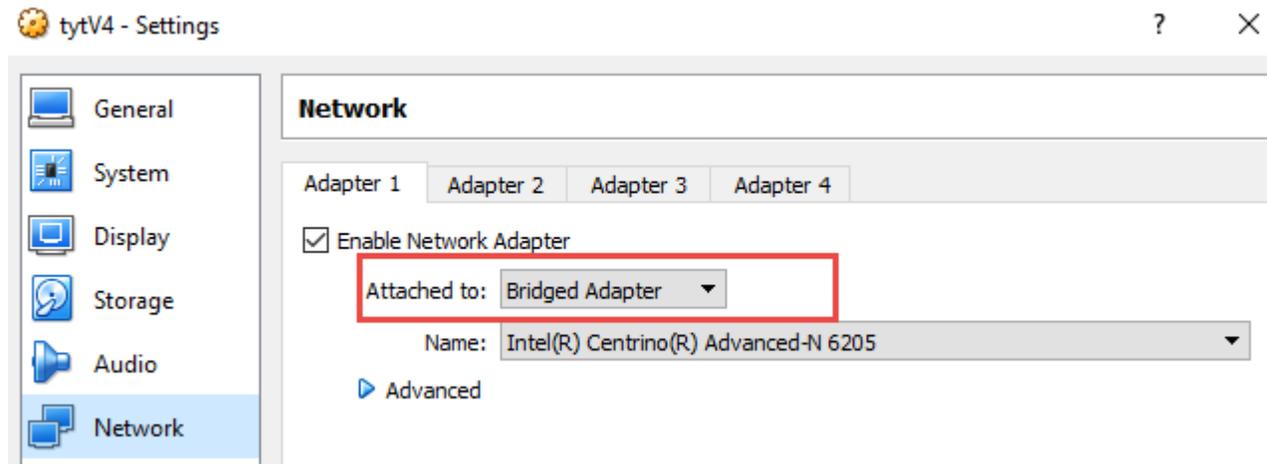
I have also added the **rdtread** and **rdtwrite** commands to the menu. These commands were actually available in the v3.x VM for a long time now, just not listed on the menu. These two commands allow you to read and write codeplug files to the radio using the VM. Note: The **rdtread** command only creates a “binary” (bin) files. Sorry, it doesn’t have the proper headers to be used by the Tyt CPS program.

However, you can write RDT, DFU, or BIN files using the **rdtwrite** command. I use these commands with the **rdtpassreset** command, to read the codeplug, patch it, and write it back. Same goes for the **rdtblank** command.

By having the VirtualBox Guest Additions installed inside the VM, mouse functionality is vastly improved. In order to take advantage of the mouse support, you should make sure your “Pointing Device” is set to the actual type of mouse you have! In the past, we have been recommending you swap it to PS/2 Mouse since you likely don’t have one. Now, we want to actually select the SAME type as you actually have!

WHY you ask? Well, you will notice that the mouse no longer gets captured by the VM if you click in the VM window! It moves in and out as you would expect from a normal Windows application.

Finally, in the prior discussion of the new the **stats** menu, it was mentioned that a slight change in the VM network might be needed. That setting is that may have to change the Network setting for “Attached to” to be Bridged Adapter.



This is because the default setting of “Nat” will instruct VirtualBox to assign the VM an internal IP address instead of a real IP address from your network’s DHCP server . That internal address is inside the Virtual Box’s internal network router, so you can’t access it from outside the VM. When set to Bridged Adapter, you should see the VM get an IP address from your local network.

Of course, you need to configure this change with the VM shutdown.

Where do I get the image?

As always, the current links for the VM image can be found on the project site on Github:

<https://github.com/KD4Z/md380tools-vm>

Scroll down the page a bit for the link descriptions.

That’s about it. Enjoy the new features of the KD4Z Toolkit.

Warren Merkel, KD4Z