Chapter 15: How to Install DCALC* on VirtualBox

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15.1 Introduction:

In this chapter, I describe how to install a "virtual machine" running DCALC on a Windows host computer. The virtual machine will appear on the host computer as a separate computer with the Windows XP operating system. Calculations and PDF output files are easily shared between the virtual machine and the host machine. Using this arrangement provides users with a stable, secure and permanent platform for running DCALC, without the hassles created by Windows 10 and problems caused by AV software. The DCALC virtual machine, which is "sandboxed", actually works better.

15.2 History of DCALC

When I began DesignCalcs, Inc. in 1991, there was no Internet or email. I wrote DCALC as simply "number crunching" software, to be used by structural engineers. It is an engineering tool, period.

The software was originally written in DOS and was distributed on floppy disks. In the early 2000's, in a huge undertaking, I converted almost all of the programs from QuickBasic to VisualBasic 6. Using VB6 on a computer running Windows 98, I developed a system of software writing tools that are unique to DCALC, allowing me to write software very productively. All DCALC programs use the same software components.

Over 30 years, I have received extremely positive feedback from structural engineers:

- Many users have made contributions to DCALC, providing feedback, fixing errors, suggesting changes.
- The firms using DCALC have been loyal. They have stuck with it.
- DCALC is ideal for training new engineers.
- DCALC has a wide range of useful applications, many unique in the industry
- DCALC is extremely fast and productive
- Most importantly, DCALC is not a "black-box". It produces calculations that structural engineers can follow.

However, due to the emergence of the Internet, harmful programs have become a part of our lives. As Windows operating systems have evolved, security measures have been introduced which complicate DCALC's installation process. Unfortunately – like many older "legacy" software applications - DCALC has been falsely tagged as "malicious".

As "a one-man operation", it has been difficult for me to respond to these AV issues. After much consideration, I am writing this chapter, offering a hassle-free way to run DCALC now and in the future.

(* DesignCalcs, Inc. https://www.designcalcs.com)

15.3 Options for Running DCALC When Plagued With Anti-Virus Warnings:

For users plagued with anti-virus software warnings when they run DCALC, I recommend the following three options:

1. Work with their network administrators to place DCALC executables on an anti-virus software "safelist", allowing DCALC to run.
2. Install DCALC on an old Windows XP computer (without AV software)
3. Install DCALC on a "virtual machine" running Windows XP.

This last option is discussed in this chapter.

15.4 Introducing Virtual Machines

- Oracle's VirtualBox application is a free program, which allows users to install a "virtual computer" on their computer.
  Essentially, the virtual computer runs independently within the host environment.
- The user sees and runs the virtual computer, as though they are running a different computer.
- Files are easily shared/transferred between the virtual computer and the host computer
- The host computer is protected from the virtual computer

A virtual machine can easily be installed using Oracle's VirtualBox

- This type of installation must be done machine-by-machine
- The user simply installs Oracle's Virtualbox, then imports a virtual machine from DesignCalcs. This machine is pre-built with DCALC, ready to go.
- By default, calculations are stored on the "C:" drive of the virtual machine
- By default, files are shared with the host computer on the "C:\Shared" drive of the host machine.
- Users have the ability to share as much of their host machine and network with the virtual machine as they desire.
- PDF files of the calculation are easily shared/transferred from the virtual machine to the host

15.5 Steps for Installing DCALC on Oracle's Virtual Box

The installation process involves the following steps:

Step 1: Install Oracle's Virtual Box
Step 2: Download and Import a Pre-Built DCALC Virtual Machine
Step 3: Activate DCALC

Users now have the option to install DCALC with a perpetual license.

STEP 1: Installing Oracle's Virtual Box

To download Virtual Box, go to https://www.virtualbox.org/wiki/Downloads

You will see the following screen:

Click on "Virtual 6.0 builds", which will take you to this screen:

Click on "Windows hosts". The file will download.

After the file downloads, install the program.

STEP 2: Download and Import a Pre-Built DCALC Virtual Machine

Before installing the virtual machine, using File Explorer make a directory on the HOST computer called "C:\Shared".

Use the link provided by DesignCalcs for downloading the virtual machine file.

Download the virtual machine file.

Open Virtual Box

Click "Tools" on the upper left

Click "Import"

Browse for the downloaded file, "DCALC Computer With Windows XP" and accept.

STEP 3: Activate DCALC

Open Virtual Box

Click on "Start"

Find the DCALC icon on the desktop and start.

Enter the activation data provided to you.

DCALC will initially begin in the demo directory. You will want to first setup some project directories.

On the DCALC Menu, Click "Enter Job Directory" and setup a directory on the virtural machines "C:" or, preferably, the "H:" drive (the shared drive).

The Virtual Machine "H:" drive is mapped to the HOST computer "C:\Shared" Drive.

If you run into difficulty sharing drives, referred below to page 15-9, "SETTING UP SHARED DRIVES".

You can control how many drives are shared with the Virtual Machine.

Final Thoughts:
Why use a virtual machine for DCALC?

- A virtual machine is isolated from a host computer, which should satisfy any security concerns
- DCALC simply runs better on Windows XP, with none of the hassles associated with later Windows operating systems. There is no need to set such things as privileges.
- The installation of a virtual machine is relatively easy, using the "import" capability.
- A virtual machine is fast and easy to use.
- Using this setup, a virtual machine can operated on all future operating systems, whether it's Windows 11, 12,…20…30 – as long as the host computer has Oracle VirtualBox installed.

Remember to always power-off your virtual machine, then exit out of virtual box when you are finished for the day. Realize that a virtual machine is simply a file, not an actual computer. We turn it on and off, just like a physical computer. But there is the potential this file could accidently be deleted.

You can easily adjust the size of your virtual machine's screen, using the "View" control. In fact, DCALC may appear even more legible on the virtual machine than the host, since it was originally designed for lower operating systems, such as Windows XP.

Good luck!

- KJH, November 20, 2020

APPENDIX: DETAILED INSTRUCTIONS FOR SETTING UP VIRTUAL MACHINES

The foregoing instructions explained the "easy way" to create a virtual machine. For those who want to understand the step-by-step process of installation, the following is included.

ALTERNATE STEP 1: Install Oracle's Virtual Box
(See previous STEP 1 instructions)

ALTERNATE STEP 2: Download Windows XP ISO File

To download, go to https://archive.org/details/WinXPProSP3x86

You will see this portion of the screen:

I.6.3

Click on "ISO IMAGE" (Note: An "ISO" image is a file that is on an optical disk drive.)

This file is over 570 MB and will take some time to download.

Make a directory to store this iso file. On my computer's "C:" drive, I made the following directory where I placed the file: C:\WindowsXP\ISO File

Place the ISO file in this diretory.

For this particular Windows XP file, the product key is,
M6TF9-8XQ2M-YQK9F-7TBB2-XGG88

You will need this key later in the installation process.

ALTERNATE STEP 3: Install Windows XP on Virtual Box

Open Virtual Box

Click “New” Button

A dialog box opens:

- Under “Name”, enter Windows XP
- Under Windows drop-down menu, select Window XP 32 bit.
- Under “Memory Size”, slide scale to 512 MB
- Under hard disk, select “Create a virtual hard disk now”.
- Click on “create”.

Another dialog box saying “Create A Virtual Hard Disk”

- Select 10 GB
- Under “Hard Disk File Type”, select “VDI”
- Under “Storage on Physical Hard Drive”, select “Dynamically sllocated”
- Click on “create”

The dialog boxes will close.

You will see the virtual machine has been created (but it does not yet have the operating system installed)

Click the “Start” button.

The Virtual Machine starts, and the first thing it asks is “Select a startup disk”.

Click on the folder icon. Browse for the ISO file, which is saved on C:\Windows XP\ISO File.

Click on “Open”.

Click on “Start”.

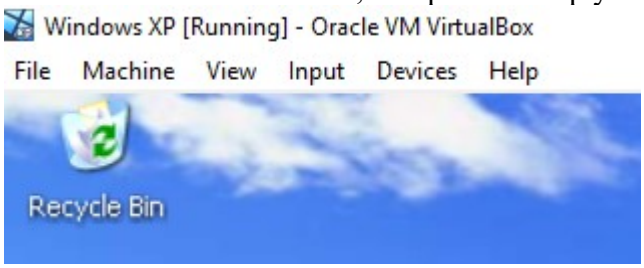
This starts the Windows XP installation setup:

- You will see “Unpartitioned space” highlighted. Hit enter.
- Next screen, using the arrow keys, select “Format the partition using the NTFS file system (quick)”
- The virtual machines hard disk (actually a file on the host computer) will be formatted
- After copy the setup files, the virtual machine will restart. Don’t press any key.
- Windows XP will install (may take roughly 30 minutes). Make sure you are there to answer questions when prompted.
    - First pop-up asks language. After selecting English, click “Next”

    - Another box appears, titled “Personalize Your Software”. Enter your name and organization. Click “Next”.
    - Another box appears, titled “Computer Name and Administrator Password”. (you can leave password blank, if you choose). Enter the information. Click “Next”.
    - Another box appears, “Date and Time Settings”. Adjust accordingly. Click “Next”.
- The installation process continues.
- A pop-up appears: “Workgroup and Computer Domain”.
    - Select “No – this computer is not on a network.”
    - Enter a name in the box (such as “workgroup”)
    - Click “Next”.
- The installation process continues.
- The virtual machine restarts. Make sure not to press any key when it restarts.
- The Window XP logo appears.
- Screen resolutions are adjusted. Click “OK”, then “OK” again.
- You will see a welcome screen and hear background music.
- When asked “Will this computer connect the Internet directly or through a network?”, select “Yes, this computer will connect through a local area network or home network”. Click “Next”.
- You will see a screen, “Ready to register with Microsoft?” Click “No”.
- You will see a screen, “Who will use this computer?”. Enter user’s name in the top line. Click “Next”. Then “Finish”.
- You will see “Welcome”.
- The desktop will be shown.
- You will need to make a desktop icon for Windows Explorer:
    - Click “Start” button at lower left
    - Click “All Programs”
    - Click “Accessories”
    - Find “Windows Explorer”, Right Click and “Send to Desktop”.

SETTING UP SHARED DRIVES:

- ON VIRTUAL MACHINE, at top of desktop you will see this ribbon:



  - Select Devices
  - Click on "Install Virtual Box Guest Additions"
  - After installation, virtual machine will restart.
- On the virtual machine's desktop, open Windows Explorer.
- Find "Virtual Box Guest Additions (D)″ and click on it.
- An installer comes up. Go through the installation process.
- It will ask you to reboot the virtual machine.
- GO TO HOST MACHINE (not the virtual machine). Using File Explorer, create a folder where you will be sharing/transferring files. For the purposes of these instructions, a folder "C:\Shared" has been created.
- GO BACK TO VIRTUAL MACHINE.
- On top ribbon, select "devices", "shared folders", "shared folder settings".
- A pop-up appears.
  - Click "Folder path". This will send you to the host computer. Find "C:\Shared".
  - Do not check "Read only"
  - Leave "Mount Point" blank
  - Check "Make Permanent"
  - Click "OK".
- Now your host folder is shared with your virtual machine. Select "OK".
- Click the Start button -> My Computer -> My Network Places
- A Wizard pops-up
  - Click "Next"
  - You will browse for the folder "Shared"
  - Select it. Then "Next", then "Next" again. Then "Finish".
  - By default, it will open the shared folder.

At this point, you will have a virtual Windows XP machine with a shared drive with the host computer. From here on, the virtual machine will boot-up very quickly.

ALTERNATE STEP 4: Install DCALC on the Virtual Machine.

- On the HOST COMPUTER, download DCALC_NET_INSTALL.EXE and DCALC_UPDATE.EXE from the DesignCalcs website
- Copy these files to C:\Shared
- On the VIRTUAL COMPUTER
    - open Windows Explorer and copy these two files to the virtual computer's C: drive in a folder.,
    - Click on DCALC_NET_INSTALL.EXE. Go through the installation process.
    - Click on DCALC_UPDATE.EXE.
        - For location to unzip to, browse to C:\Program Files\DCALC
    - Click "Unzip"
    - Open Windows Explorer
    - Find C:\Program Files\DCALC\DCALC.exe Right click and make this a desktop icon.
    - Close Windows Explorer
    - Click on the DCALC icon.
    - Choose "Activation"
    - Enter the activation data provided to you.
    - DCALC will initially begin in the demo directory. You will want to first setup some project directories. On the DCALC Menu, Click "Enter Job Directory" and setup a directory on the C: drive.

(Always remember to "power off" your virtual computer when you are finished.)

ALTERNATE STEP 5: Install a PDF printer on the Virtual Box Computer

You will need to find a PDF printer that is compatible with Windows XP. I installed a free printer called PDF4U, which is available at http://www.pdfpdf.com

To install a printer software:

- On the HOST COMPUTER:
    - Download the software
    - Save the files to the C:\Shared drive
- On the VIRTUAL COMPUTER:
    - Open Windows Explorer and transfer the files to the C: drive
    - Install the software.

When you need to printer a file in DCALC from the virtual machine, it will print by default to the printer installed.

You will transfer the printed PDF calculations back to the HOST computer's C:\Shared drive.