CYBERPATRIOT

NATIONAL YOUTH CYBER EDUCACTION PROGRAM

SOFTWARE & VIRTUAL MACHINE (IMAGE) DOWNLOAD INSTRUCTIONS

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Software & Virtual Machine (Image) Download Checklist

Please read following checklist and detailed instructions carefully and completely before opening any demo or competition images. To mitigate technical issues, it is important that these steps are followed in sequential order.

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3. Virtual Machine (Image) Download

- ☐ **Download the Images** – Use the links provided in the camp-specific demo/competition image download email.
- ☐ **Verify the Image Checksums** –Checksums may be found in the camp-specific demo/competition image download email.
- ☐ **Verify the Host System Time** – The host system time (clock) must be correct.
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- ☐ **Download Packet Tracer Files –** These files are included in the PT Files.zip folder (the same folder that contains the Packet Tracer executable file).

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- ☐ Troubleshooting for Malfunctioning Image

Host Machine Setup

We recommend your "host" system (your physical computer) has these specifications:

- 64-bit i3 processor of the generation "Sandy Bridge" or better OR AMD 64-bit processor of the generation "Bulldozer" or better (built in 2011 or later)
- **Virtualization Technology / Extensions (e.g., VT-x, Vx) must be ENABLED in the BIOS**
- 8 GB of RAM (4 GB may cause performance issues)
- 40 GB of free disk space
- XGA (1024x768) or higher display / 1280x1024 recommended

For more detailed information, view the full technical specifications.

Enable Virtual Technology on the host computer BIOS if it is disabled
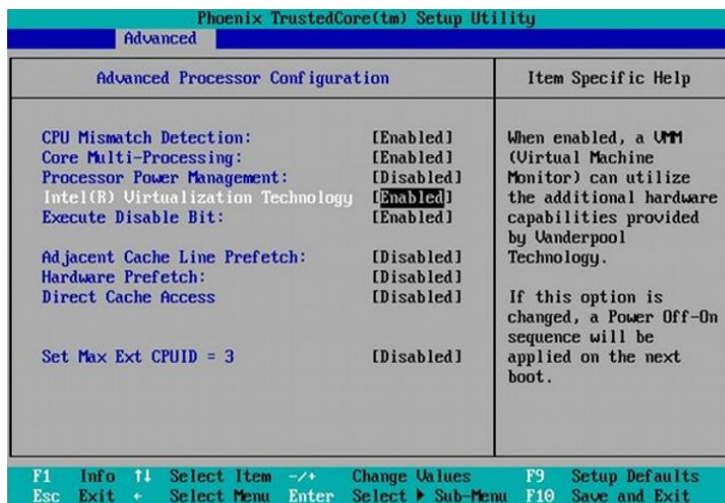
Check with your computer manufacturer for the exact steps to change the BIOS. Normally, the BIOS can only be accessed in the few seconds of black or blue screen that appears at the beginning of the boot-up or re-starting process. A note to press a key such as Esc or F1 is to enter **Setup** or the **BIOS** is normally shown at the bottom of the screen. It may take several attempts because it is a short period of time before the Windows screen appears. Below is a screen capture of a BIOS screen with Virtual Technology enabled.
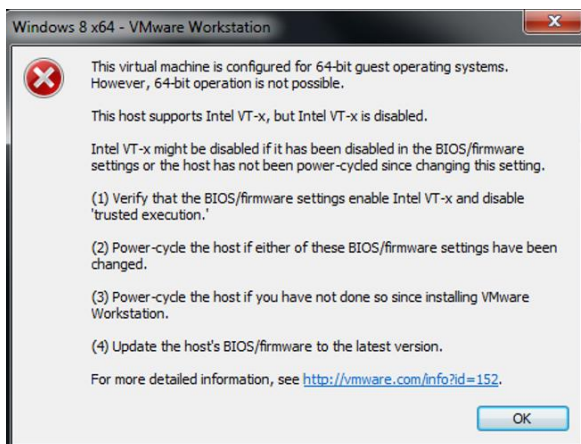
You will receive an error in VMware Workstation Player if your Virtual Technology is disabled, as shown in the screenshot to the left.

Ensure Internet Connectivity

Your image MUST be connected to the Internet, which means your host machine should have a stable internet connection.

Software Installation Instructions

To successfully open the virtual demo and competition images, 7-zip, WinMD5, and VMware Workstation Player (15.1.0) software must be installed on your host machine:

7-Zip Download and Installation

7-Zip – This software will extract the virtual machine images after they are downloaded (images are compressed in .zip format when downloaded) – Click here for 7-Zip installation instructions with screenshots

1. Go to https://www.7-zip.org/. Download the 64-bit x64 version (CyberPatriot requires using a 64-bit host). If prompted, choose to "Save" the file to disk.
2. Locate the 7-zip installation file (by default, it will typically be saved to the Downloads folder). Double-click to install.
3. When prompted, click "Yes" to allow the installation to proceed.
4. Click "Install" to continue.
5. Click "Close" to finish the installation.
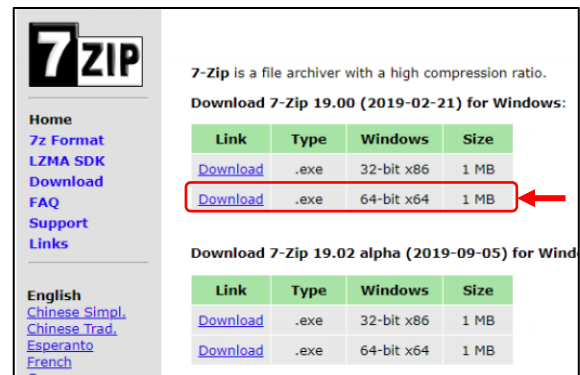
WinMD5 Download and Extraction

WinMD5 – This software verifies that your images were not corrupted during the download process by using a checksum. If the checksum of your downloaded image does not match the checksum provided in the image download email, you will need to re-download the image. – Click here for WinMD5 installation instructions with screenshots

1. Go to http://www.winmd5.com. Click "WinMD5 Freeware Download." If prompted, choose to "Save" the file to disk. (Note: You must have 7-Zip installed to decompress the installation file)
2. Locate the WinMD5 installation file (by default, it will typically be saved to the Downloads folder).
3. Use 7-Zip to extract the contents of the WinMD5 file (right-click the WinMD5 file folder, hover over 7-Zip, and select "Extract Here" to extract to the current folder OR select "Extract files…" if you want to extract the contents to a different folder).
4. Run WinMD5 by double-clicking on the extracted application file.

VMware Workstation Player 15.1.0 Download and Installation

VMware Workstation Player 15.1.0 – The CyberPatriot demo and competition images are run in VMware Workstation Player. Other virtualization software may work, but technical support is only provided for the VMware program version listed above. VMware Fusion or newer versions of VMware Workstation Player may be used, but at the risk of incurring technical issues. – Click here for VMWare Workstation Player installation instructions with screenshots

1. [Click here to download the VMware Workstation Player 15.1.0 installer](#). Select the Major and Minor Versions to reflect 15.1.0 and click on the "Download" button for Windows 64-bit Operating Systems.

2. Locate the VMware-player-15.1.0-13591040.exe installer (by default, it will typically be saved to the Downloads folder).

3. Double-click on the VMware-player-15.1.0-13591040.exe and select "Yes". The installer application will open.

4. Click "Next"

5. Check the box to accept the License Agreement and click "Next."

6. Click "Next" on the Custom Setup window

7. **Uncheck** the two boxes ('*Check for product updates'* and '*Join the VMware Customer Experience')* and click "Next."

8. Click "Next" on the Shortcuts window.

9. Click "Install."

10. Once the installation is complete, click "Finish."

Packet Tracer 7.2.2. Download and Installation

[Packet Tracer 7.2.2](#) – Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface. It is required for the Cisco Portion of the camp curriculum.

1. [Click here to download the *PT Files.zip* folder](#). Note: In addition to the Packet Tracer software, this zipped folder contains the required Packet Tracer files that will be used during the the Cisco portion of this camp.

2. Extract the contents of the zipped folder.

3. Double-click on the PacketTracer-7.2.2-win64-setup application file and select "Yes." The installer application will open.

4. Check the box to accept the License Agreement and click "Next."

5. Click "Next" as you go through the prompts.

6. Click "Install"

7. Once the installation is complete, click "Finish."
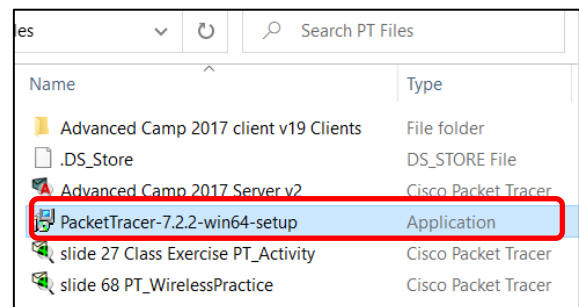
Virtual Machine (Image) Download Instructions

Step 1: Download the Virtual Machine (Image)

1. **Use the links provided** in your camp-specific email to download the images. Demo image download links are typically sent three weeks prior to the camp start date. Competition image links are typically sent one week prior to competition date.

   NOTE: The image files are large and may take several hours to download. It is recommended that you download the image file(s) as far in advance as possible.

Step 2: Verify the Checksum

1. Open WinMD5 by double-clicking the application file.
2. Click "Browse" and select the .zip file you would like to verify the checksum of. (You should be selecting the zipped image file downloaded in the previous section.
3. The checksum calculation process will begin immediately. After the green loading bar is complete, the file's MD5 checksum will be displayed under "Current file MD5 checksum value:"
4. Copy and paste the original file MD5 checksum value in the bottom box. The original file checksum is provided in the image download email (the same email with the image download links).
5. Click "Verify"
6. If the checksum matches, the image has downloaded successfully. If the checksum does not match, the image download file is corrupt and must be redownloaded.
7. Click "OK" and exit WinMD5.
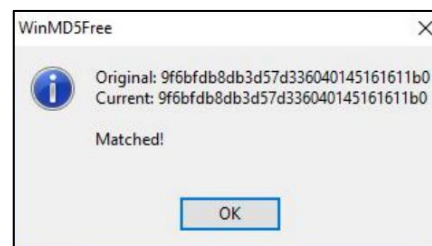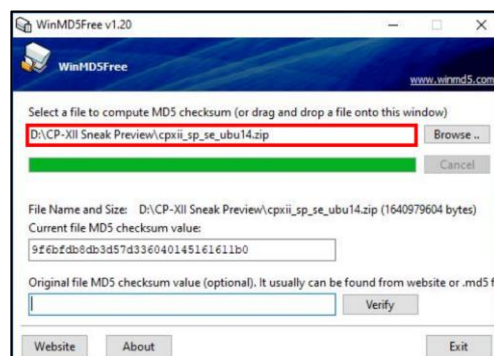
Step 3: Unzip the Image

You must use the 7-Zip software to extract the image file:

1. Right-click the zipped image download file.
2. Select "7-Zip" then select "Extract here." NOTE: *DO NOT modify, delete, copy, or move any of the files in the folders created during extraction.*
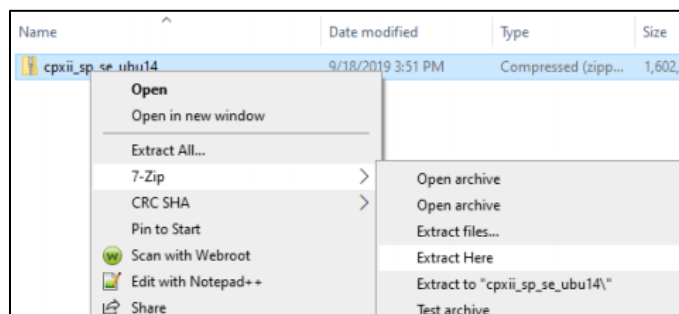
3. Enter the extraction password exactly as provided by the CyberPatriot Program Office.

NOTE: Passwords for demo images are included in the demo image download email. Passwords for competition images are sent in a separate email prior to the competition start time.

NOTE: The extraction process may take a minute or two. If it is finished in only a few seconds, the password may have been incorrectly entered and the extracted file folder will need to be deleted and re-extracted.
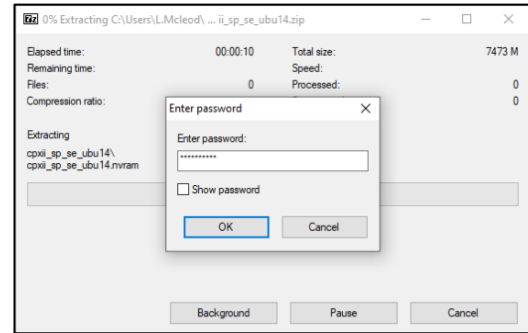
Step 4: Packet Tracer File Download

These files are included in the *PT Files.zip* folder that contains the Packet Tracer executable file.

The following files must be available on instructor computers:
  – Advanced Camp 2017 Server v2 (.pka - Cisco Packet Tracer File)

The following files must be available on student computers (also recommended for instructor computers):
  – Advanced Camp 2017 client v19 Clients (.pka)
  – Class Exercise PT_Activity.pkt
  – PT_WirelessPractice.pkt

Opening a Virtual Machine (Image)

Once the image file has been extracted from the original zipped download file, it can be opened in VMWare Workstation Player – Click here for step-by-step instructions with screenshots

NOTE: *If opening a competition image, DO NOT open the image in VMware Workstation Player until you are ready to compete. Opening an image early will corrupt the scoring.*

1. Open VMware Workstation Player by double-clicking the application file or desktop shortcut.
2. Select "Open a Virtual Machine" from the main menu.
3. Find and select the unzipped image file folder. Click "Open."
4. Select the extracted image file and click "Open." (look for VMware virtual machine configuration [.vmx] file type)
5. Click "Play Virtual Machine"
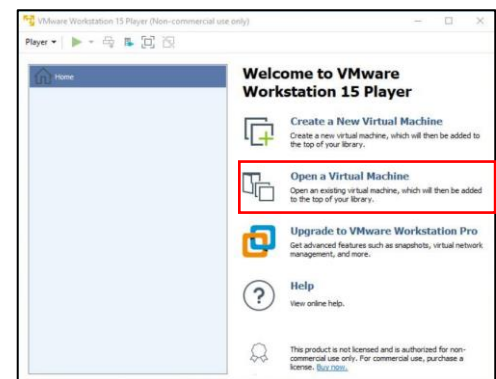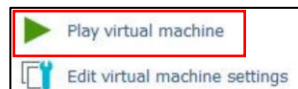
NOTE: When you launch an image, you may see a pop-up asking if you moved or copied the image – always click on "I Copied It." If you are prompted with pop-ups regarding removable devices, click "OK." If you are asked about software updates, click "Remind me later."

(If opening a competition image, continue with steps 6-11. Additional details on steps 9 & 10 are explained in the next sections)

6. Read and agree to the CyberPatriot Competition Agreement. Check box and click "Continue."
7. Enter Unique Identifier – See details below:
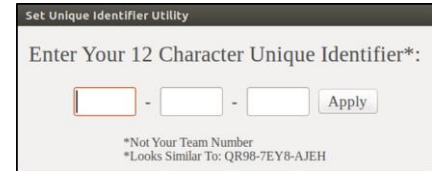
    - Your Unique Identifier (UID) is 12-character "code" (i.e., ABCD-1234-XXXX). It must be entered immediately to receive scoring feedback and ensure your scores are recorded correctly. When you first start an image, a box will prompt you for your Unique Identifier (pictured to the right).
      NOTE: AFA CyberCamp UIDs are provided to camp coordinators in an excel file that is uploaded to the coordinator dashboard. Camp coordinators or instructors are responsible for assigning individual UIDs to competing teams. Assign only one (1) UID per team. If students are competing independently, assign one (1) UID per student.
    - When you start the image, the desktop may be obscured, leaving only the CyberPatriot Set Unique Identifier utility. If the Set Unique Identifier box does not appear after the Competitors Agreement, double-click the Set Unique Identifier icon on the desktop.
      o Click "Yes" to start the Set Unique Identifier utility and enter your Unique Identifier.
      o Click "Apply" and "OK."
      o When you have entered it correctly, you will receive a message indicating that it has been saved. If you receive a message that your Unique Identifier is invalid, verify and re-enter it.

8. Read the ReadMe File - The README file contains a brief description of the scenario for that image and provides a few hints to help you get started finding and fixing vulnerabilities. It will also contain any account passwords necessary for the image.

9. Find and Fix Vulnerabilities

10. Check your progress on the Scoring Report

11. **Shut down the image once you are done competing.** Scoring and time will stop when the image is closed. You may click the CyberPatriot Stop Scoring icon on the desktop or alternatively, use the standard shutdown procedure to close an operating system.

Finding and Fixing Vulnerabilities

Once you have read the ReadMe file, you can start finding and fixing vulnerabilities (and answering forensic questions) to earn points. Your team can increase its score during the camp in two ways:

First, you can find and fix the problems and misconfigurations on an image. While not all the issues are scored, the README may point you in the right direction.

Second, you can score points by answering questions about image problems. Questions can be answered in the "Scored Questions" or "Forensics Questions" file(s) on the desktop. Spelling counts!

Understanding the Scoring Report

In the competition images, your Scoring Report provides information about the status of your system and your progress in fixing vulnerabilities. **To view your report, click the "CyberPatriot Scoring Report" shortcut on the image desktop.**

CyberCamp Windows 10 Competition Image

Report Generated At: 2021/04/21 2:30:00 UTC

Approximate Image Running Time: 0:01:01

Approximate Team Running Time: 0:01:01

Current Team ID: XXXX-XXXX-XXXX

0 out of 100 points received

Click here to view the public scoreboard

Connection Status: Scoring Data Uploaded Successfully: No Errors Detected

Internet Connectivity Check: OK
CCS Server Connection Status: OK
CCS Server Score Upload Status: OK

0 penalties assessed, for a loss of 0 points:

0 out of 22 scored security issues fixed, for a gain of 0 points:

The Scoring Report page can take 1-2 minutes to update after the first time the image is started. After that, It will update approximately every minute.

NOTE: If it does not appear to refresh for a few minutes, press Ctrl + R to refresh the report.

Virtual Machine (Image) Time

Report Generated At: At the top of the page you see the words "Report Generated At" followed by a date/time stamp. This time is expressed in Coordinated Universal Time (UTC).

If this time has not changed for at least 10 minutes, refresh the page. If it still does not change, reboot your image. Tampering with the CCS Client service will stop local scoring feedback. If the local scoring client has been disrupted, stopped, or tampered with, you may a warning message (pictured)

Report Generated At: 2018/10/24 20:44:03 UTC

WARNING: CCS Scoring service may not be running

Approximate Image Running Time: 01:51:55

Rebooting your image should fix this issue. In the event the scoring client has been removed from the image or stopped, please see the "Frozen Image" instructions under the **Malfunctioning Image** section below. If your team opens a new copy of the image, the score for the image will be reverted to **zero**.

NOTE**:** JavaScript is required for this error message to appear correctly. To ensure that you only receive correct error messages, do not disable JavaScript.

Approximate Image Running Time: This refers to the time elapsed since the initial opening of the image by pushing play in VMware Workstation Player. Note that the image time is started when the image is opened, not when the Unique Identifier (UID) is entered.

Approximate Team Running Time: This refers to the time elapsed since the team opened the first image (if working on more than one image). For example, If Windows 10 was opened before Ubuntu 16, the Team Running Time starts when the Windows 10 image was opened.

Connection Status

This section of the Scoring Report informs you of your image's network connection status.

If you see "No Errors Detected" then you have no problems connecting to our server and scoring should function properly (pictures to the right).

Connection Status: Scoring Data Uploaded Successfully: No Errors Detected

Internet Connectivity Check: OK
CyberPatriot Connection Status: OK
CyberPatriot Score Upload Status: OK

If there is an error, then one or more of the following checks are failing (and will be highlighted in red). In most cases, these problems can only be fixed by talking to your IT administrator.
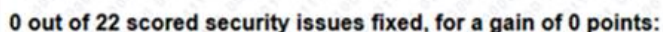
- Internet Connectivity Check: Checks an image's ability to connect to Google. If it fails, there is a problem with the image's connection or something on the network is blocking access.
- CyberPatriot Scoring Server Connection Status: Checks an image's ability to connect to the scoring server. If it fails, you will need to troubleshoot your network connection.
- CyberPatriot Score Upload Status: This checks an image's ability to upload scoring data to the scoring server. A failure is usually the result of a proxy server or other security measure.

IMPORTANT: The image will score properly if you maintain a network connection to the Internet.

Points and Penalties

0 penalties assessed, for a loss of 0 points:

0 out of 22 scored security issues fixed, for a gain of 0 points:

Points are earned when you find a fix a scored vulnerability. Some scored vulnerabilities are worth more points than others. Penalties are incurred when a critical service stops functioning or a previously remediated vulnerability is reintroduced.

The bottom section of the Scoring Report contains a list of scored vulnerabilities and possible penalties found in the image. This section informs you of how many issues are being scored and notifies you when an issue that is being scored has been addressed. The scoring system will also assess penalties, which can result from actions that run contrary to the scenario outlined in the README file. Points lost due to penalties can be regained by correcting whatever action caused them to be assessed.

CCS Notification
You Gained Points
Notify.exe

When scores change in either direction, teams will be notified with both a sound and a visual cue (left). These will only be played when a scoring report is generated, which is roughly every minute.

Troubleshooting for Malfunctioning Image

Image Will Not Open

If an image that has a correct MD5 checksum does not open, you may try the following:

- Verify the file name at the top of the VMware Workstation Player is correct.
- Verify that the file is not a zipped file by opening the unzipped image from the VMware Workstation Player. This is a common error.
- Ensure virtual extensions or Virtual Technology settings are enabled in the BIOS.
- Remove and re-install VMware Workstation Player.
- Open the image on a different computer.

Frozen Image

If an image appears frozen, does not score, or otherwise does not function properly, the user has three options:

- Go back through your notes and reverse what may have caused the issue.
- Stop working on the image and accept the current score.
- Shutdown the image, remove it from the library in VMware Workstation Player as well as the unzipped copy from the folder it was in, and reboot the host computer. Then unzip a new image, open the image in VMware Workstation Player, and start with a score of zero.

Shutdown and Stop Scoring Button Issues

There are certain image security settings that will cause the *Stop Scoring Button* to malfunction. In the event your team receives an error using the *Stop Scoring Button*, please shut down the image using the following steps below:

1. Click the **Player** drop-down
2. Click **Power**
3. Click **Shut Down Guest**
4. Click **"Yes" on the pop-up**

Shutdown or restart the host computer and **do not** re-open the image or you may incur an overtime penalty. Please ensure the images are deleted at the end of each camp.

Restart a Virtual Machine (Image)

If an image needs to be restarted (restored to the way it was before any changes were made):

- Shut down image in VMware Workstation Player
- Delete the image .vxm folder (the current version of the unzipped image folder)
- Extract a new copy of the image from the .zip file (the original image file download)

NOTE: If you open a new copy of the image, the score for the image will be reverted to zero. It is important to keep notes of changes that have been made to easily and quickly earn back the lost points.

For additional technical support,
email cpoc@uscyberpatriot.org or call 877-885-5716