

Getting Ready for your Red Hat Remote Exam

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System Requirements

- ❑ **Computer:** You will need a computer with a single active monitor. Red Hat supports many Intel compatible X86_64-bit architecture computers.
- ❑ **USB:** One USB Drive (2.0 or higher) with at least 8 GB capacity.
NOTE: The entire disk will be overwritten, so make sure you have saved any contents you may have on the disk before following the procedure for creating the live exam environment.
- ❑ **USB Hub:** One wired USB hub is allowed if a hub is needed to accommodate permitted peripheral devices as described below.
- ❑ **Hard Drive:** A hard drive with free storage capacity of at least 4 GB (for Live USB creation only).
- ❑ **Mouse:** A wired mouse is optional but recommended. A wireless mouse is not allowed. A wired mouse is required if you use a laptop in a closed and docked mode as described below.
- ❑ **Keyboard:** Only one keyboard is allowed for the exam. If you wish to use an external, wired keyboard with your laptop, you will have to use the laptop closed and docked. This will require the use of an external monitor and wired mouse as well. Wireless keyboards are not permitted.
- ❑ **Webcam:** One external webcam with at least a 1m cable.
- ❑ **Monitors:** Only one physical display will be allowed for the exam.
- ❑ **Connecting an external monitor to a laptop:** You are only allowed to use one monitor, one keyboard and one external mouse. If you chose to connect an external monitor to your laptop, the laptop lid must be closed throughout the duration of the exam session. You will be required to use a wired keyboard and a wired mouse.
- ❑ **Sound and microphone:** A working microphone is required. Verify that the audio and microphone are not set on mute prior to the exam.
- ❑ **Operating system:** N/A.
- ❑ **Firewalls:** Firewalls that allow normal web activities will typically work. More restrictive firewalls that limit outgoing access and that require additional authentication may cause problems. Most firewall issues will show up when you run the compatibility test.
- ❑ **RAM:** Minimum 4GB of RAM are required.
- ❑ **Internet connection speed:** Download speed requirements are 768Kbps and upload speed requirements are 512Kbps.
- ❑ **Network connection:** Unless it is physically not possible, a wired network connection should be used, not wireless, to ensure the most reliable delivery of your exam.
- ❑ **Laptop battery:** If using a laptop, please ensure that the built-in battery is fully charged just in case there is an interruption of power. Do not rely on the battery as the principal power source.

- ❑ **Power:** We recommend the use of an uninterruptible power supply (UPS) for your computer, external monitor (if used) and networking equipment to maintain internet connectivity during power outages.

For a real time assessment of your network and hardware requirements, run the compatibility check within the Live Environment, which will be provided after the exam is scheduled.

Creating a Remote Exam Bootable Live USB

OS: Windows 10 Enterprise, Windows 8.1, Windows 7

**The display prompts and screens shown below might vary slightly depending on the version of Windows used.

- You will need a USB key with at least 8 GB storage, USB 2.0 or higher
 - Important: You need to be an administrator of the system. Obtain administrator privileges from your IT department if you are using a laptop provided by your organization. Use your personal laptop/computer to create a bootable USB If admin rights cannot be provided for security reasons.
1. **Download the Remote Exam Bootable Live USB** from [here](#) and save it in the local hard drive.
 2. **Connect the USB drive** intended for creation of Live USB
 3. **Go [here](#) to download** and install Fedora Media Writer

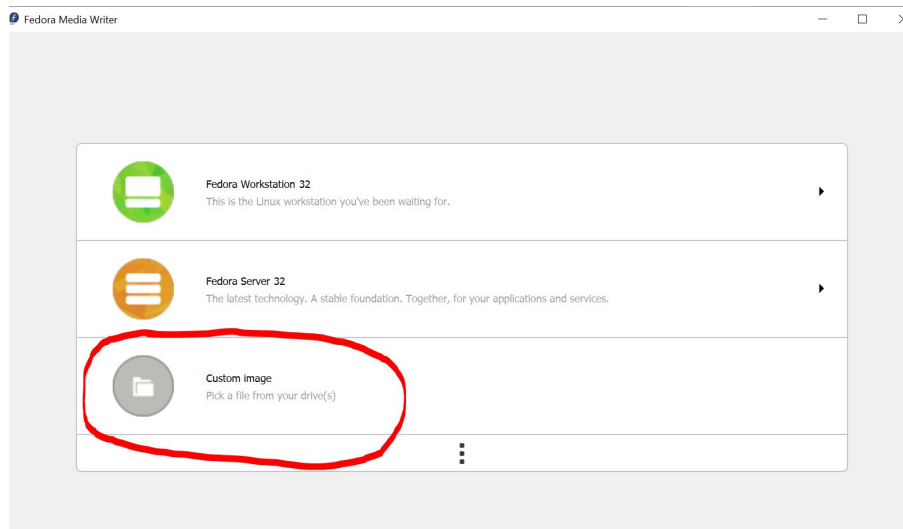
On Windows or MacOS?

Get started by using **Fedora Media Writer**, which makes it super easy to give Fedora a try.

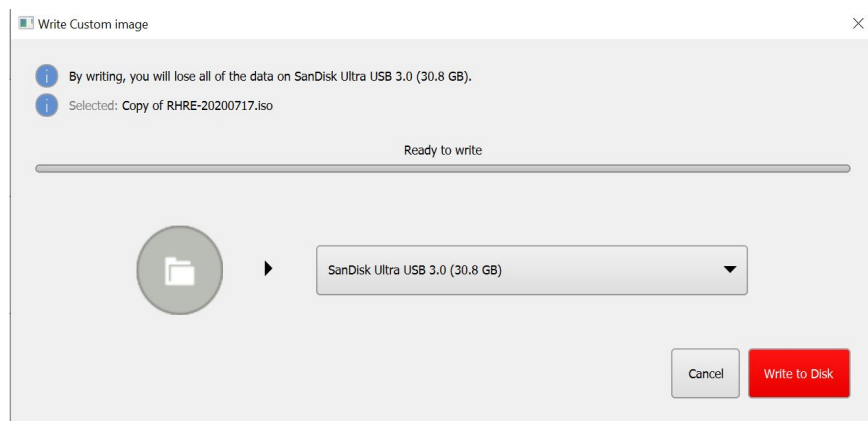
Fedora Media Writer



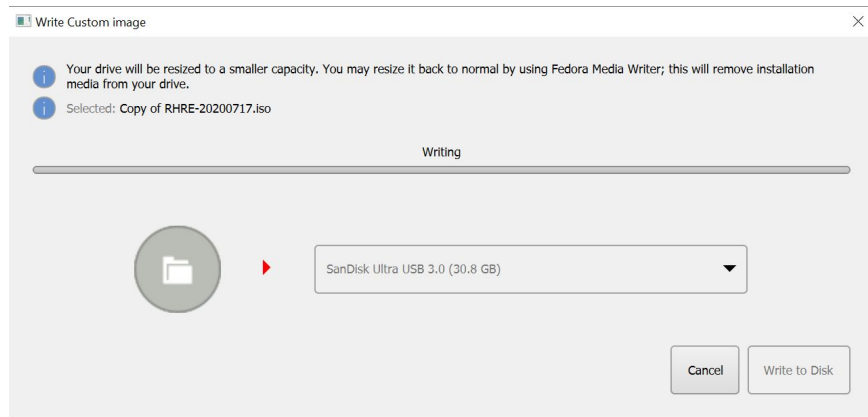
4. **Use the Fedora Media Writer** to write the downloaded .iso file to your USB drive.
 - a. Launch Fedora Media Writer from the list of installed programs
 - b. Select Custom Image



- c. Navigate to the bootable live usb image (.iso) stored in your computer, click on 'Open' and bring up the 'Write Custom Image' window



- d. If you have a USB drive connected to your computer, Fedora Media Writer will display that as the target device to create a bootable image. *Note:* Fedora Media Writer destroys all data on the USB stick while creating a Live USB media. We recommend you back up the contents of your USB drive beforehand
- e. Select 'Write To Disk' to initiate the Live USB creation process. The 'Write Custom Image' window should identify the connected USB drive



5. **Close the window** once the writing process is completed
6. **Boot to the Remote Exam Bootable Live USB** - [Go to instructions](#)

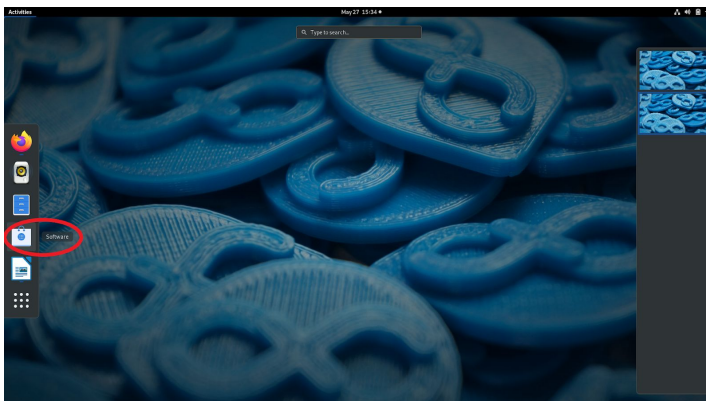
OS: Fedora 30.0 - Fedora 32.0

**The display prompts and screens shown below might vary slightly depending on the version of Fedora used.

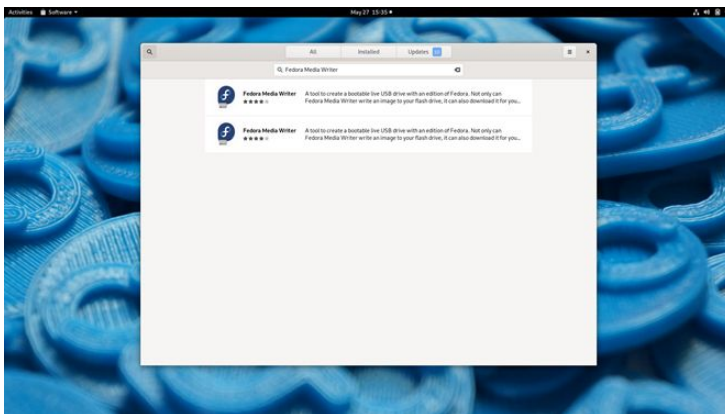
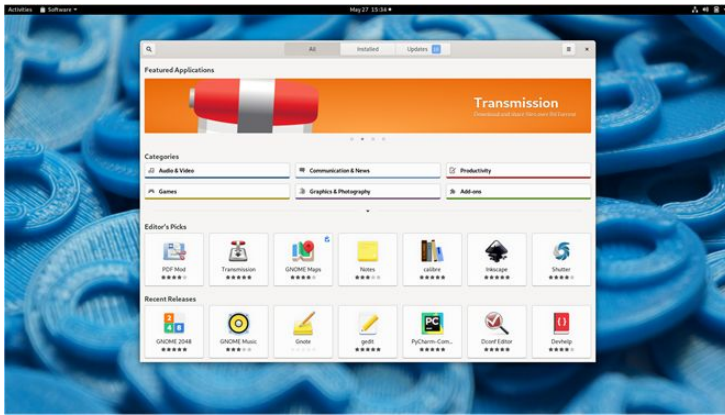
- You will need a USB key with at least 8 GB storage, USB 2.0 or higher
- Important: Root access or SUDO access is needed to perform these operations.

Method 1 - Using Fedora Media Writer

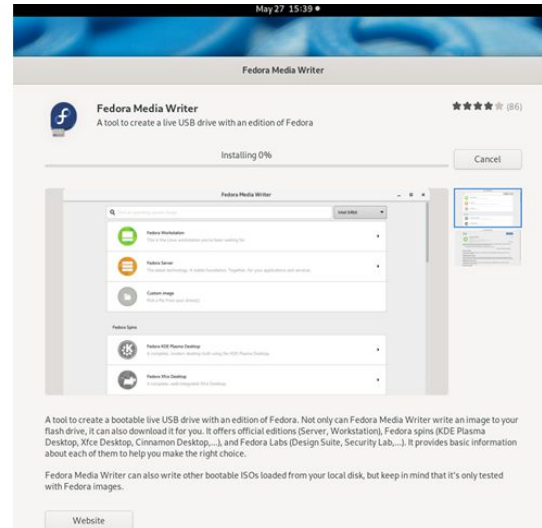
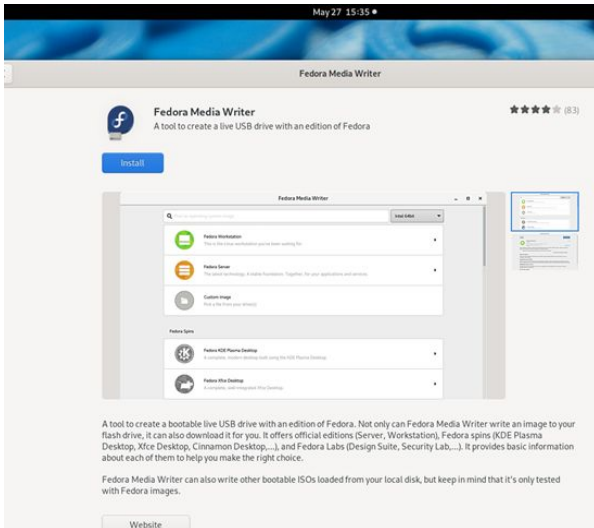
1. **Download the Remote Exam Bootable Live USB** from [here](#) and save it in the local hard drive.
2. **Download 'Fedora Media Writer'** from the Software Download Utility



3. **Search for "Fedora Media Writer"** in the Software Download Utility

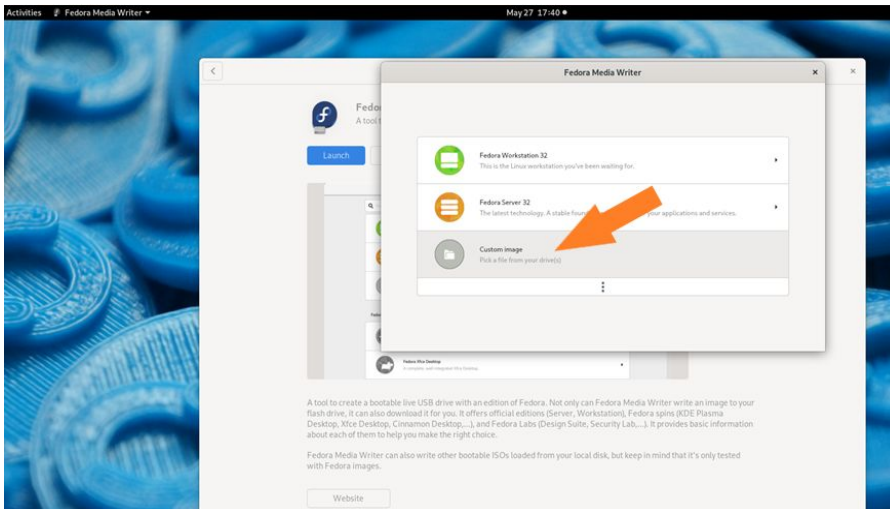


4. Select and Install

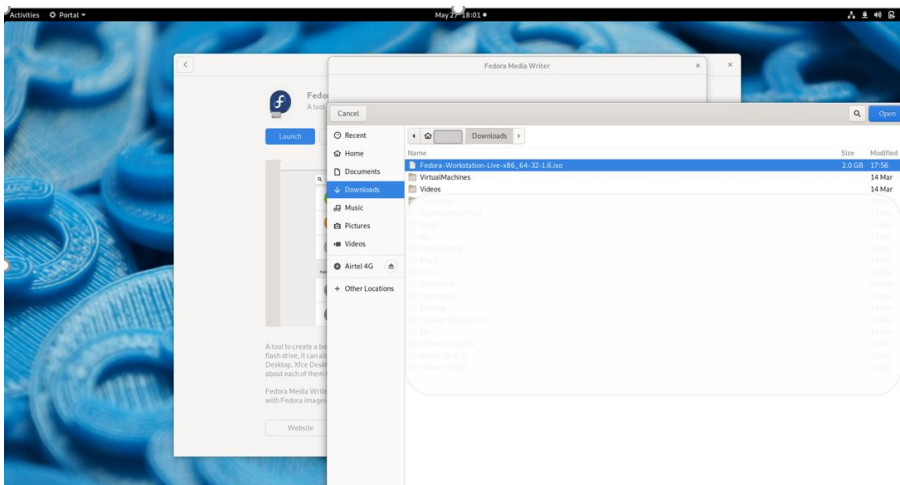


5. Click on Launch after installation

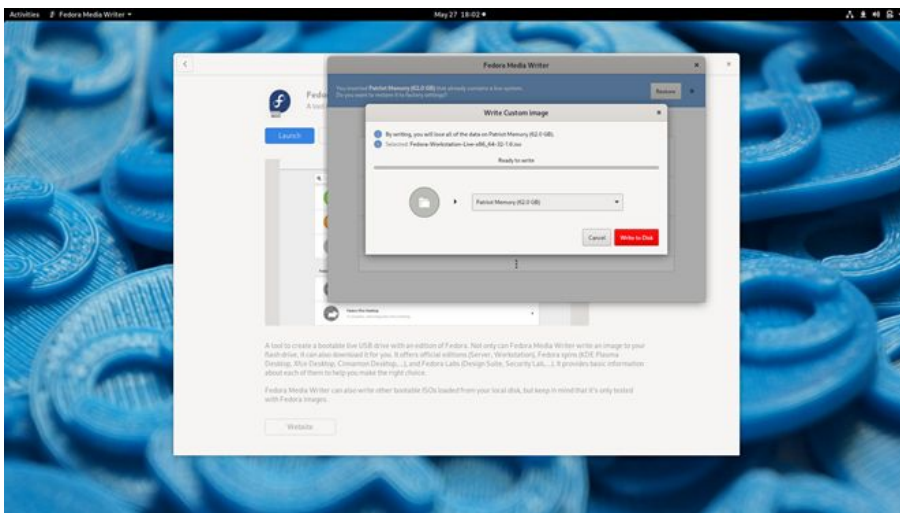
6. Select 'Custom Image' at the Fedora Media Writer screen



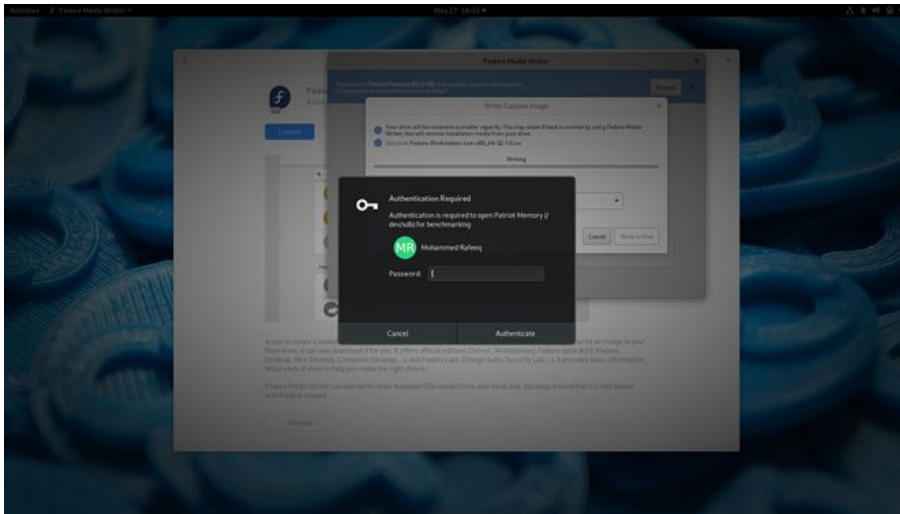
7. Select the Remote Exam Bootable Live USB image stored in your computer



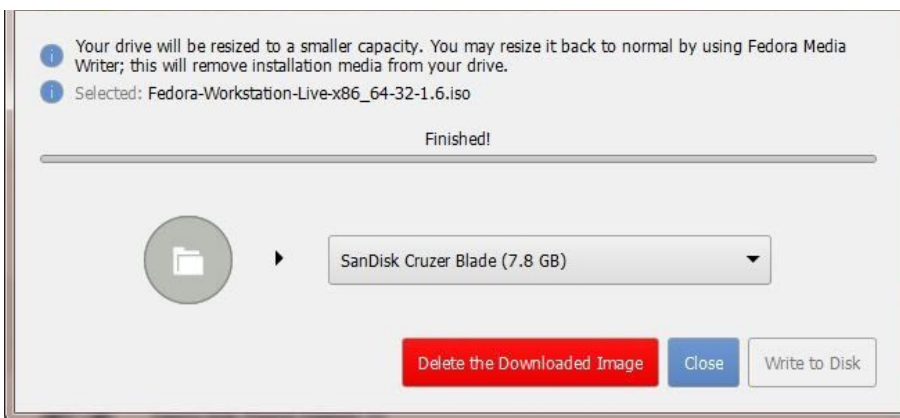
8. Select Write To Disk - Plugin the USB disk if you haven't already done so and ensure that the right USB disk is detected in the Fedora Media Writer screen



9. Enter the root password to your Fedora operating system to proceed



10. **Close and remove the USB Drive** once finished

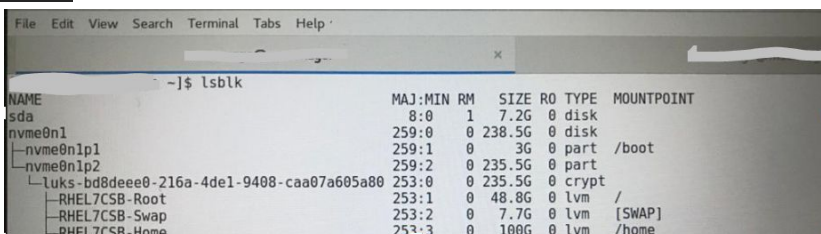


11. **Boot to the Remote Exam Bootable Live USB** - [Go to instructions](#)

Method 2 - Using the dd utility

1. **Download the Remote Exam Bootable Live USB** from [here](#) and save it in the local hard drive.
2. **Open Terminal window and run the dd command** to write the installation ISO image directly to the USB device
3. **Use the lsblk command to find the attached usb drive** (For ex: It can be sda,sdb or sdc). Here it is sda.

\$ lsblk



4. As a sudo user run the dd command, enter the sudo password when prompted

```
$ sudo dd if=/home/<<user>>/Downloads/<<File_name_of_image.iso>> of=/dev/sda bs=512k
```

```
~]$ sudo dd if=/home/.../Downloads/Fedora-Workstation-Live-x86_64-32-1.6.iso of=/dev/sda bs=512k
3750+1 records in
3750+1 records out
1966178304 bytes (2.0 GB) copied, 402.161 s, 4.9 MB/s
~]$
~]$
~]$ lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT
sda                                  8:0    1  7.2G  0 disk
```

5. Execute lsblk command again and you can see the partitions for sda (i.e., sda1, sda2,sda3)

```
~]$ lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT
sda                                  8:0    1  7.2G  0 disk
├─sda1                               8:1    1   1.9G  0 part
├─sda2                               8:2    1    11M  0 part
├─sda3                               8:3    1  22.9M  0 part
└─nvme0n1                            259:0    0 238.5G  0 disk
   ├─nvme0n1p1                       259:1    0     3G  0 part  /boot
   ├─nvme0n1p2                       259:2    0  235.5G  0 part
   └─luks-bd8deee0-216a-4de1-9408-caa07a605a80 253:0    0  235.5G  0 crypt
      ├─RHEL7CSB-Root                 253:1    0   48.8G  0 lvm   /
      ├─RHEL7CSB-Swap                 253:2    0    7.7G  0 lvm   [SWAP]
      └─RHEL7CSB-Home                 253:3    0   100G  0 lvm   /home
```

6. Unplug the usb and connect it again, you can see the mount point now /run/media/<<user>>/<<Live_USB_Image_Name>>

```
File Edit View Search Terminal Tabs Help
~]$ lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT
sda                                  8:0    1  7.2G  0 disk
├─sda1                               8:1    1   1.9G  0 part  /run/media/.../Fedora-WS-Live-32-1-6
├─sda2                               8:2    1    11M  0 part
├─sda3                               8:3    1  22.9M  0 part
└─nvme0n1                            259:0    0 238.5G  0 disk
   ├─nvme0n1p1                       259:1    0     3G  0 part  /boot
   ├─nvme0n1p2                       259:2    0  235.5G  0 part
   └─luks-bd8deee0-216a-4de1-9408-caa07a605a80 253:0    0  235.5G  0 crypt
      ├─RHEL7CSB-Root                 253:1    0   48.8G  0 lvm   /
      ├─RHEL7CSB-Swap                 253:2    0    7.7G  0 lvm   [SWAP]
      └─RHEL7CSB-Home                 253:3    0   100G  0 lvm   /home
```

7. Boot to the Remote Exam Bootable Live USB - [Go to instructions](#)

OS: RHEL 7.0 or 8.0

- You will need a USB key with at least 8 GB storage, USB 2.0 or higher
- Important: Root access or SUDO access is needed to perform these operations.

1. Download the RE Bootable Image from [here](#) and save it in the local hard drive.
2. Open Terminal window and run the dd command to write the installation ISO image directly to the USB device
3. Use the lsblk command to find the attached usb drive (For ex: It can be sda,sdb or sdc). Here it is sda.

```
$ lsblk
```

```

File Edit View Search Terminal Tabs Help
~]$ lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT
sda                                  8:0  1  7.2G  0 disk
nvme0n1                             259:0  0 238.5G  0 disk
├─nvme0n1p1                          259:1  0    3G  0 part  /boot
├─nvme0n1p2                          259:2  0 235.5G  0 part
└─┬─luks-bd8deee0-216a-4de1-9408-caa07a605a80 253:0  0 235.5G  0 crypt
   │├─RHEL7CSB-Root                    253:1  0  48.8G  0 lvm  /
   │├─RHEL7CSB-Swap                    253:2  0   7.7G  0 lvm  [SWAP]
   └─RHEL7CSB-Home                      253:3  0  100G  0 lvm  /home

```

4. As a sudo user run the dd command, enter the sudo password when prompted

\$ sudo dd if=/home/<<user>>/Downloads/<<File_name_of_image.iso>> of=/dev/sda bs=512k

```

~]$ sudo dd if=/home/.../Downloads/Fedora-Workstation-Live-x86_64-32-1.6.iso of=/dev/sda bs=512k
3750+1 records in
3750+1 records out
1966178304 bytes (2.0 GB) copied, 402.161 s, 4.9 MB/s
~]$
~]$ lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT
sda                                  8:0  1  7.2G  0 disk

```

5. Execute lsblk command again and you can see the partitions for sda (i.e., sda1, sda2,sda3)

```

~]$ lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT
sda                                  8:0  1  7.2G  0 disk
├─sda1                              8:1  1  1.9G  0 part
├─sda2                              8:2  1   11M  0 part
├─sda3                              8:3  1  22.9M  0 part
└─nvme0n1                             259:0  0 238.5G  0 disk
   ├─nvme0n1p1                       259:1  0    3G  0 part  /boot
   ├─nvme0n1p2                       259:2  0 235.5G  0 part
   └─┬─luks-bd8deee0-216a-4de1-9408-caa07a605a80 253:0  0 235.5G  0 crypt
      │├─RHEL7CSB-Root                253:1  0  48.8G  0 lvm  /
      │├─RHEL7CSB-Swap                253:2  0   7.7G  0 lvm  [SWAP]
      └─RHEL7CSB-Home                  253:3  0  100G  0 lvm  /home

```

6. Unplug the usb and connect it again, you can see the mount point now /run/media/<<user>>/<<Live_USB_Image_Name>>

```

File Edit View Search Terminal Tabs Help
~]$ lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT
sda                                  8:0  1  7.2G  0 disk
├─sda1                              8:1  1  1.9G  0 part  /run/media/.../Fedora-WS-Live-32-1-6
├─sda2                              8:2  1   11M  0 part
├─sda3                              8:3  1  22.9M  0 part
└─nvme0n1                             259:0  0 238.5G  0 disk
   ├─nvme0n1p1                       259:1  0    3G  0 part  /boot
   ├─nvme0n1p2                       259:2  0 235.5G  0 part
   └─┬─luks-bd8deee0-216a-4de1-9408-caa07a605a80 253:0  0 235.5G  0 crypt
      │├─RHEL7CSB-Root                253:1  0  48.8G  0 lvm  /
      │├─RHEL7CSB-Swap                253:2  0   7.7G  0 lvm  [SWAP]
      └─RHEL7CSB-Home                  253:3  0  100G  0 lvm  /home

```

7. Boot to the Remote Exam Bootable Live USB - [Go to instructions](#)

OS: Macintosh - El Capitan, Mojave and Catalina

Using the dd utility

- You will need a USB key with at least 8 GB storage, USB 2.0 or higher
 - Important: Root access or SUDO access is needed to perform these operations.
 - Important: Newer Mac users will need a USB-C to Ethernet adapter converter for plugging in a network cable and a USB to Thunderbolt adapter to connect a conventional wired mouse/keyboard
1. **Download the Remote Exam Bootable Live USB** from [here](#) and save it in the local hard drive.
 2. **Connect the USB drive** and run the below command to list the disks

```
$ diskutil list
```

```
The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
iMac:~ syed$ diskutil list
/dev/disk0 (internal, physical):
#:          TYPE NAME          SIZE          IDENTIFIER
0:          GUID_partition_scheme  *1.0 TB       disk0
1:          EFI EFI              209.7 MB      disk0s1
2:          Apple_APFS Container disk2  1000.0 GB     disk0s2

/dev/disk1 (internal, physical):
#:          TYPE NAME          SIZE          IDENTIFIER
0:          GUID_partition_scheme  *28.0 GB      disk1
1:          EFI EFI              314.6 MB      disk1s1
2:          Apple_APFS Container disk2  27.7 GB       disk1s2

/dev/disk2 (synthesized):
#:          TYPE NAME          SIZE          IDENTIFIER
0:          APFS Container Scheme -   +1.0 TB       disk2
           Physical Stores disk1s2, disk0s2
1:          APFS Volume Macintosh HD - Data  170.6 GB      disk2s1
2:          APFS Volume Preboot             81.8 MB       disk2s2
3:          APFS Volume Recovery            528.5 MB      disk2s3
4:          APFS Volume VM                  2.1 GB        disk2s4
5:          APFS Volume Macintosh HD         11.2 GB       disk2s5

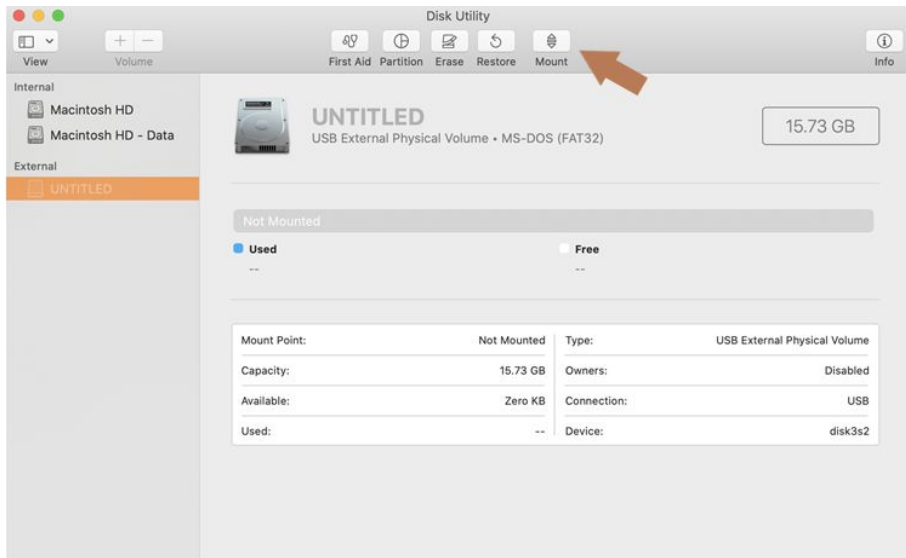
/dev/disk3 (external, physical):
#:          TYPE NAME          SIZE          IDENTIFIER
0:          Apple_partition_scheme  *15.9 GB      disk3
1:          Apple_partition_map        6.1 KB        disk3s1
2:          Apple_HFS                  8.4 MB        disk3s2
3:          Apple_HFS Red Hat Remote Exams  17.9 MB       disk3s3
```

- The connected drive address and name would be listed. In the above example, the USB drive is /dev/disk3
- Unmount the disk named /dev/disk3 (if this step is not completed, then you will get a "Resource Busy" error while attempting to write a bootable image)

```
$ diskutil unmountDisk /dev/disk3
```

Sample Output: **Unmount of all volumes on disk3 was successful**

- The disk can also be unmounted by going to the Disk Utility, locating the USB drive and clicking on the 'Unmount' button at the top



3. **Create the disk image with dd:** In the terminal, run

```
$ sudo dd if=/home/⟨⟨user⟩⟩/Downloads/⟨⟨File_name_of_image.iso⟩⟩ of=/dev/disk3 bs=512k
```

****Replace "/home/⟨⟨user⟩⟩/Downloads/⟨⟨File_name_of_image.iso⟩⟩" by the actual path to the remote exam image in the Mac hard drive**

4. **Enter sudo password at the prompt:**



The .iso to usb writing process takes time. Wait patiently at the terminal screen. Final output could look something like below:

```
2358+1 records in
2358+1 records out
1236664320 bytes transferred in 514.656396 secs (2402893 bytes/sec)
```

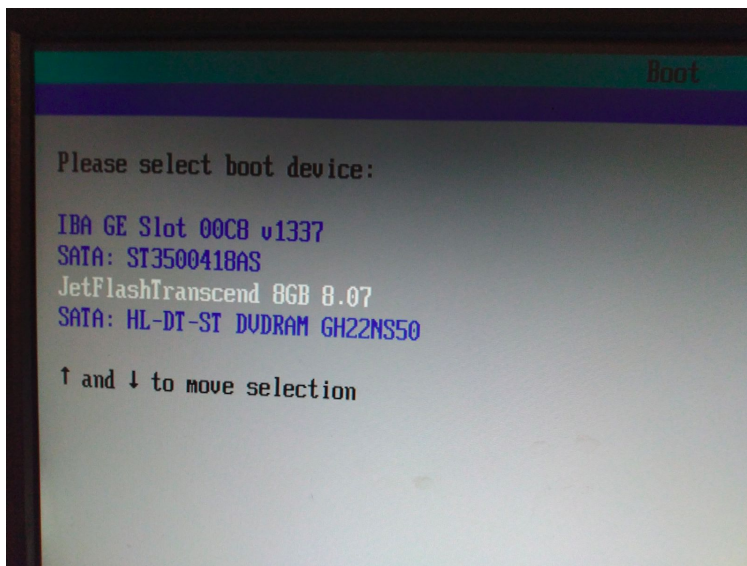
5. **Boot to the Remote Exam Bootable Live USB** - [Go to instructions](#)

Note to Red Hat Associates

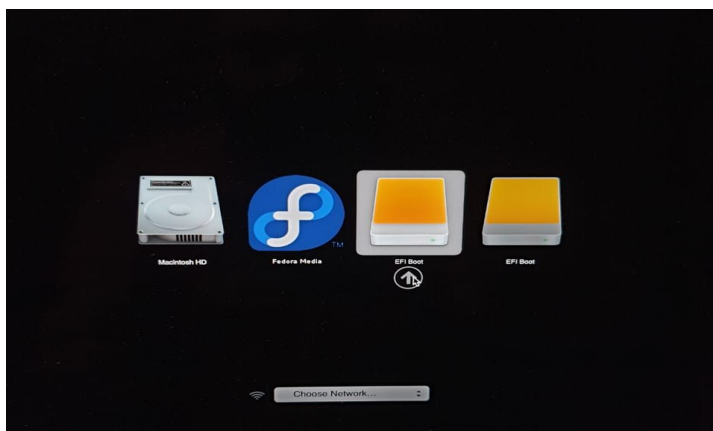
- [Click Here](#) for steps to create a Live USB on a Red Hat corporate operating system
- Booting to the Remote Exam Live USB - see section below.

Booting to the Remote Exam Live USB image

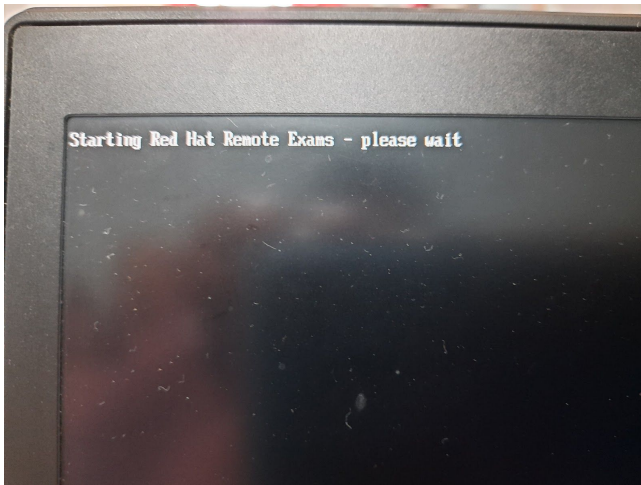
1. **Restart your computer/Mac and go to the Boot Menu.** Select your boot device as USB Flash Drive.
 - a. Note: Depending on your hardware, the keystroke to enter the boot menu may differ. The typical keys used for various hardware are, but not limited to 'delete', 'enter', F2, F4, F10 and F12. Look at the splash screen when the computer starts to know the key to enter startup or modify boot order.
 - b. For Mac, press and hold the Option key to access the startup manager and select the boot device
2. **Boot order selection screen** - will differ on various systems, a typical screen given below:



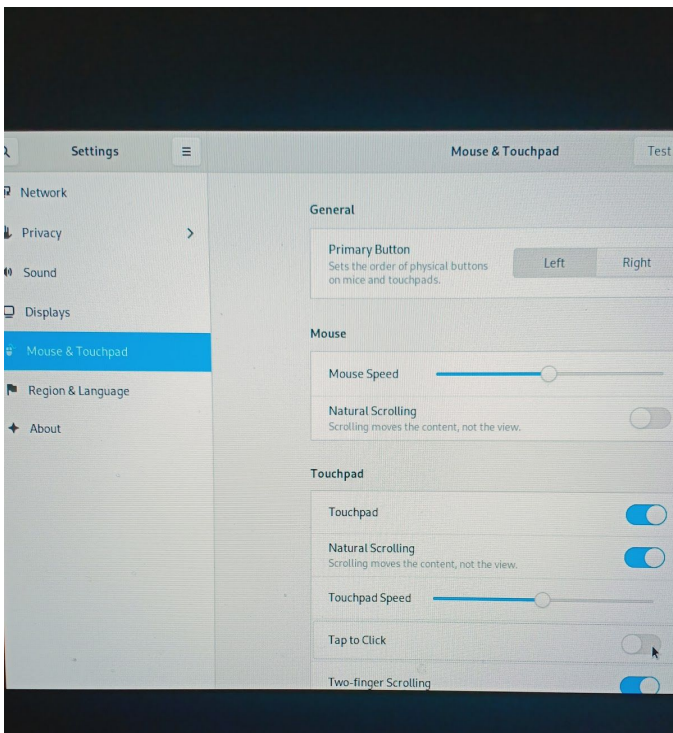
A typical Macintosh boot screen would look like below. ****Select any of the EFI Boot icons**



3. **Wait for the exam to load**



4. **Click OK at the welcome screen**
5. **Use the Settings page to make changes** such as mouse and touchpad speed, region/language, sound levels etc. The hamburger button next to 'Settings' provides a list of available keyboard shortcuts

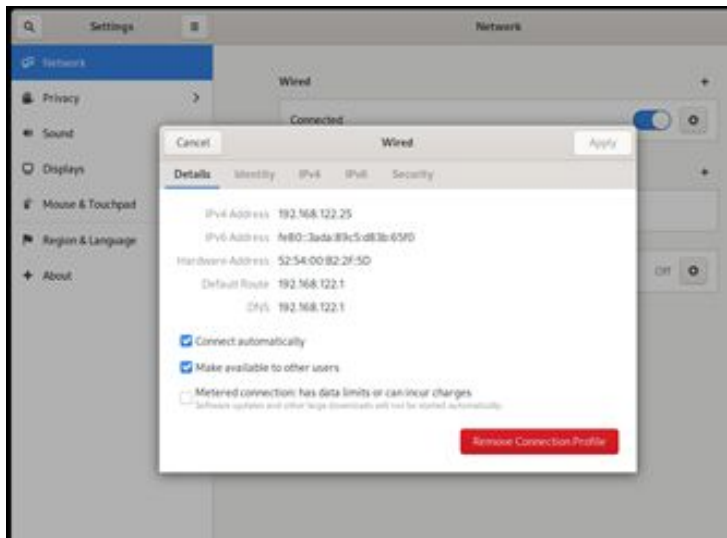


6. **Go to Network** and make sure that your wired internet connection is recognized.

Wifi compatibility with the Remote Exam Live USB cannot be guaranteed on all makes of hardware. Wifi may not be listed if the wireless adapter is not recognized by the image.

If the Wifi adapter in your computer is recognized, you may be able to connect to a wireless router with the router password. Additional credentials may be needed to connect to your Internet Service Provider. Please note that network performance and stability will depend on

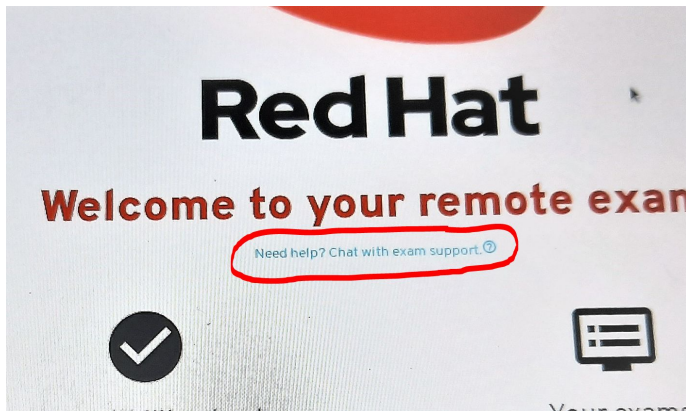
various aspects such as the distance between your computer and the wifi router, bandwidth shared with other connected devices etc.



7. **After connecting to the internet**, close the settings window to connect to the Red Hat Individual Exam Scheduler page
8. **Login using your redhat.com account username and password.** Ensure that this is the same that was used to purchase the exam
9. **Once inside the Live Environment, run the Compatibility Check** to verify that your system requirements are met.



10. **Raise a live chat with support** if you have questions during the compatibility test.



11. **Return to the main section** and press the power button of your computer briefly to get the prompt to shut the machine down
12. **Your Exams section** will display your scheduled exams within the next 24 hours. Please click on this section next to the compatibility check to proceed if you are going to start your exam.

Frequently Asked Questions

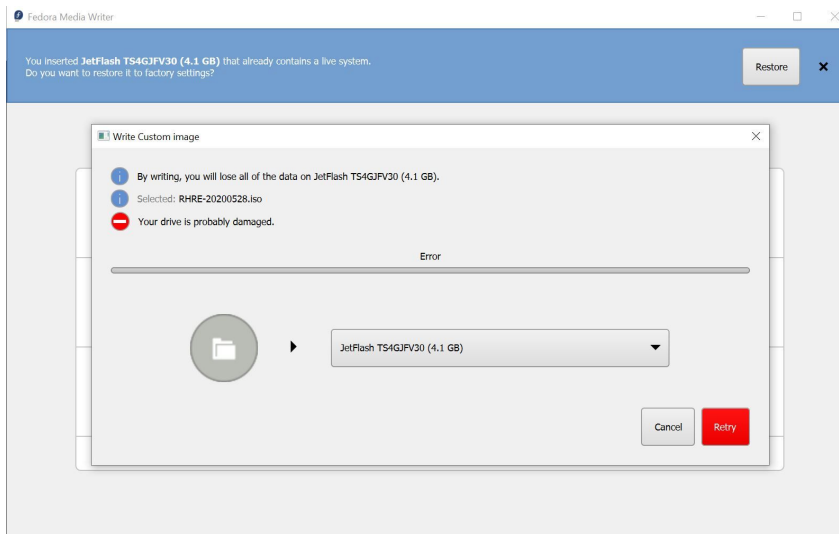
Hardware and Bootable Media

Why does it take a very long time to download the Remote Exam Live USB image?

The Remote Exam Live USB image is approximately 2 GB in size. Download speeds can vary depending on a variety of factors such as the available bandwidth and download speed of your internet connection at the time of downloading, number of users connected to the same router, distance from your wifi router, hardware specifications etc.

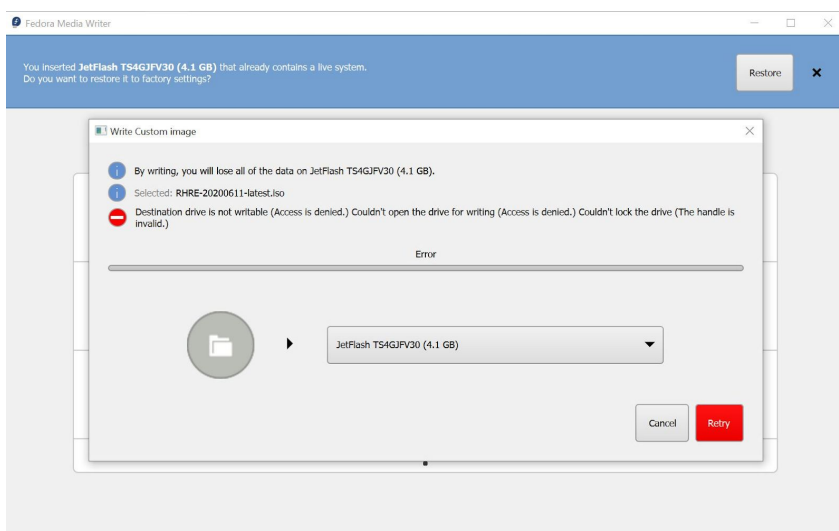
Fedora Media Writer throws errors while creating a Live USB on Windows 10

There are a few errors seen occasionally when Fedora Media Writer is used to create a Live USB from an iso file in Windows 10. Some of the screenshots given below.



- The Remote Exam image size is at the borderline of 4GB and hence using an old 4GB thumb drive will cause the above error as the actual size of the image exceeds 4000 Megabytes. Use a drive that is 8 GB or larger in size.
- Fedora Media Writer saves the ISO to your USB and then reads it back to verify that it gets the same data back as it wrote. If the read does not match the write, FMW will show an error saying 'Your Disk is Probably Damaged'. This is a very stark message which actually means "Warning - there are inconsistencies between what was written and what was read back". There are many possible reasons why the read might not match the write and it doesn't always necessarily mean that the write failed or that the USB will not work. You can ignore this message on an otherwise known good USB and continue using the same.

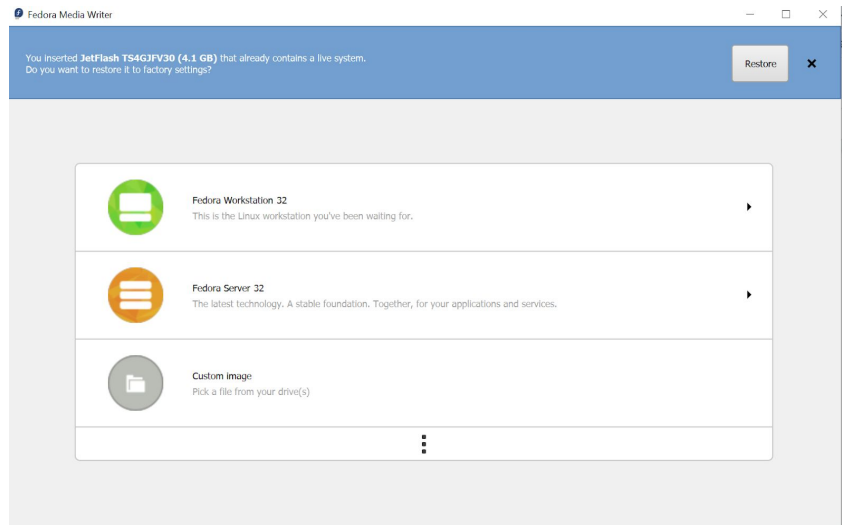
Click on 'Cancel' to exit Fedora Media Writer, reboot your system and try to boot from the USB drive. If it boots successfully to the Remote Exam image, the USB drive and the image on it is fine and can be used for your exam.



- Clicking on the Retry button and re-attempting the write process may fix the error
- The above error may also appear if there is an existing Live USB in the disk already. The presence of a Live USB will be detected by FMW and a 'Restore' option will be available to format the drive. Click on Restore, finish the format process and reattempt the process of creating a Live USB.

After the exam, how do I reformat my USB drive?

Using Fedora Media Writer: Connect the USB drive to your computer and start Fedora Media Writer. You will see a prompt to restore the USB drive to “Factory Settings”:



Follow the instructions to restore your USB drive to the Factory Settings:

**Note to Windows Users: “Factory Settings” would most likely imply that your USB drive is formatted in FAT32 file system. FAT32 does not allow transfer of files larger than 4GB and hence most Windows users prefer NTFS.

exFAT handles larger files and is Windows and Mac OS compatible. Hence, you will need to use an additional level of formatting using the Windows format utility.

Can I use a wireless internet connection?

Wifi is not advised. Wherever possible, use a wired internet connection for stability and compatibility. Wifi speeds can vary based on a variety of factors which may have an impact on your exam. The Remote Exam Live USB may not detect all wireless network adapters. If the wifi adapter of your computer is not detected by the Remote Exam Live USB image, then wired internet will be the only option.

How many free USB ports should be available for use during the exam?

You should ideally have a minimum of two USB ports available in a laptop for a bootable USB drive and an external web camera. In the case of a desktop computer, the requirement would be four ports for the following devices: One external webcam, USB drive, keyboard and mouse.

I am unable to download the Remote Exam Live USB image

Your computer and the network you are connecting from must have the necessary privileges and permissions to download files from a third party source. The operating system used must have administrative (Windows) or root/sudo privilege (Linux/Mac). Firewalls and Security restrictions on your network setup might block such downloads. Try a personal computer and/or home network to perform these tasks.

Can I boot to the exam environment using a virtual machine rather than a USB drive?

No. The Remote Exam image must be loaded on a USB drive. Booting off a Virtual Machine is not allowed.

Can I create a bootable live USB by keeping my existing data in the same USB drive?

No. The process of live USB creation will wipe out any existing data and reformat your USB drive as needed.

Is a desktop computer allowed?

Yes

Is an iMac allowed?

Compatibility cannot be guaranteed. If your pre-exam test by booting in to the Remote Exam Live USB works fine, then you can proceed. A few things to note:

- iMacs come with wireless keyboard and mouse. Wireless devices may not work.
- Detection and stable performance of wifi internet is NOT guaranteed.
- Using a wired keyboard and mouse and a wired internet on an iMac should work fine subject to successful pre-exam testing.
- One external webcam with at least 1m cable and 90 degree field of view or more is required. The webcam must be focusable from 10 cm to 2 m.

Why am I getting a "Resource Busy" error which is not allowing me to write to USB on my Macbook?

Prior to running the dd command, the disk must be unmounted. Try either of the below:

```
$ diskutil unmountDisk /dev/disk3
```

Sample Output: **Unmount of all volumes on disk3 was successful**

The disk can also be unmounted by going to the Disk Utility, locating the USB drive and clicking on the 'Unmount' button at the top

