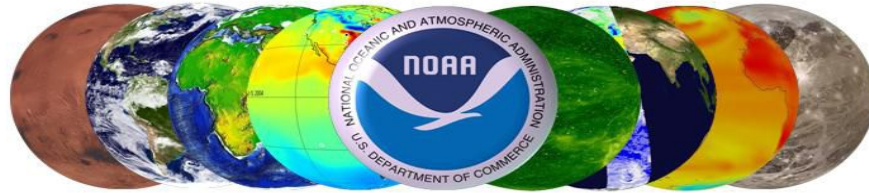


Science On a Sphere[®]



Upgrade Instructions for Ubuntu 16.04 & SOS 5.1.0+

Table of Contents

[Table of Contents](#)

[Overview of the upgrade process](#)

[1. Backup your data](#)

[2. Record SOS2's settings](#)

[3. Create the Ubuntu 16.04 installation disk](#)

[4. Wipe SOS2 and do a fresh installation of Ubuntu 16.04](#)

[5. Configure SOS2 for an SOS installation](#)

[Format the second hard drive](#)

[Setup networking](#)

[Install Ubuntu System Updates](#)

[Install the NVIDIA Driver](#)

[6. Install the SOS software](#)

[7. Start an automated transfer of SOS data and user files from SOS1 to SOS2](#)

[8. Manually copy the files you saved in step 1 & 2 back to SOS2](#)

[9. Update your iPad app](#)

[10. Switch to using SOS2 as your primary computer](#)

[11. Thoroughly test your SOS system](#)

[12. Once you are confident SOS2 is operating correctly, repeat these procedures with SOS1](#)

Overview of the upgrade process

Below is an overview of how we recommend upgrading your SOS computers. We will refer to your primary SOS machine as “SOS1” and your secondary (backup) SOS machine as “SOS2”, though they may be named differently at your site. These machines should be networked with each other. If you do not have an SOS2 machine, please contact [SOS support](mailto:sos.gsd@noaa.gov) (sos.gsd@noaa.gov) for alternative instructions for your software update. Questions regarding the installation process should be directed to [SOS support](mailto:sos.gsd@noaa.gov) (sos.gsd@noaa.gov) after reading this document.

1. Manually backup any files that you would like to keep that are on SOS2 and aren't on SOS1.
2. Record system configuration on SOS2.
3. Create the Ubuntu 16.04 installation disk.
4. Wipe SOS2 and do a fresh installation of Ubuntu 16.04 LTS.
5. Configure SOS2 for an SOS Installation. (Format the second hard drive, restore network settings & install the nvidia driver)
6. Install SOS 5.1.0 on SOS2.
7. Start an Automated Transfer of SOS data and user files from SOS1 to SOS2.
8. Manually copy the files you saved in Step 1 back to SOS2.
9. Update your iPad App.
10. Switch to using SOS2 as your primary computer.
11. Thoroughly test your SOS system.
12. Once you are confident SOS2 is operating correctly, repeat these procedures with SOS1.

1. Backup your data

Manually copy any files on SOS2 you wish to preserve that are not duplicated on SOS1. We suggest copying them to a directory on SOS1, but these could go onto external media such as a flash drive. There is a script we will use later to restore some files from SOS1. The files/directories mentioned below do not need to be backed up:

File/Directory that will be synced	Purpose
<code>/shared/sos/media/</code>	Directory containing the media tree - including site-custom
<code>/shared/sos/rt/</code>	Directory containing real time data sets
<code>/shared/sos/site-config/</code>	Directory containing alignment data and SOS key
<code>/shared/sos/etc/AnnotationIcons/</code>	Directory containing any custom annotation icons
<code>/shared/sos/kiosk/</code>	Directory containing kiosk configuration files
<code>/shared/sos/locale/</code>	Directory containing translations
<code>/etc/X11/xorg-projectors-twinview.conf</code>	File containing the nvidia driver configuration. It is synced to <code>/etc/X11/projectors/xorg-projectors-twinview.conf.hostname</code>
<code>/home/sos/auto_align_colors.yaml</code>	File containing auto alignment color definitions - most sites won't have this
<code>/home/sos/sosrc/</code>	Directory containing the sos user's presentation playlists
<code>/home/sos/sos_stream_control.config</code>	The config file for SOS
<code>/home/sosdemo/sosrc/</code>	Directory containing the sosdemo user's presentation playlists

2. Record SOS2's settings

1. Record your network configuration. (IP address, subnet mask and gateway) To do so:
 - a. In the menu bar along the top of the screen, click on the network settings icon (the double arrows)
 - b. In the dropdown, select "Connection Information".
 - c. For each tab, record the "IP Address", "Subnet Mask" and "Default Route" fields. We will use these later.
2. Record which projector config file you're using on SOS1 (NOTE - we want to know what's being used on SOS1 as that's the machine that is in primary use)
 - a. run the command: `ls -l /etc/X11/xorg-projectors-twinview.conf` in a terminal on SOS1 and record the line that is returned. We're particularly interested in the "xorg-2pc-****_****x****-projector-***.conf" part. The fields covered by asterisks will vary from site to site. They usually denote graphics card type, resolution (1920x1200 is common) and whether you're using an analog or digital signal. (CRT vs DFP)
3. If you've modified your crontab, please back that up. Logging in as user sos and running:
`crontab -l > ~/Desktop/sos2_crontab.backup`
in a terminal (that's a lower-case L after "crontab) will create a file on your desktop that you can save to your backup directory on SOS1 or to a flash drive.
4. Backup your keyfile to a directory on SOS1 or to a flash drive. The keyfile is located at `/shared/sos/site-config/soskey.bin`. This is done in case the keyfiles on SOS1 and SOS2 differ.
5. Record your nvidia driver by writing down the result of running the following command in the terminal: `dpkg -l | grep `nvidia-[0-9]\{3\}``. You will most likely see a few results. Record the result that looks like "nvidia-XXX" where XXX is something like "340" or "360". We will use this information later in Step 5, part 3.

3. Create the Ubuntu 16.04 installation disk

The currently supported operating system for Science On a Sphere[®] is Ubuntu 16.04 Desktop and can be obtained here: <http://releases.ubuntu.com/16.04/>

It is necessary to download the 64-bit version from the link labelled "64-bit PC (AMD64) desktop image" and NOT the 32-bit version. Included on the Ubuntu site and linked below are instructions on how to burn the Ubuntu image to a DVD or USB Drive. Ubuntu installation media are known as "liveDVD's" or "liveUSB's".

How to create a liveUSB:

<http://www.ubuntu.com/download/desktop/create-a-usb-stick-on-ubuntu>

<http://www.ubuntu.com/download/desktop/create-a-usb-stick-on-windows>

<http://www.ubuntu.com/download/desktop/create-a-usb-stick-on-mac-osx>

How to create a liveDVD:

<http://www.ubuntu.com/download/desktop/burn-a-dvd-on-ubuntu>

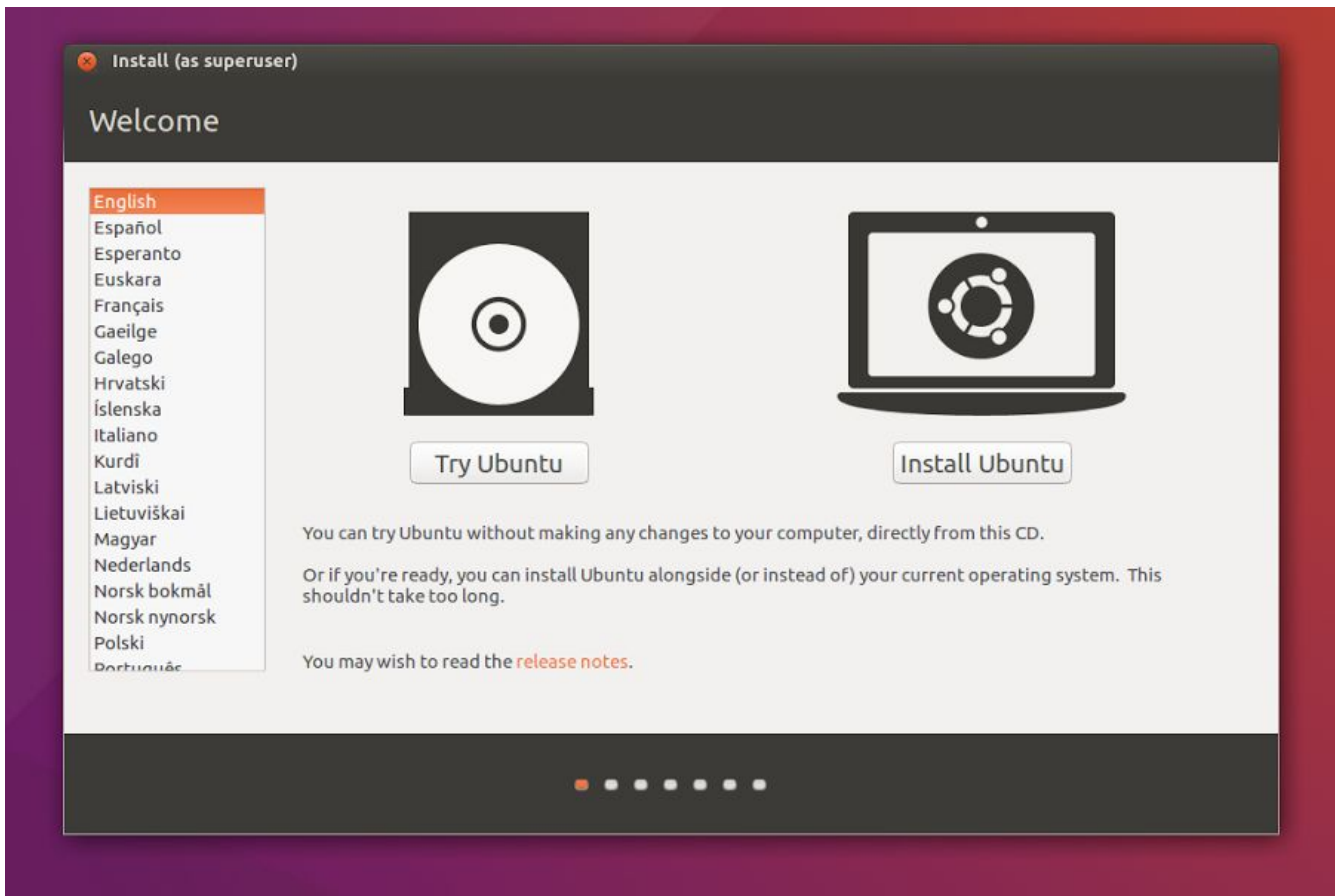
<http://www.ubuntu.com/download/desktop/burn-a-dvd-on-windows>

4. Wipe SOS2 and do a fresh installation of Ubuntu 16.04

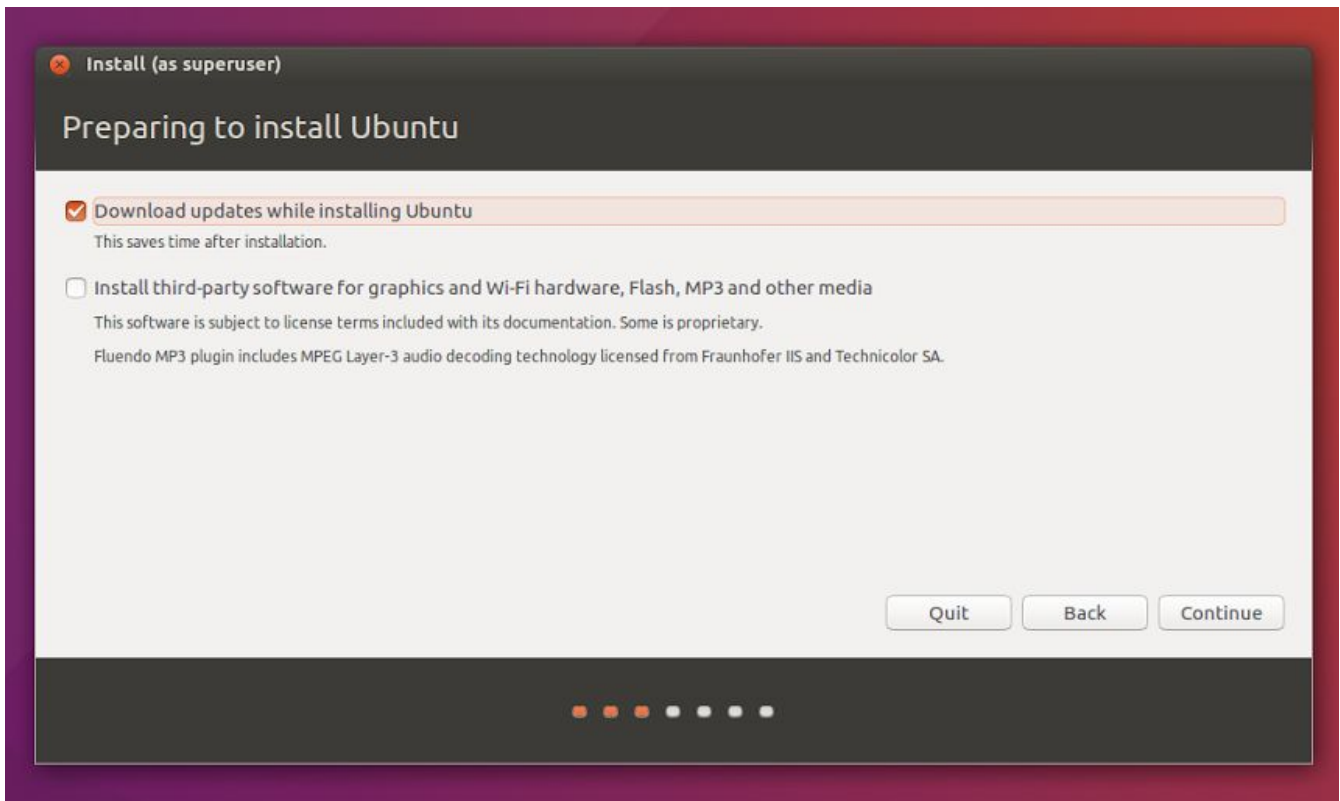
Insert the Ubuntu 16.04 installation disk (a liveDVD or liveUSB) and restart up the computer. You may need to press F12 to get the Boot Menu to appear and select to boot from the DVD or Flash Drive.

The installation disk will automatically be started and you will see an Ubuntu loading screen for a few minutes. You will then see the below screens. For more information on what each screen means, you can look here: <https://help.ubuntu.com/community/GraphicalInstall>

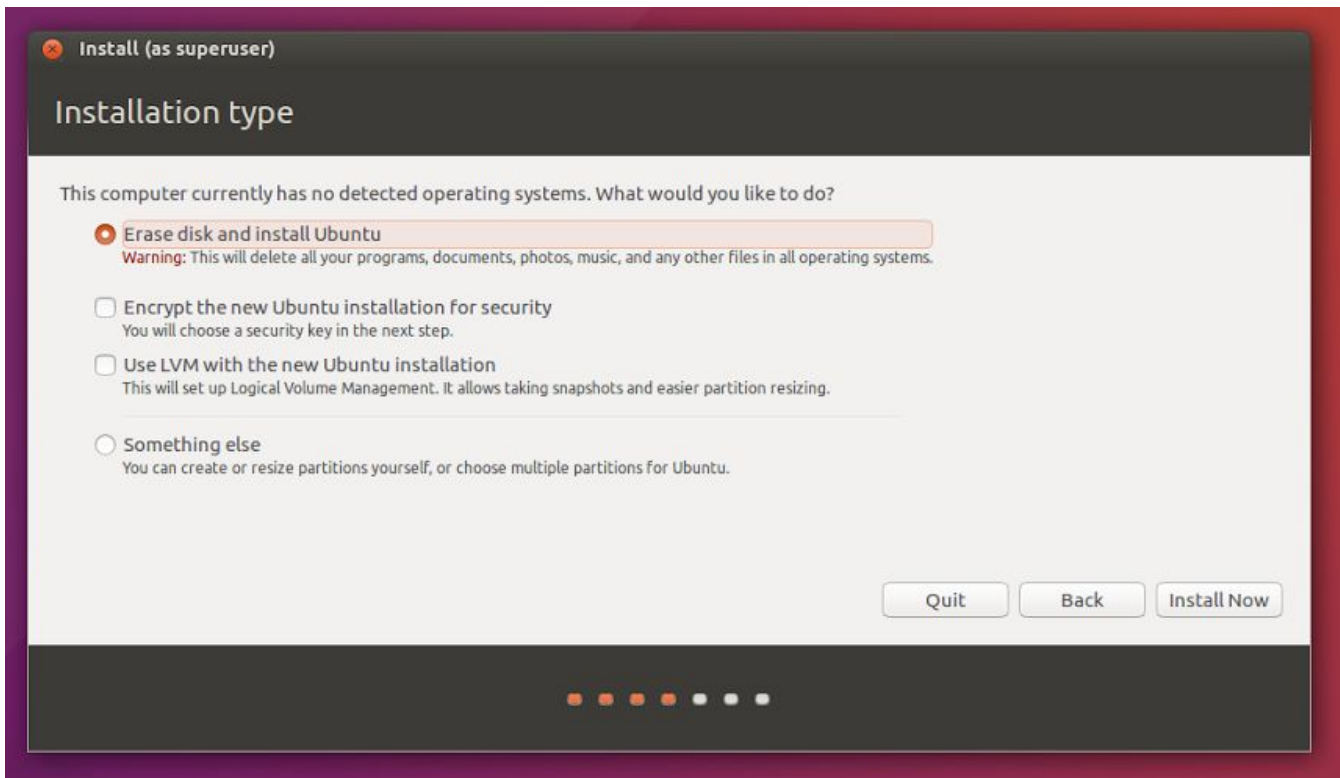
1. Select “Install Ubuntu”



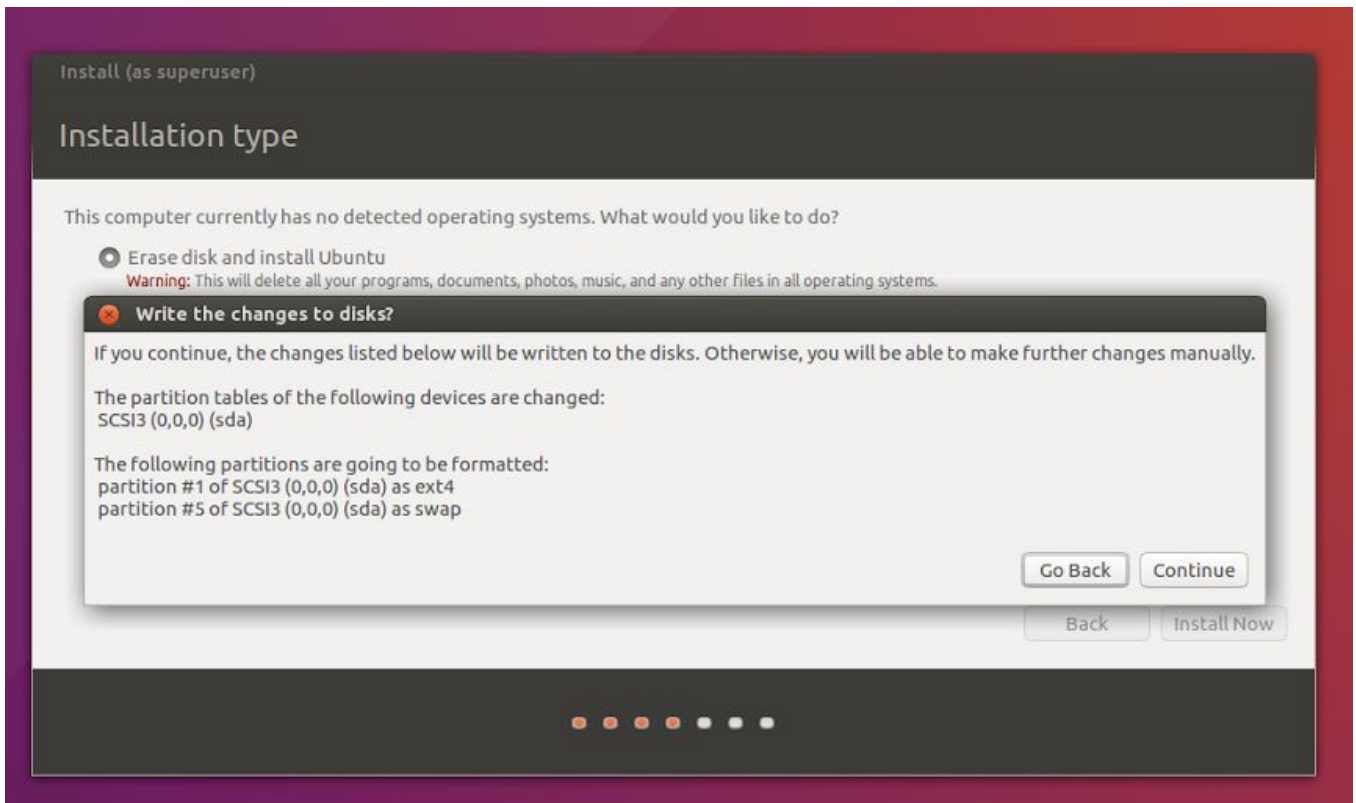
2. If you are connected to the internet, select “Download updates while installing Ubuntu”. If the option is greyed out don’t worry about it. Please DON’T select the “Install third-party software...” option.



3. Select "Erase disk and install Ubuntu." Note - this screen may vary depending on your system. Regardless, you will always want the "Erase disk and install Ubuntu" option.



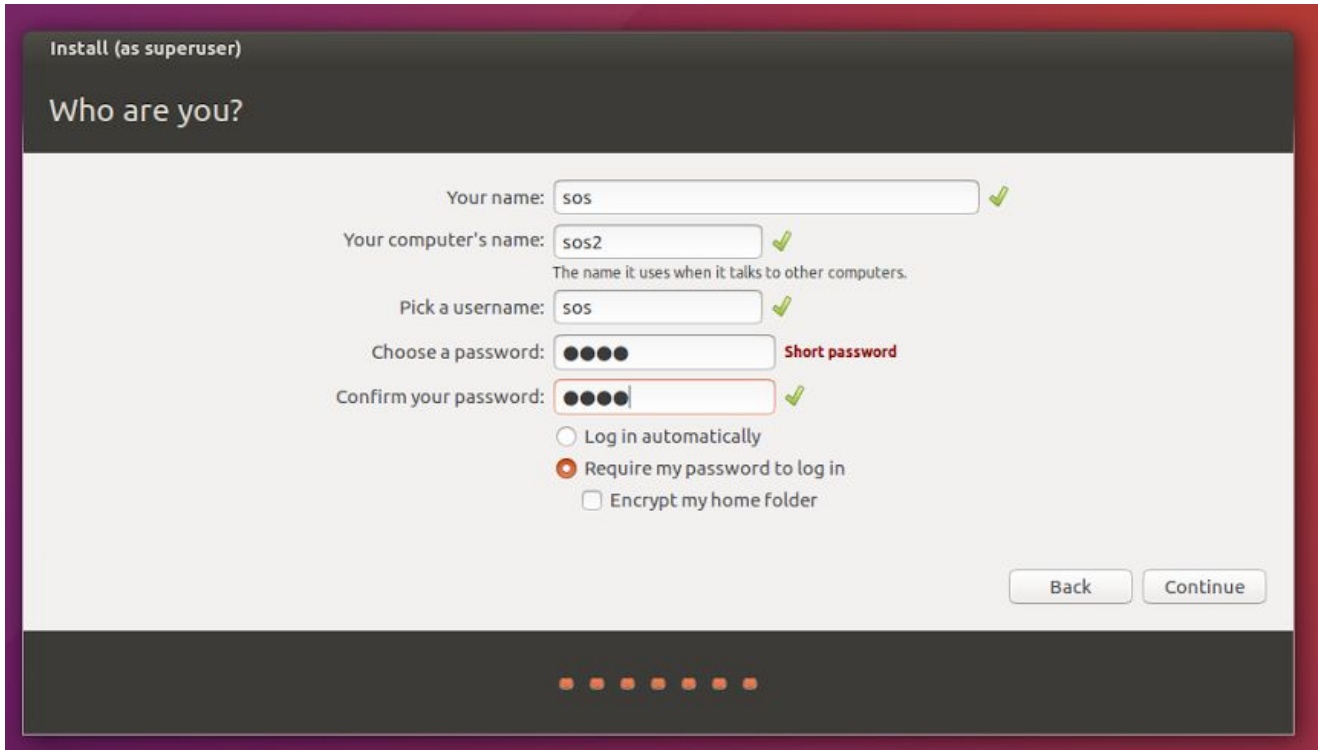
4. A pop-up will appear. Select continue.



5. You can select appropriate options and click continue through the next two screens. (Timezone & Keyboard configuration).

6. You will then encounter the next screen. The SOS software requires that you set the “Your name” and “Pick a username” fields to “sos” like in the below image. You can choose any hostname you like as long as it ends in a “2” (for the backup computer) or a “1” (for the primary computer). Since we’re currently installing the backup computer we recommend entering “sos2”.

This step will be creating the “sos” user account with administrative privileges. Our default admin password is “sos!”. You can choose whatever you’d like for the password. However, if it differs from the default, you will need to provide it to SOS Support in some support situations.

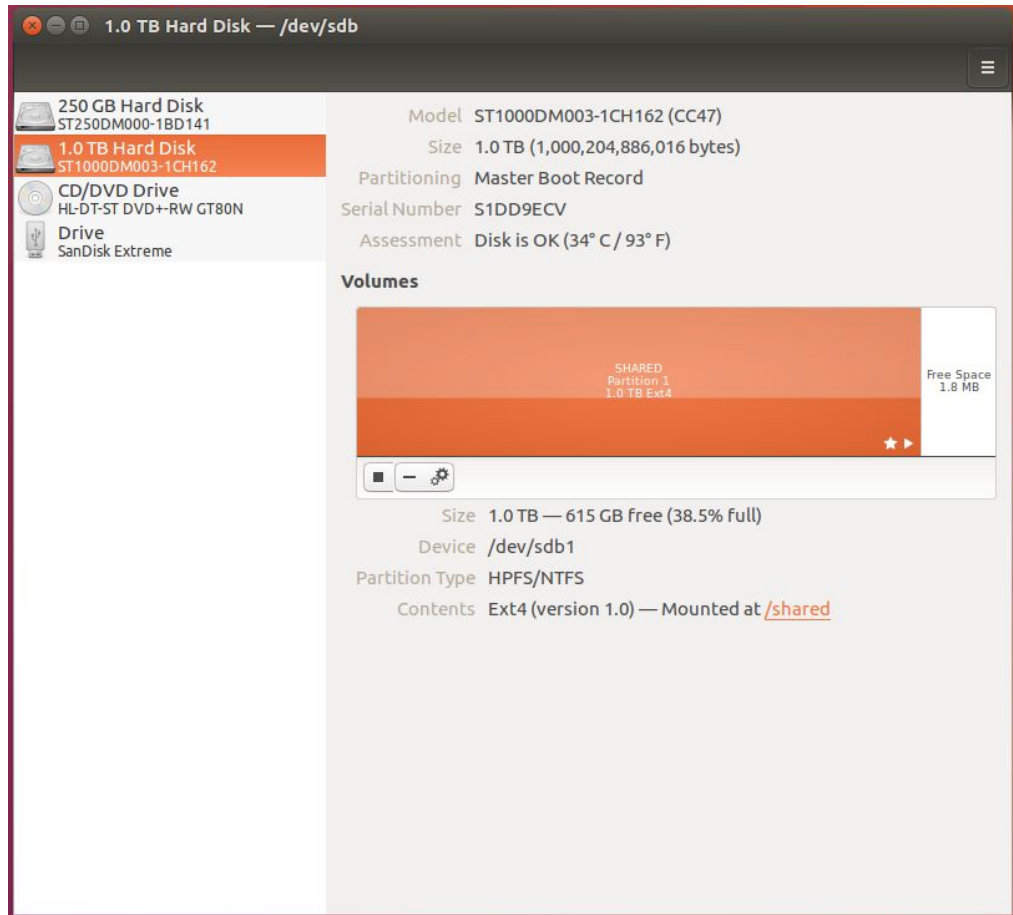


Once the installation is complete, hit the “Restart Now” button. Then, eject/remove the installation when the computer tells you to, and then hit Enter. The computer will reboot into your new Ubuntu system!

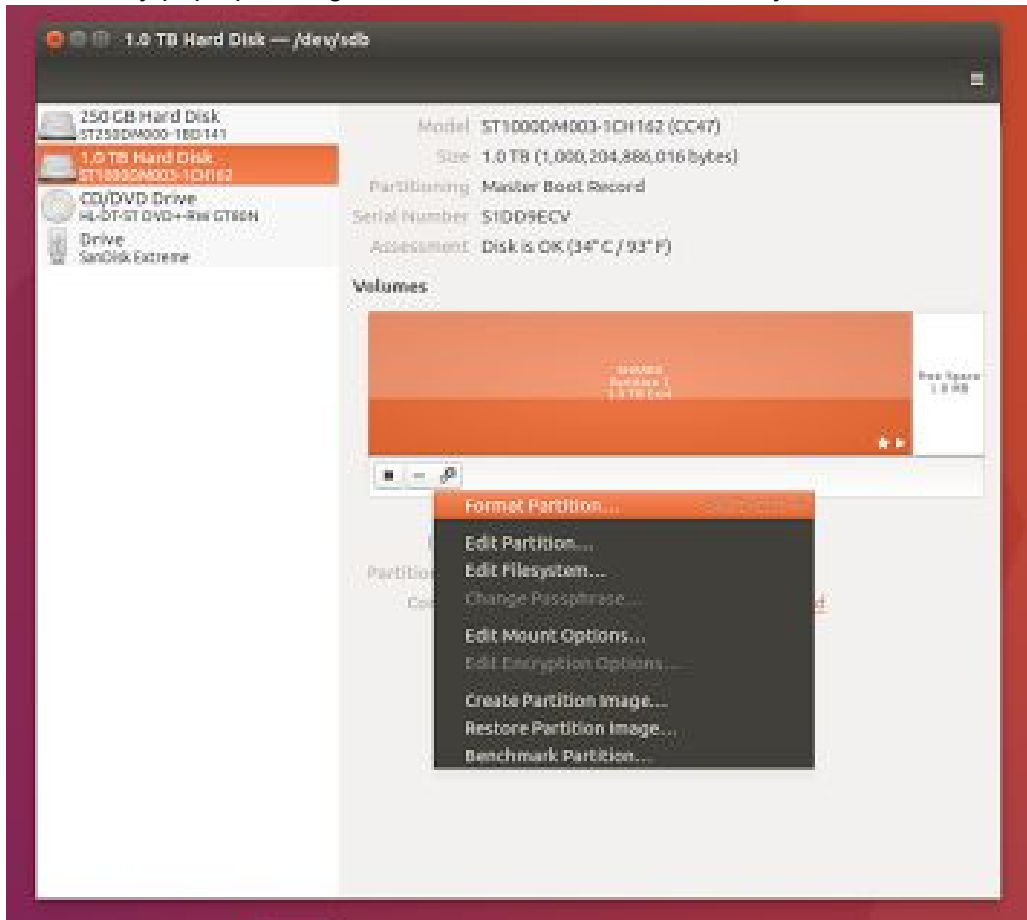
5. Configure SOS2 for an SOS installation

1. Format the second hard drive

- a. Type “Disks” in the launcher search bar. Click on the icon that appears and you will see the below screen appear. Select the largest hard disk. For most sites this will be the “1.0 TB Hard Disk”

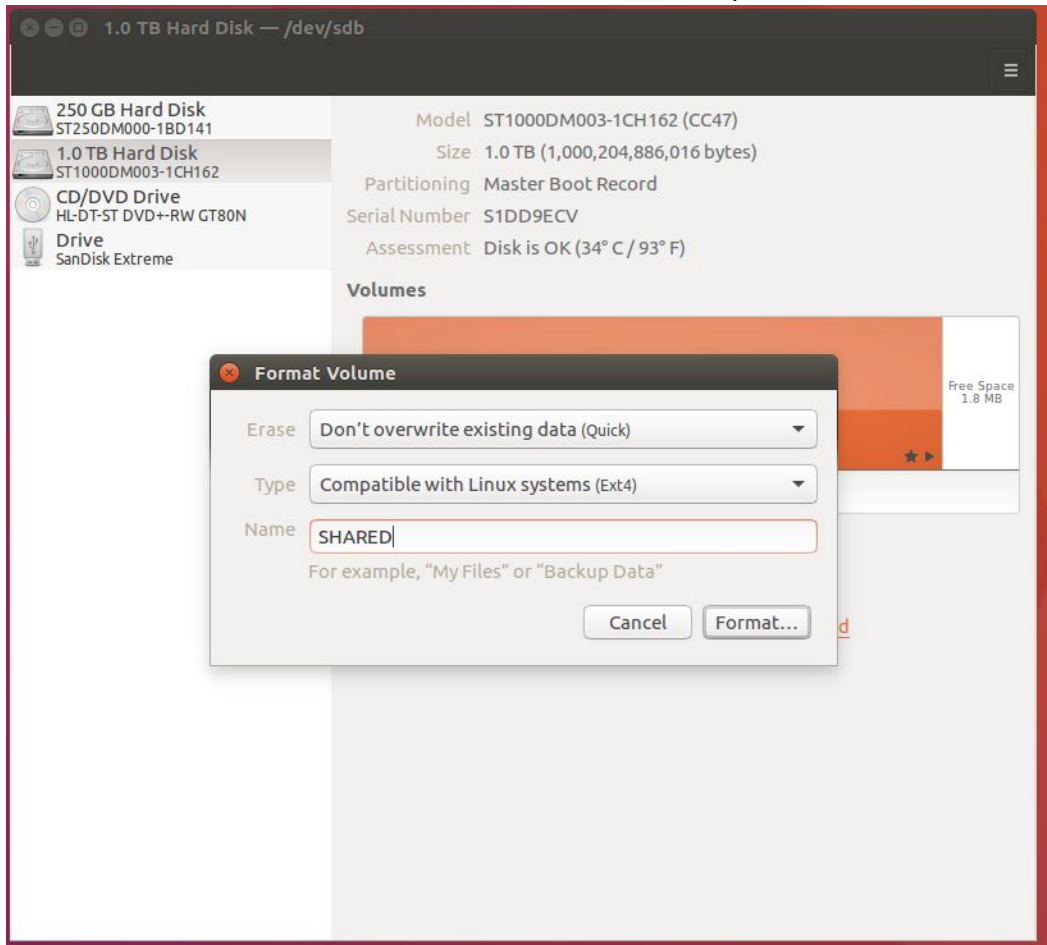


- b. Click on the small gear icon and then select “Format Partition...” from the drop-down. A screen may pop up asking for confirmation. If it does, click “yes”



- c. A pop-up will appear similar to the below screenshot. Make sure that the “Erase” field has “Don’t overwrite existing data (quick)” and the “Type” field has “Compatible with Linux systems (ext4)” selected and then enter “SHARED” (all caps) in the “Name” field

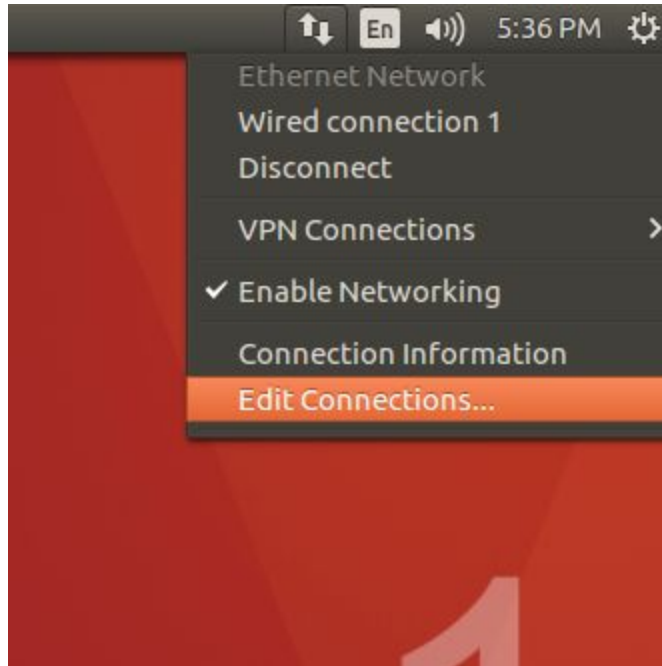
and click "Format". You will need to enter the sos user's password.



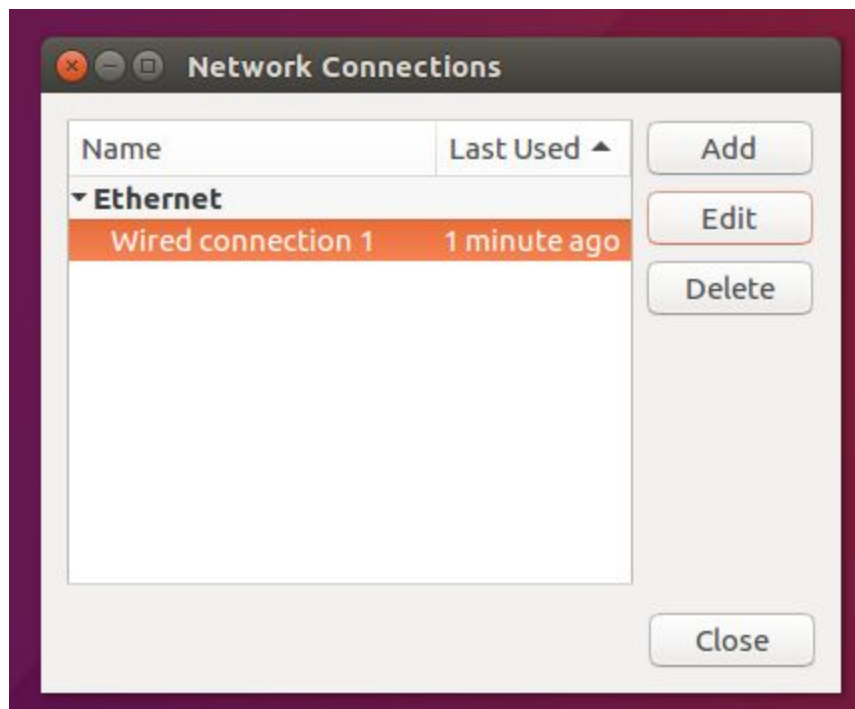
- d. Once that finishes, close the program. (Please don't mount the drive - the installation script will take care of it.)

2. Setup networking

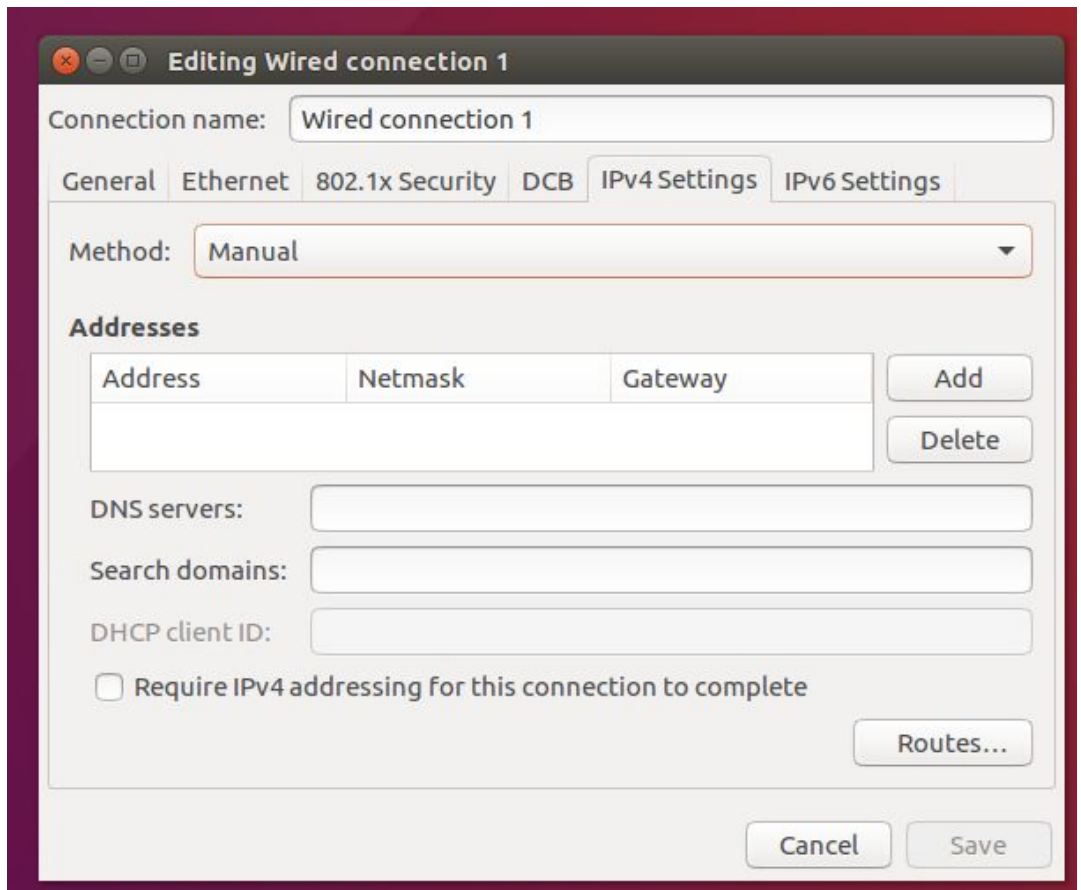
- a. Click on the network settings (double arrow or wifi icon) in the menu bar and select “Edit Connections...”



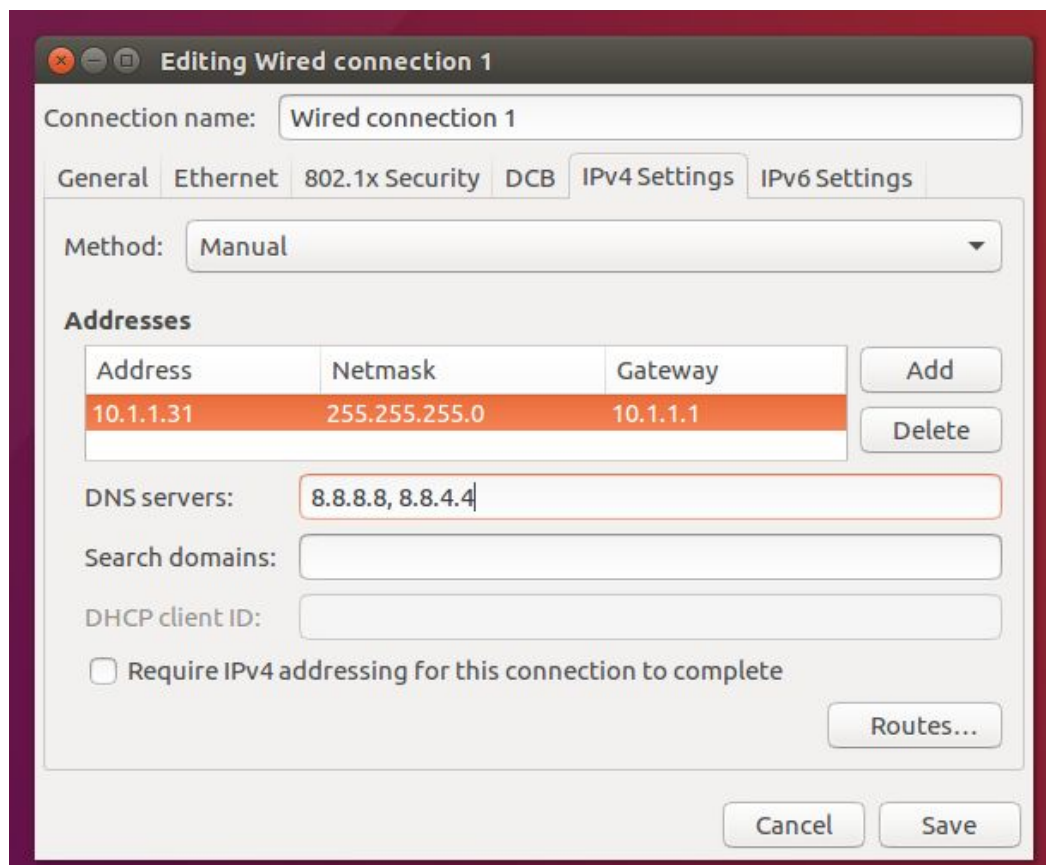
- b. Enter the network information you recorded in Step 2: Record SOS2’s Settings.
 - i. For the connection information you recorded in Step 2, select the “Wired connection” and click Edit. If you had multiple connections you may need to click “Add”.



- ii. In the window that appears select the “IPv4 Settings” tab and select “Manual” for the Method field.



- iii. Click “Add” and then enter your information in the 3 boxes in the “Addresses” field. “IP Address” from step 2 correlates to “Address”. “Subnet Mask” from step 2 correlates to “Netmask” and “Default Route” from step 2 correlates to “Gateway”. In the “DNS servers” field enter “8.8.8.8, 8.8.4.4”. (Google’s public DNS servers) Once you’re done adding information, click save. The below image has the default settings for most SOS sites SOS1 system. If you’re working on SOS2, the default IP address will most likely be “10.1.1.32”.



3. Install Ubuntu System Updates

- a. You can either open the Ubuntu “Software Updater” program and click “Install Now”.
Or:
- b. Open a terminal and enter the below commands one at a time, pressing enter between each command:
 - i. `sudo apt update`
 - ii. `sudo apt upgrade`

4. Install the NVIDIA Driver

- a. Retrieve the NVIDIA driver information you recorded in Step 2, part 5. The driver you had previously installed should be similar to `nvidia-XXX`. (e.g. “`nvidia-340`”)
- b. Type the below command, replacing the `<driver_version>` text below with the driver you previously had installed, and press enter:
 - i. `sudo apt-get -y install <driver_version>`
 - ii. If you had “`nvidia-340`” as your driver you would enter something like this:
`sudo apt-get -y install nvidia-340`

6. Install the SOS software

The installation of SOS is probably the easiest part of the install because almost everything is taken care of by our setup script. In a Terminal window enter the following:

```
wget http://sos.noaa.gov/ubuntu/sos_installer.run
chmod +x sos_installer.run
```

And then launch the installer by entering:

```
sh sos_installer.run
```

Eventually, a menu will pop up asking you whether you're using a one or two graphics cards to run your projectors (the graphics card running your monitor doesn't count) and to select a projector. Most new installations will be running digital cables (DVI) to their projectors and will have one graphics card.

If you are using a DVI cable, select an option from the "For projectors connected via DVI" column. If you are still using analog cables (VGA or UXGA) with your projectors, select an option from the "For projectors connected via VGA" column. You should choose the option that resembles the projector configuration file you recorded from Step 2 "Record SOS2's Settings". (**-***x**-projector-**)

If you aren't sure which option to select, don't select the Quit button. Choose a random option and continue - you can configure the nvidia cards later.

After that the installation should run by itself. A log file located at ~/soslogs/install.log, is created that will contain any errors. If your system is not installed properly, please send the install.log file and a description of the problem to SOS Support.

Barring any errors, the install script will prompt you to reboot which should bring your new SOS machine up and running.

To save time during the installation, the script only downloads the basic datasets. We will pull in the rest of the data in the next step.

7. Start an automated transfer of SOS data and user files from SOS1 to SOS2

SOS 5.1.0 provides a script to re-populate SOS2 with files from SOS1 (and vice-versa). You can start the transfer by entering the below in a terminal:

- `sudo /shared/sos/bin/sync-sos-files.sh`

You will want to make sure you can ssh between sos1 and sos2 freely. To do so, log in as user sos, open a terminal and do: `ssh sos1`. You may need to type “yes” and press enter to ssh freely between the two systems. You will need to do the same thing for the sosdemo user. If anything doesn’t work as expected here, please feel free to reach out to the SOS support team.

The above sync may take a while to complete based on how large your media tree is. As a reminder, it will pull the directories and files in the table below from the other SOS computer: (For example, if you’re on SOS2, it will pull files from SOS1. If you’re on SOS1 it will pull files from SOS2.)

File/Directory that will be synced	Purpose
<code>/shared/sos/media/</code>	Directory containing the media tree - including site-custom
<code>/shared/sos/rt/</code>	Directory containing real time data sets
<code>/shared/sos/site-config/</code>	Directory containing alignment data and SOS key
<code>/shared/sos/etc/AnnotationIcons/</code>	Directory containing any custom annotation icons
<code>/shared/sos/kiosk/</code>	Directory containing kiosk configuration files
<code>/shared/sos/locale/</code>	Directory containing translations
<code>/etc/X11/xorg-projectors-twinview.conf</code>	File containing the nvidia driver configuration. It is synced to <code>/etc/X11/projectors/xorg-projectors-twinview.conf.hostname</code>
<code>/home/sos/auto_align_colors.yaml</code>	File containing auto alignment color definitions - most sites won’t have this
<code>/home/sos/sosrc/</code>	Directory containing the sos user’s presentation playlists
<code>/home/sos/sos_stream_control.config</code>	The config file for SOS
<code>/home/sosdemo/sosrc/</code>	Directory containing the sosdemo user’s presentation playlists

8. Manually copy the files you saved in step 1 & 2 back to SOS2

Put any files/data you saved in Step 1 back to the exact folder where they originally were on your new SOS2 installation.

If you backed your crontab up you can restore it by moving the file from Step 2 into the sos user's home directory and doing:

- `crontab ~/sos2_crontab.backup`

If you are getting an error message when you try to run SOS that mentions a keyfile is not found, try copying the keyfile that was backed up in Step 2 from wherever you stored it to:

- `/shared/sos/site-config/soskey.bin`

If that doesn't work, reach out to SOS Support and we can lend a hand.

9. Update your iPad app

Update your iPad's "SOS Remote" App to version 5.1.0 from the Apple Store. If your iPad is iOS version 9.1 or earlier you will need to update to the latest iOS version as well.

10. Switch to using SOS2 as your primary computer

You will need to switch the projectors from SOS1 to the graphics cards on SOS2. Depending on your site you may be able to switch this via a KVM. Otherwise you will need to unplug the projector cables from SOS1 and plug them into the corresponding port on SOS2.

11. Thoroughly test your SOS system

Make sure that everything is operating the way you would like it to be. There shouldn't be any differences from SOS1. There should be no missing content or differences in your SOS configuration.

Do not proceed with installing SOS1 until you are sure that SOS2 is working as expected with your SOS System!

If anything is not like it was on SOS1, let SOS Support know and we can help you fix it.

12. Once you are confident SOS2 is operating correctly, repeat these procedures with SOS1

Once you're confident SOS1 is working correctly, you're good to go!