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Guide to Running the ICPC Contest Image on MacBook Pro M-Series

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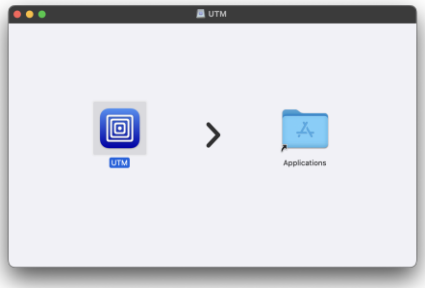
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The ICPC Contest image is designed to run on the x86-64 architecture only (Most PC's and Laptops). It will **not** run natively on a MacBook Pro M-series (Apple Silicon). The only way to run the contest image on the MacBook Pro is to run it in a Virtual Machine (VM). The virtual machine will emulate the x86-64 hardware by interpreting the binary machine code. As a result, performance will not be stellar, but in most cases it's usable (M2, M3, M4. On the M1 - it may be too slow). There are a few VM options you can use to run the ICPC contest image. We currently only support the first one, UTM, and this document will guide you through the setup process. Here are the choices for a Virtual Machine environment:

1) UTM is an open-source virtual machine application for macOS and iOS (see Wiki). There are lots of on-line resources to help you if you get stuck.
2) Broadcom offers their VMWare free of charge for personal and educational use: https://knowledge.broadcom.com/external/article/368667/download-and-license-vmware-desktop-hype.html This one has been verified to work with the contest image, and it appears to run a bit faster than UTM. We can not offer support for VMWare.
3) VirtualBox - https://www.virtualbox.org/ is rumored to work too, but we have not tested it and can not offer support for it. If you choose to use VirtualBox, and get it working, please let us know!

Running the ICPC Contest Image on a MacBook Pro M-series

1) Download and install UTM for your Mac
   a) Go to mac.getutm.app in Chrome
   b) Press the **Download** button. If the UTM app does not start, then manually double click on the desktop icon.
   c) Drag the **UTM** icon to the **Applications** icon in the pop-up window



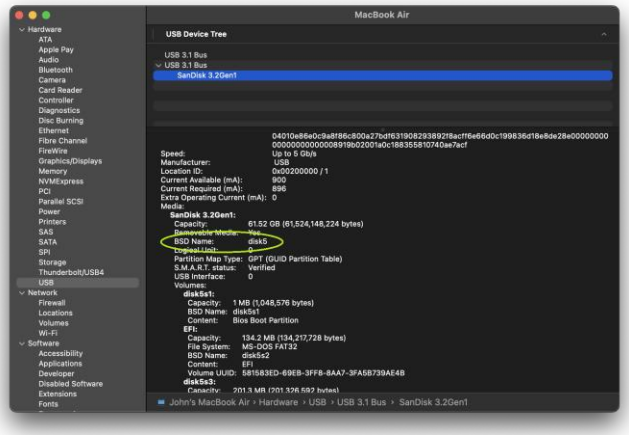
   d) Close the UTM window above. **UTM** is now in your **Applications** folder.
   e) Double-click the **UTM** icon in the **Applications** folder (NOT the one on the desktop!)
   f) A warning will pop-up about running an application downloaded from the internet. Click the **Open** button.
   g) Skip the "What's New" pop-up (Press the **Continue** button)
2) Get the contest image

a) If you already have a thumb-drive with the contest image on it, **skip this step**. On contest day, you may be given a thumb-drive with the contest image, so you will use the **b)** step below, not this method.
   i) Create a command prompt on your MacBook
   ii) Download the ICPC contest image using the following command (all on one line). Note that the link for the image may be different for **your** contest. See the image download page for your contest to obtain the correct image link. It will look similar as the one here:
   `curl -s https://image.icpc.global/gny2026pr/gny2026pr-2026-10-21_image-amd64.img.gz | gunzip > gnyimage.raw`
   iii) This will take a while depending on the speed of your internet connection. The file you are transferring is about 8GB in size, and it is being downloaded and uncompressed to a 30GB file. On a MacBook Pro M2, and a 300mbps download speed it takes about 8 minutes. When it's finished, confirm the created file (`gnyimage.raw`) is about 30GB in size. The following is just an example. The actual size and link name will be slightly different since we update the image from time to time – use the link provided about in step **`ii`**:

```
Mac:~ jbuck$ curl -s https://image.icpc.global/gny2025pr/gny2025pr-2025-10_image-amd64.img.gz | gunzip > gnyimage.raw
Mac:~ jbuck$ ls -l gnyimage.raw
-rw-r--r--  1 jbuck  staff  29884416000 Oct 16 09:34 gnyimage.raw
Mac:~ jbuck$
```

   iv) Skip the next step **b)** and go directly to **3)**

b) If you have a thumb-drive with the contest image on it, perform the following steps. On contest day, you may be given a thumb-drive with the contest image, and you can use the process in this step to install it on your MacBook Pro:
   i) Create a command prompt on your MacBook
   ii) Plug in the thumb-drive. A window may pop-up asking if you want to allow the accessory to connect. Press the **Allow** button.
   iii) Determine the name of the USB device you just plugged in.
      (1) Click on the Apple Menu icon in the upper left corner of your desktop
      (2) Hold down the **Option** key and click on *System Information* in the pop-up menu.
      (3) Under the *Hardware* node, select **USB**.
      (4) Look for the USB drive in the right pane. It may be something like: *SanDisk 3.2Gen1*.
      (5) Find the BSD Name entry. It will be something like "diskN" where N is a number.



      (6) At the command prompt, become super user: `sudo bash`
      (7) Enter your password if prompted.
      (8) Copy the contents of the USB drive to the image file (replace N with the number from the BSD Name above:

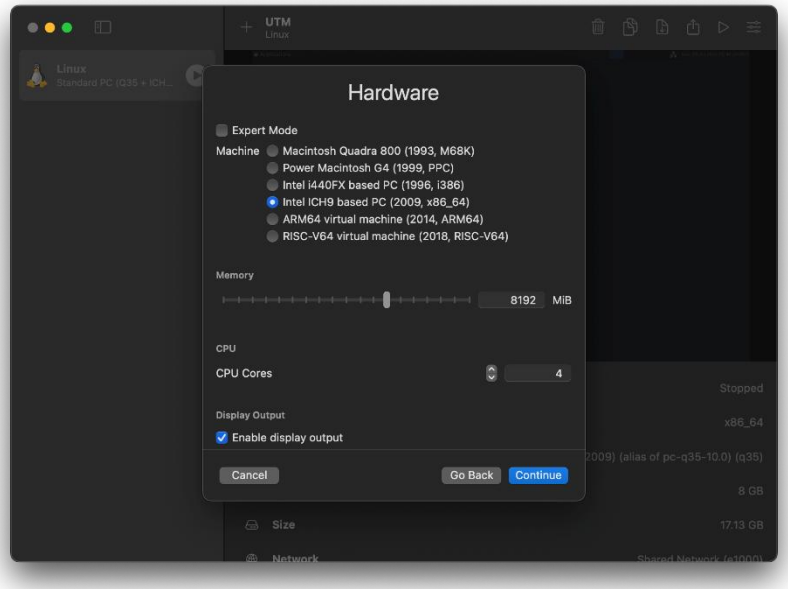
```
dd if=/dev/diskN of=gnyimage.raw bs=1M count=28500 status=progress
```

(9) That will take some time, depending on the speed of the thumb drive.

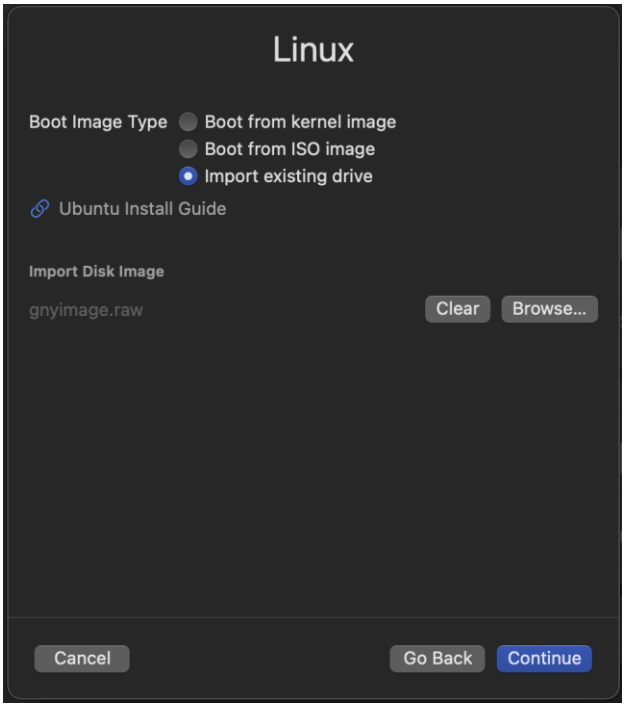
3) Now you have the contest image in a file called `gnyimage.raw`. We have to set up a UTM virtual machine to run the image.
   a) Go back to the *Welcome to UTM* window.
   b) Click on the **Create a New Virtual Machine** button (the one with the big + sign)



   c) Click on the **Emulate** button
   d) Click on the **Linux** button
   e) On the *Hardware* page, you have to make some decisions. If your MacBook Pro has a lot of RAM (16GB or more), you should change the *Memory* slider to be 8192MB instead of the default 4096MB. This will give the contest image 8GB of RAM (about half of what your system has)
   f) Set the “CPU Cores” to 4. If your MacBook Pro has more cores, you can increase this number to 6 or 8, etc. The more cores you use, the faster the contest image will run. 4 is a reasonable number on an M2, M3 or M4.
   g) Leave the other settings at their default values and press **Continue**



h) On the Linux page, select "*Import existing drive*" and **Browse…** to the location where the `gnyimage.raw` file is. Select the image. Press **Continue**.

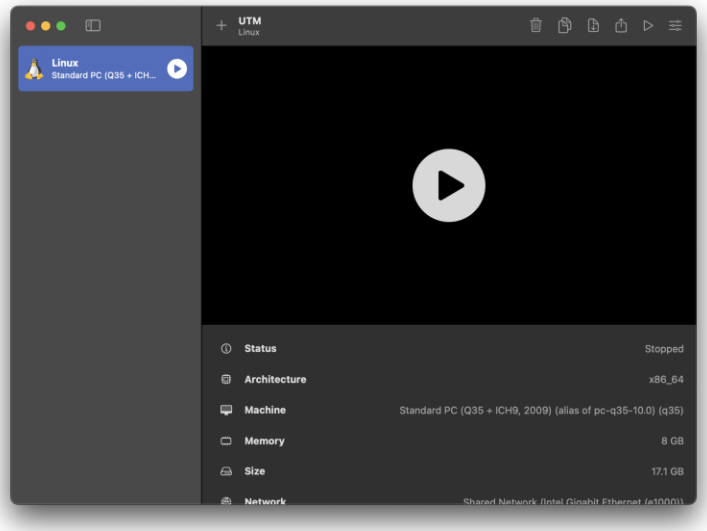


i) On the *Shared Directory* page, **DO NOT share any directories** - this will be considered cheating during the contest. The contest image can detect this, so don't do it. Just press **Continue**.

j) On the final *Summary* page, it may be prudent to make a screen capture in the event you have issues or need to re-create the Virtual Machine at some point. To take a screenshot of the window, press Shift-Command-4, then SPACE, then click in the *Summary* window. This will create a screenshot PNG file on your desktop.

k) Press the **Save** button. This will take a minute or so, depending on how fast your MacBook is.

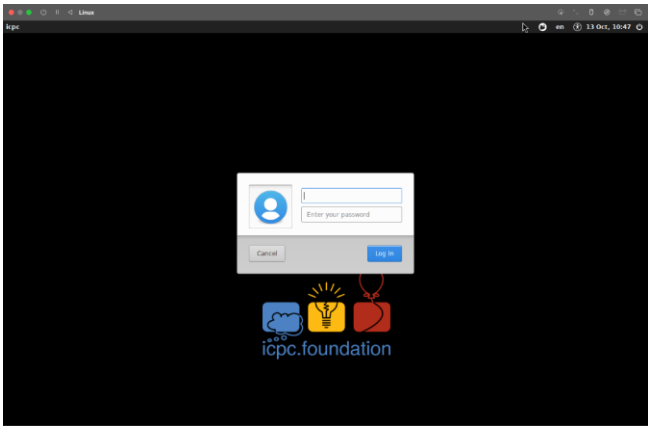
l) You should see the following window after it finishes saving:



m) Press the bit **Play** button (the arrow in the white circle).

n) The contest image will boot. You'll see a series of messages scroll by indicating that the system is booting in the Virtual Machine. Again, depending on which M-series MacBook Pro you have,

it can take some time. On a MacBook Pro M2, it takes about 2 minutes. The window will go completely black for about a minute or so. If it asks any questions about using your microphone, etc., answer Yes. Finally, you should see the ICPC login screen:



o) Press the green maximize button in the upper left corner to make the contest image use the full screen.
p) Log in using your team account and password. Again, this may take some time depending on the MacBook Pro you have. (20 seconds)
q) To shutdown the contest image, under the Applications menu, choose Logout, then click on Shut Down.