This support document is intended for users with an active VMware vSphere license. If you do not have a VMware vSphere license, you will need to purchase one to operate NETLAB+ until our team releases a version utilizing Proxmox.

Data Transfer Utility Guide

Document Version: 2022-08-18

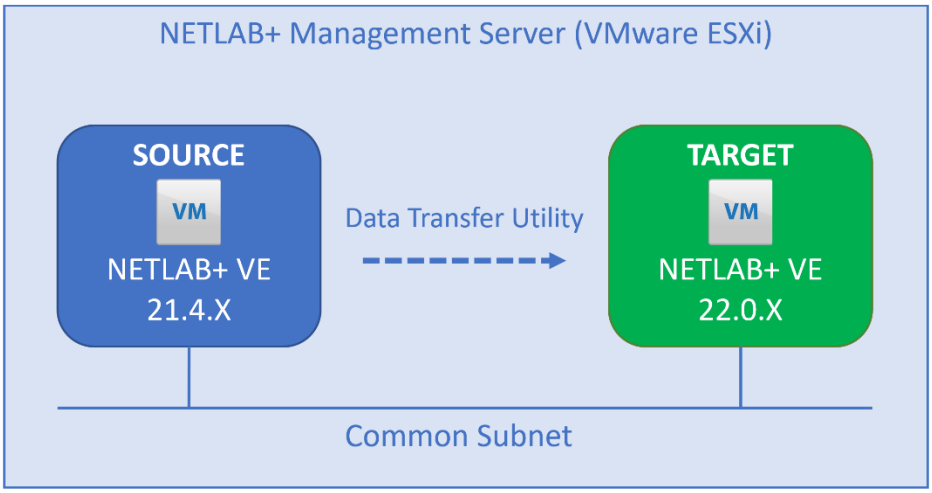
This guide provides details on the data transfer process required to migrate the data on a NETLAB+ 21.4.*X* version system to a NETLAB+ 22.*X.X* system.

Contents

Overview: Upgrading From NETLAB+ Version 21 to Version 22

In this guide, NDG provides details on the data transfer process required to migrate the data on your NETLAB+ 21.4.*X* version system to a NETLAB+ 22.*X.X* system.

From time to time, the operating system distribution (O/S) of the NETLAB+ virtual appliance must be upgraded to a new major version. NDG has found that it is not possible to reliably perform major O/S upgrades on a virtual appliance in a fully automated way. Therefore, NDG has developed a Data Transfer Utility which transfers data and settings over the network from one NETLAB+ virtual machine to another, running a newer O/S.



Upon successful transfer, the old virtual machine (SOURCE) is shut down, and the upgraded virtual machine (TARGET) becomes the production system.

What is Transferred

The following data and system settings are transferred from the SOURCE to the TARGET virtual machine.

- Hostname and IP settings.
- The entire NETLAB+ database, including communities, user accounts, pods, virtual machine inventory, reservations, lab history, and usage data.
- Custom pod and lab designs.
- All pod and lab content previously downloaded from NDG using the course manager.
- SSL certificates and private keys.
- Let's Encrypt account, if any.
- Customization settings such as logos and branding.
- IOS images for real equipment.

What is NOT Transferred

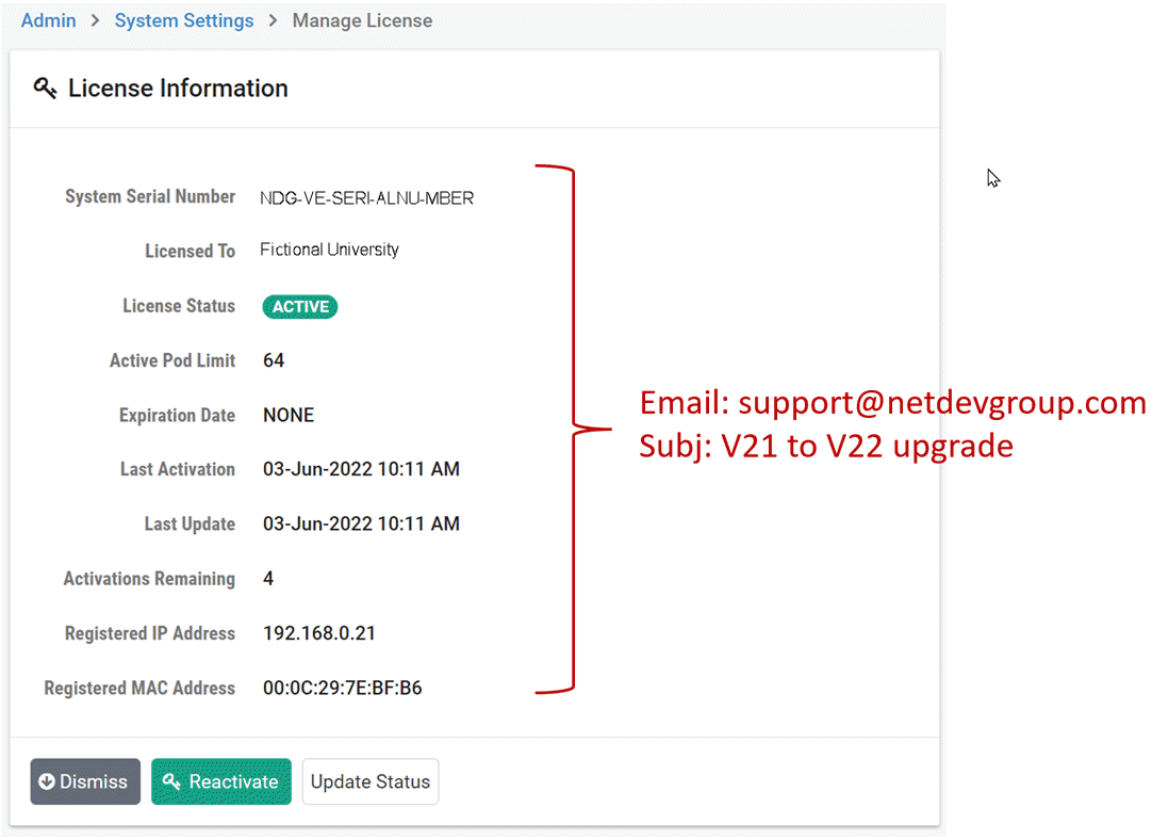
- Log data.

1 Preparing to Upgrade

The following steps are performed on the SOURCE system.

1. Log in to the web interface administrator account.
2. Verify that your NETLAB+ maintenance agreement is current.
3. Go to **Admin > System Settings > Manage License**. You will need to send your *System Serial Number* to NDG (instructions provided in a later step).

We recommend taking a screenshot of the *License Information* page of your system to send to NDG.



4. It is recommended that SSH be opened to the external IP address of the SOURCE system, in case you need assistance from NDG Support during the process.

The NETLAB+ built-in firewall only allows SSH from a specific NDG IP address, but if you would like to configure this source address in your site firewall, please email **support@netdevgroup.com**, subject: **SSH source address for NETLAB+ maintenance** and we will provide this address.

5. Send your screenshot showing the *System Serial Number* (or copy and paste the information) in an email to **support@netdevgroup.com**, subject: **V21 to V22 upgrade**.

Dear NETLAB+ Customer:

Thank you for sending your System Serial Number to NDG, as required, for the NETLAB+ Data Transfer Utility.

Here is the information you will need in order to perform the required upgrade to NETLAB+ version 22.1.X.

a. Link and password to download a virtual machine OVA file for the TARGET.
Link: https://example.com
Password: xxxxxxxxxx

b. Your license key in case reactivation is necessary.
License Key: xxxxxxxxxx

c. Confirmation that we can SSH to the IP address of SOURCE (recommended).
Confirmed.

You will receive a response via email from NDG with the following information, which will be needed in order to complete the steps in this guide.

- A link and password to download a virtual machine OVA file for the TARGET.
- Your license key in case reactivation is necessary.
- Confirmation that we can SSH to the IP address of SOURCE (recommended).

6. Obtain a temporary IP address for the TARGET virtual machine.

THE TEMPORARY IP ADDRESS ASSIGNED TO TARGET MUST BE ON THE SAME SUBNET AND VIRTUAL MACHINE NETWORK AS THE SOURCE. This is for security reasons and to prevent possible interference from firewall inspection.

After the upgrade, the TARGET machine will automatically be configured to use the IP address and networking configuration as the SOURCE, and the temporary address will no longer be used.

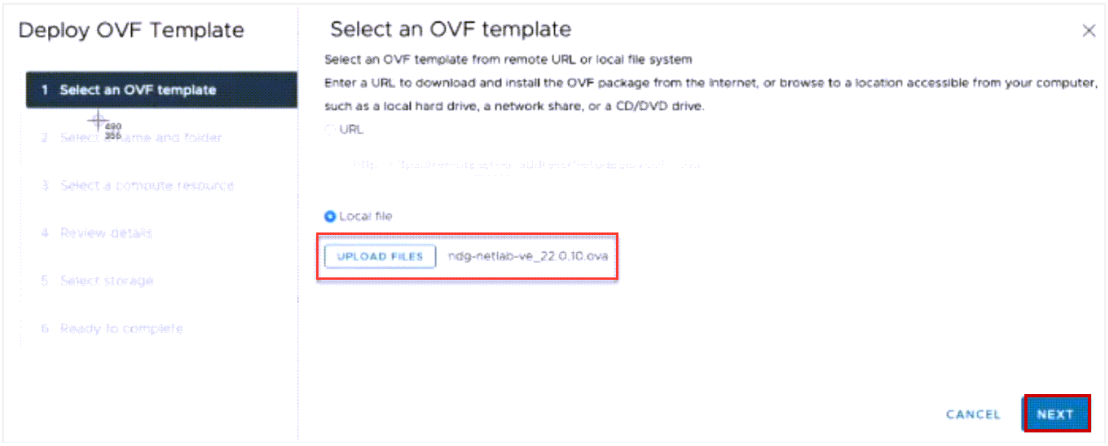
7. It is recommended that SSH be opened to the external IP address of the SOURCE machine in case support is required during the process.

1.1 Installing the TARGET Virtual Machine

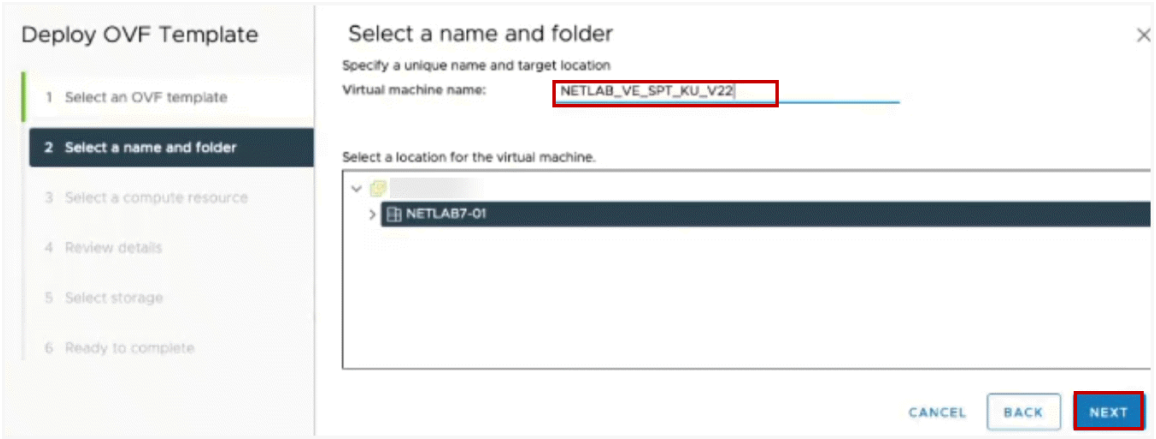
1. Download the OVA for the TARGET virtual machine using the link provided by NDG.

In the next steps, we'll deploy the OVA on your management server alongside the SOURCE virtual machine. For guidance, as you follow the steps below, please see the *Deploy to the VMware ESXi Management Server* section of the *NETLAB+ Installation Guide*.

2. Select the OVF template file to be uploaded and then click **Next**. The recommended name of the TARGET virtual machine is the SOURCE's name with "**_V22**" appended to the end.

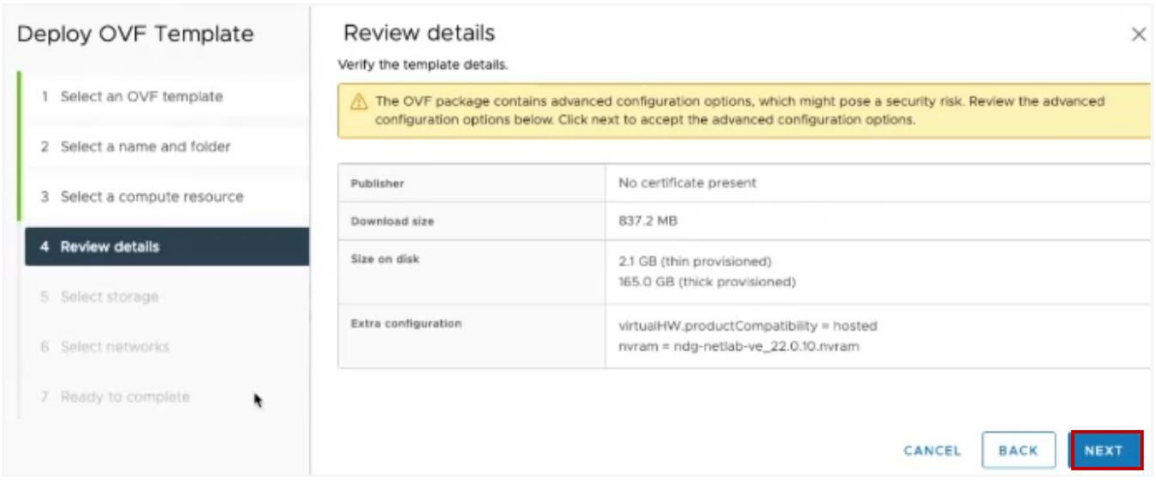


3. Select the folder, enter the name of the virtual machine (use the SOURCE's name with "**_V22**" appended) and then click **Next**.

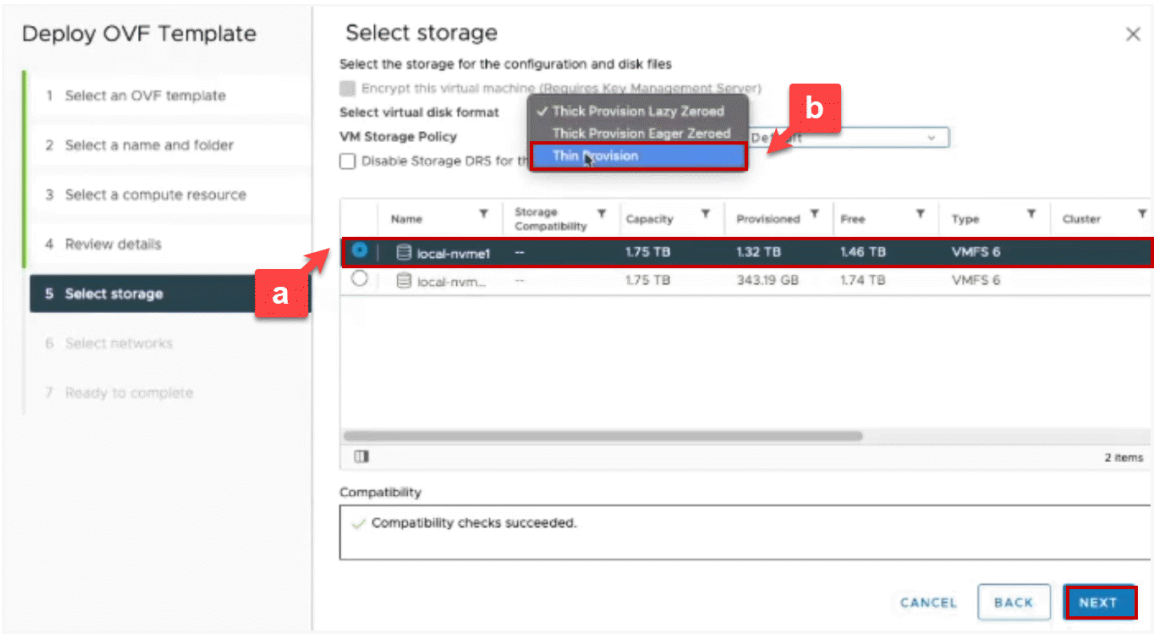


4. On the *Select a Compute Resource* page, a compatibility check will be performed; click **Next**.

5. Review the details displayed and then click **Next**.

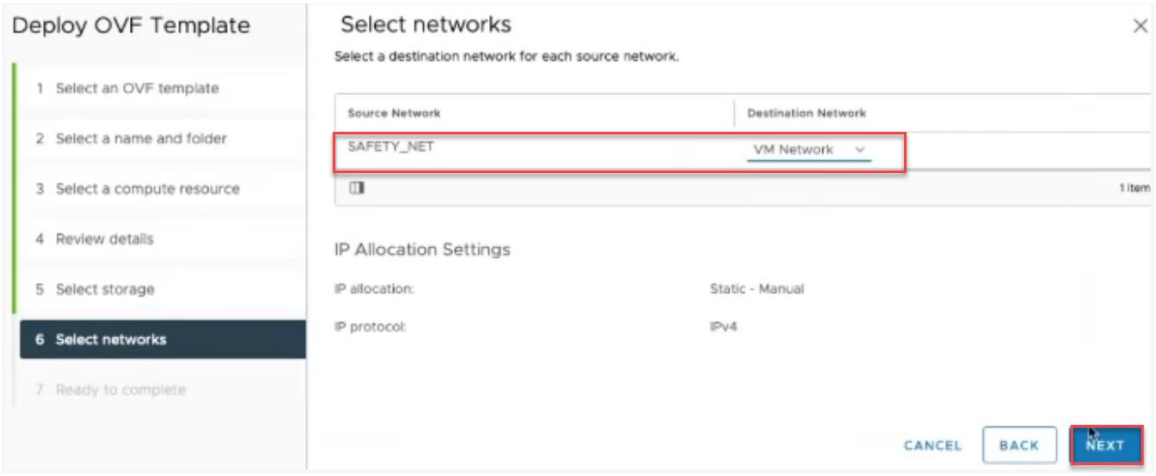


6. On the *Select storage* page, perform the following steps and then click **Next**.
   a. Select the datastore by clicking the radio button next to the datastore name.
   b. On the pull-down menu for *Select virtual disk format*, select **Thin Provision** (you must select the datastore first, as per the previous step, otherwise, the pull-down will reset).

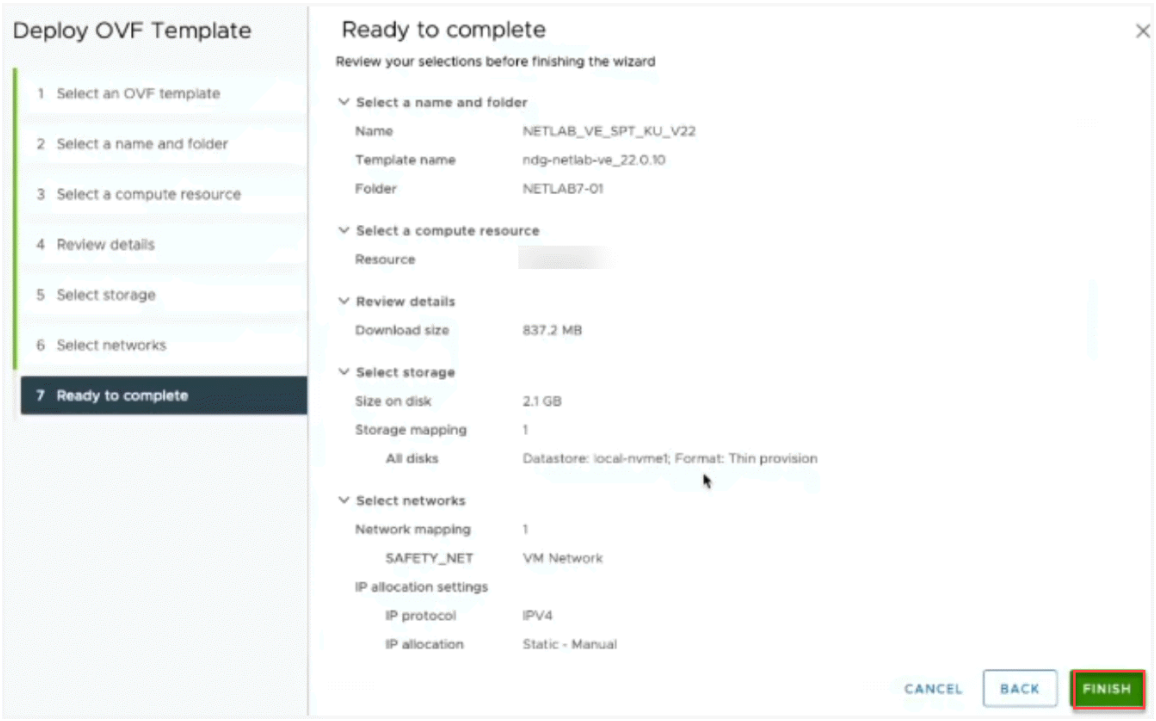


7. Edit TARGET's virtual machine settings and set the Network Adapter 1 network to match the SOURCE virtual machine. Click **Next**.

SOURCE and TARGET must be on the same VMware virtual network.



8. Review your selections and then click **Finish**.



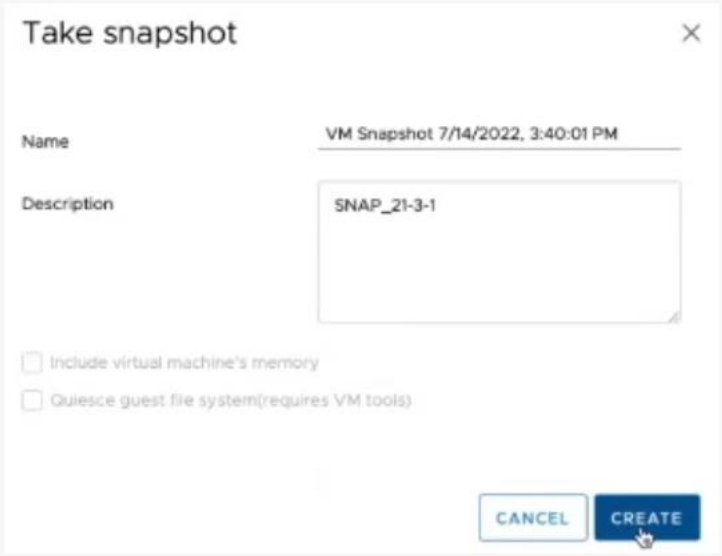
DO NOT POWER ON AT THIS TIME.

9. Take a virtual machine snapshot of TARGET while in the powered-off state.

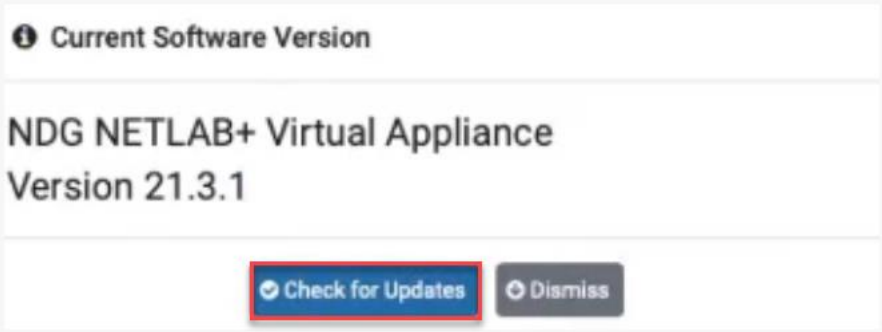
1.2 Upgrading the SOURCE Virtual Machine

By following the steps in this section, you will take two powered-down snapshots of your SOURCE virtual machine; one prior to performing a software update and then a second snapshot after the software update. These snapshots are necessary to have available should any problems arise during the transfer process.

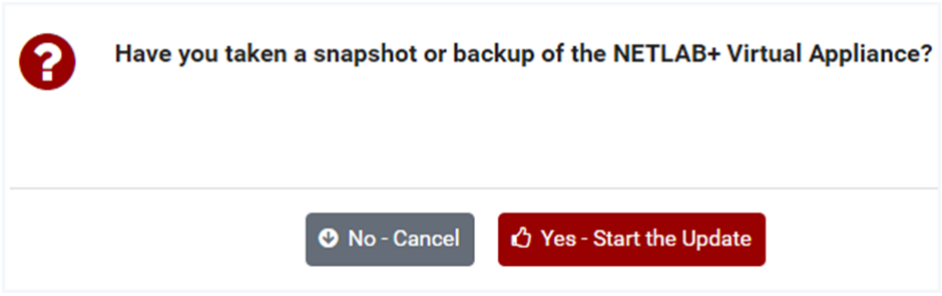
1. Backup or snapshot your SOURCE virtual machine in the same manner you would typically before a software upgrade.



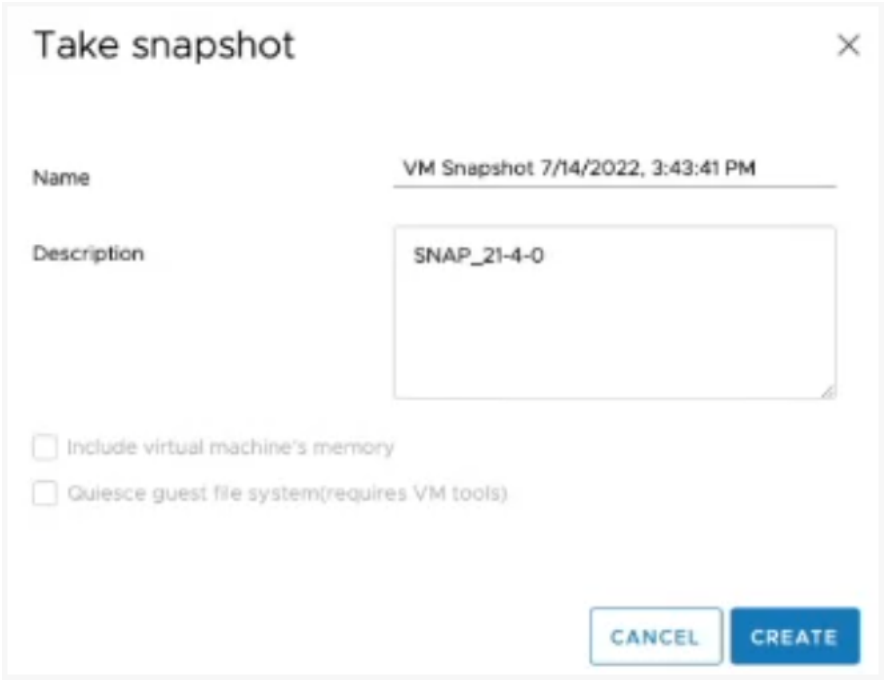
2. Power up the SOURCE system.
3. Initiate a software update on the SOURCE virtual machine by selecting **Software Updates > Check for Updates**.



4. As part of your data transfer request, NDG will enable the SOURCE virtual machine to upgrade to version **21.4.0** or later. Click **Yes – Start the Update**.



5. Verify the source system is now running version 21.4.0 or later.
6. Gracefully power down the SOURCE virtual machine.
7. Backup or snapshot your SOURCE virtual machine.



8. Power up the SOURCE system.

UPON SUCCESSFUL COMPLETION OF THE DATA TRANSFER, DO NOT REVERT THE SOURCE VM TO SNAPSHOT UNLESS ADVISED BY NDG. See the *Reverting Back to SOURCE* section for details.

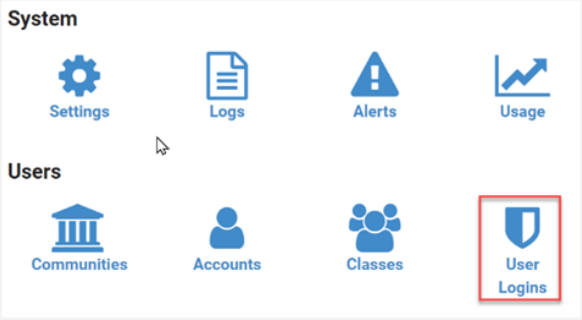
2 Performing the Data Transfer

In case technical support is required, it is highly recommended that you perform the data transfer during normal NDG support hours and that SSH access has been verified open between NDG and this NETLAB+ system.

Follow the steps below to transfer data from the SOURCE system to the TARGET system; the steps are labeled to indicate on which system to perform the action.

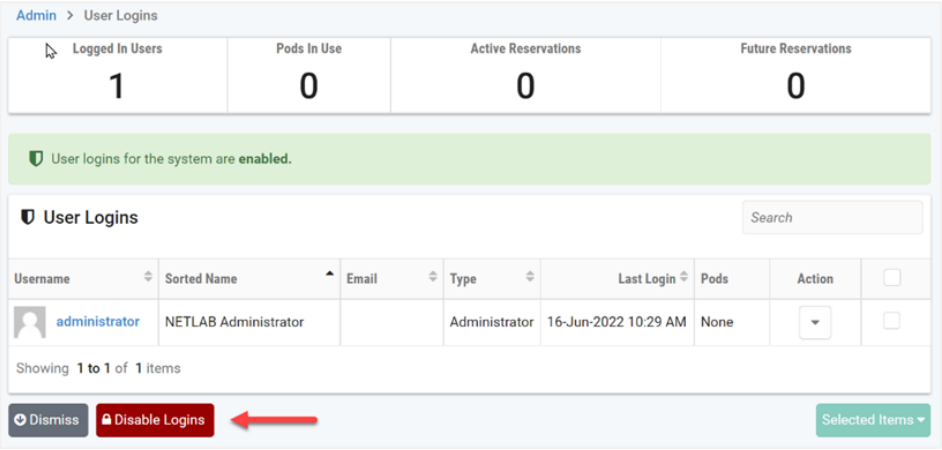
- **SOURCE**: Perform the action on the SOURCE system.
- **TARGET**: Perform the action on the TARGET system.

1. SOURCE: Log in as **administrator** to the SOURCE system web interface. Navigate to **Admin > User Logins**.



2. SOURCE: Ensure there are no logged-in users (other than the administrator). It is advised that you **Disable Logins** at this time. The transfer process will also disable web logins.

The data transfer process will not proceed if there are users logged into the web interface.

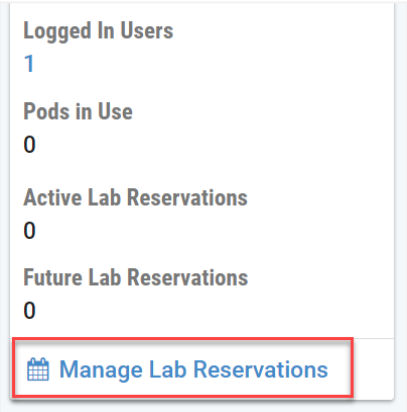


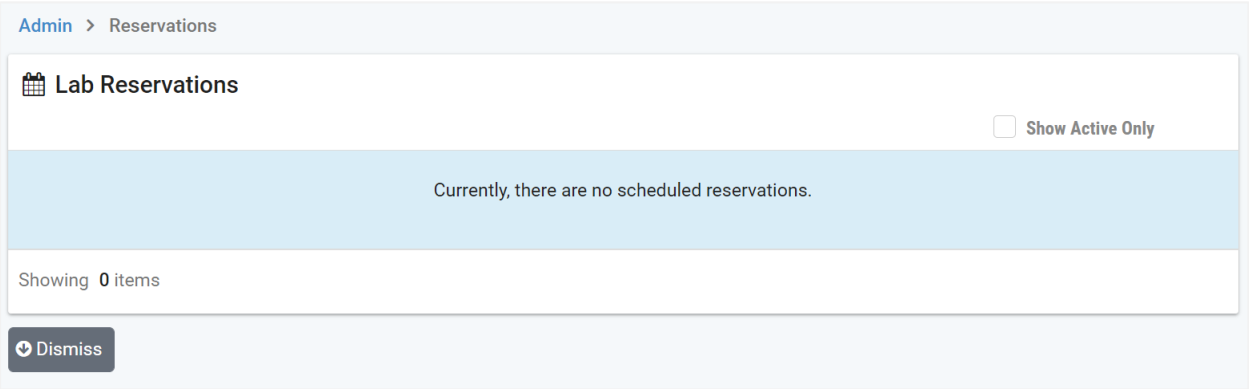
3. SOURCE: Ensure that there are no pods in use. Take pods offline if necessary.

The data transfer process will not proceed if there are pods in use.

4. SOURCE: Examine the information in the system status panel on the administrator home page. Ensure that there are no future near-term reservations that are scheduled to become active during the transfer process. Select **Manage Lab Reservations** and delete reservations, if necessary.

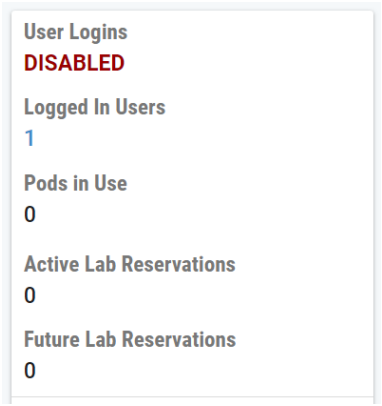
Please allow for at least a **two-hour** window with no active lab reservations to ensure adequate time to complete the transfer process.



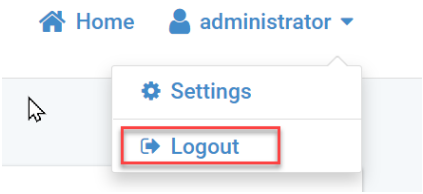


5. SOURCE: Double-check the system status panel to confirm that there is nothing that will prevent the data transfer. It's OK if there are future lab reservations as long as they are not scheduled to run during the time that the upgrade is in progress.

The number of Logged In Users should indicate **1**. This value will become zero after you log out of the administrator interface.



6. SOURCE: Log out of the administrator web interface.



7. Log in to the VMware vCenter VCSA on your management server.

The data transfer process is performed from the virtual machine consoles for both SOURCE and TARGET systems. Therefore, you must have access to the VMware vCenter VCSA of your NETLAB+ management server.

8. SOURCE: Open a VMware Console to the SOURCE virtual machine and log in to the NETLAB+ system console using your administrator password.

9. SOURCE: From the *Console Main Menu*, enter **T** to transfer data to the upgraded NETLAB+ VM.

> If you do not see the Transfer Data [T] option, the SOURCE system is not running 21.4.0 or later and must be software upgraded first.

SOURCE SYSTEM

```
NDG NETLAB+ VE 21.4.0

--- Console Main Menu ---

[P] Change Administrator Password
[I] IP Settings
[D] Disk Maintenance
[T] Transfer Data to Upgraded NETLAB+ VM
[S] Shutdown
[R] Reboot
[L] Logout

:
```

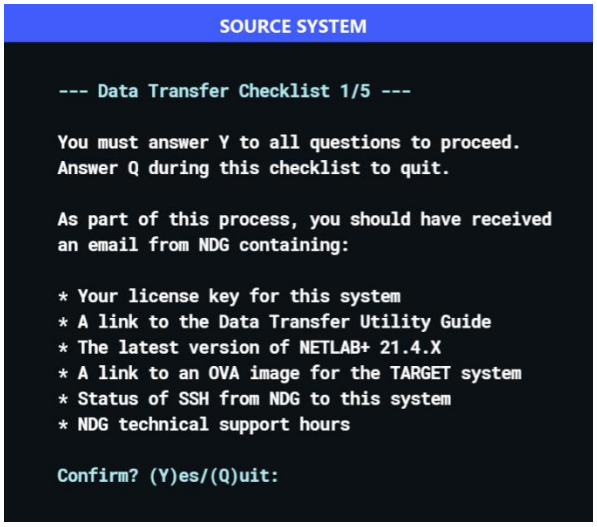
10. SOURCE: Confirm that you wish to continue with the transfer. Press **Y** to proceed or **Q** to quit.

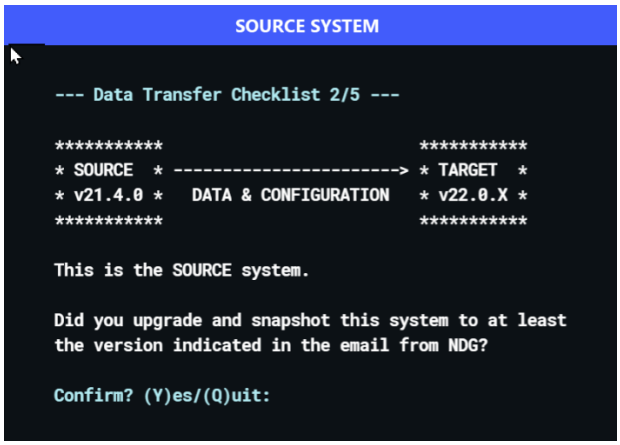
> The source system should indicate *eligibility confirmed*; press **any key** to continue**.** If your system shows an error instead, please [contact NDG Support](#).

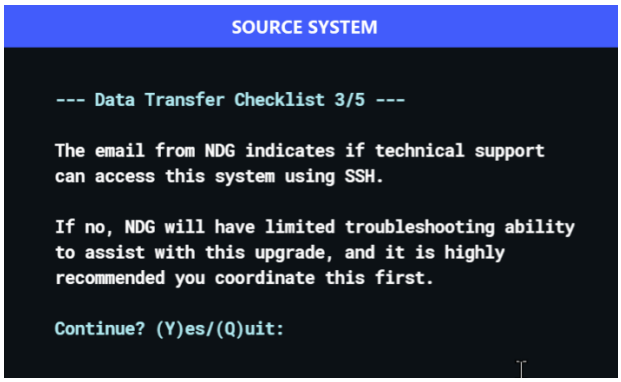
SOURCE SYSTEM

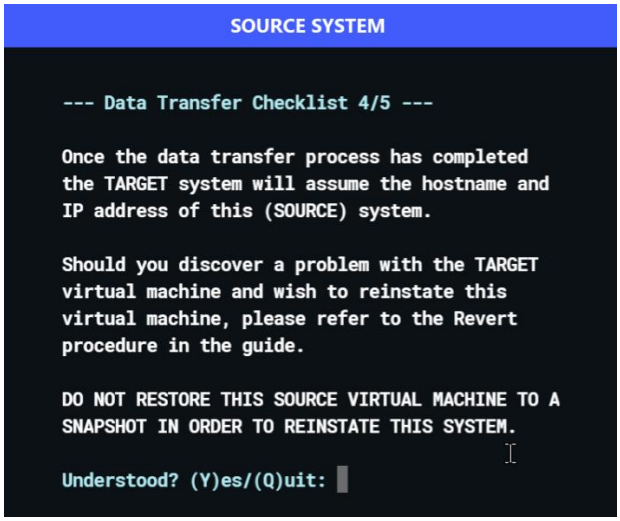
```
--- Data Transfer Utility ---

This utility transfers data from this NETLAB+
to an upgraded NETLAB+ virtual machine.

Please review the Data Transfer Utility Guide.
It contains more detailed information than the
on-screen help.

In case technical support is required, it is highly
recommended that you perform this upgrade during
normal NDG support hours and that SSH access has
has been verified by NDG.

Continue transfer? (Y)es/(Q)uit: y
*** checking upgrade eligibility
*** eligibility confirmed
Press any key to continue...
```

11. SOURCE: Complete the checklist items. Press **Y** to proceed or **Q** to quit for each item.



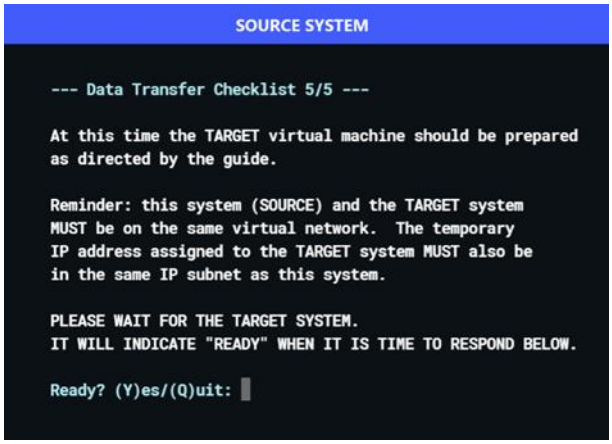






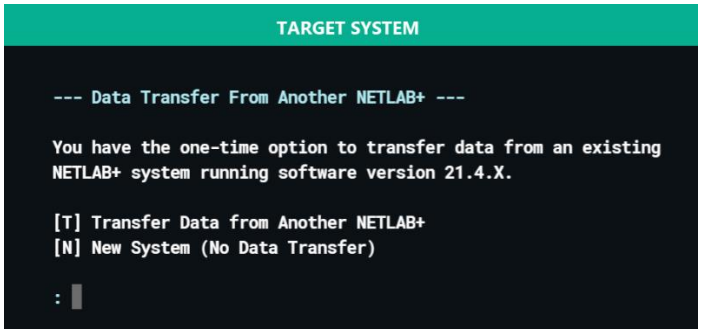
12. SOURCE: The final checklist item waits for the TARGET system to be prepared.

Do not respond with **Y** until you have completed the TARGET preparation as outlined in the next steps.

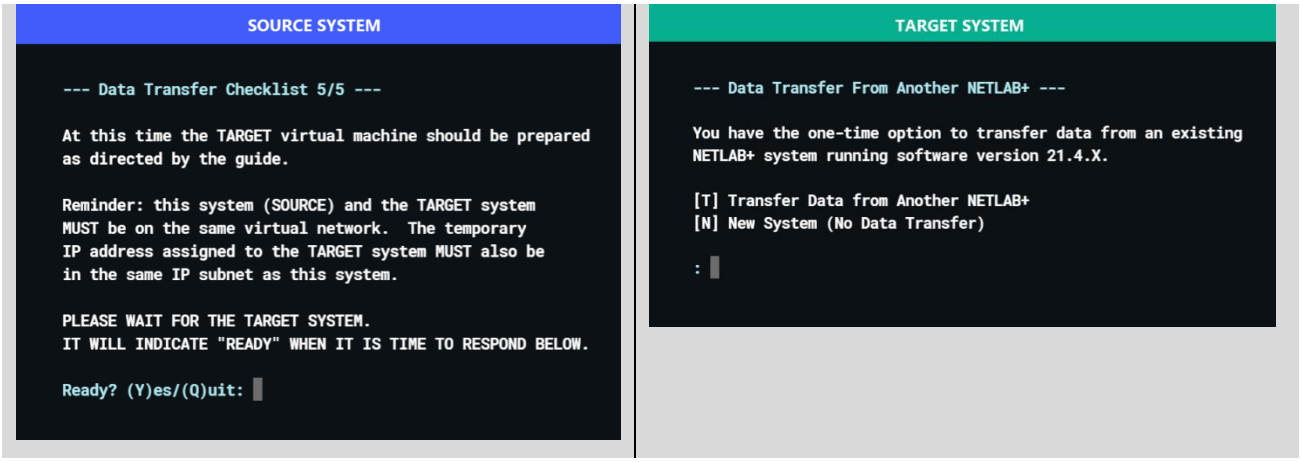


13. TARGET: Power on the TARGET virtual machine.
14. TARGET: Open a VMware Console to the TARGET virtual machine and log in to the NETLAB+ system console using the default administrator password: **`netlab`**
15. TARGET: After login, verify that the following menu appears.

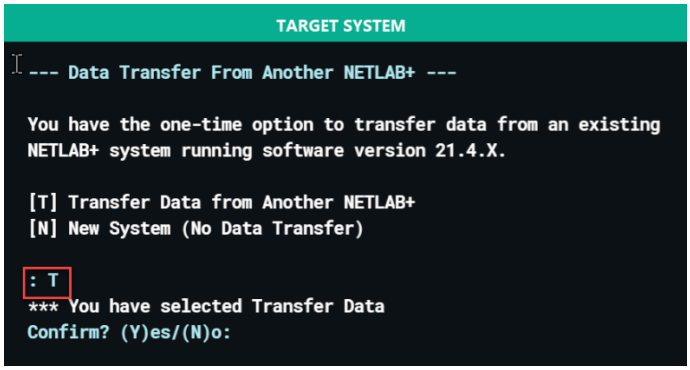
If you do not see this menu, the OVA is not the correct version. **In order to accept the data transfer, you must be running NETLAB+ version 22.0.*X*.** The use of this version is necessary to preserve compatibility during the transfer process. Versions of NETLAB+ 22.1.*X* and later will not accept a data transfer.



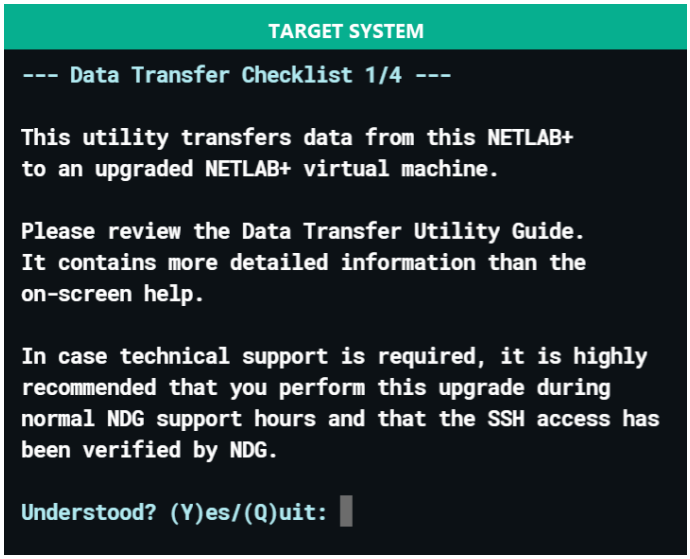
TIP: Arrange the virtual machine consoles side-by-side on your screen so that the SOURCE is on the left, and the TARGET is on the right.

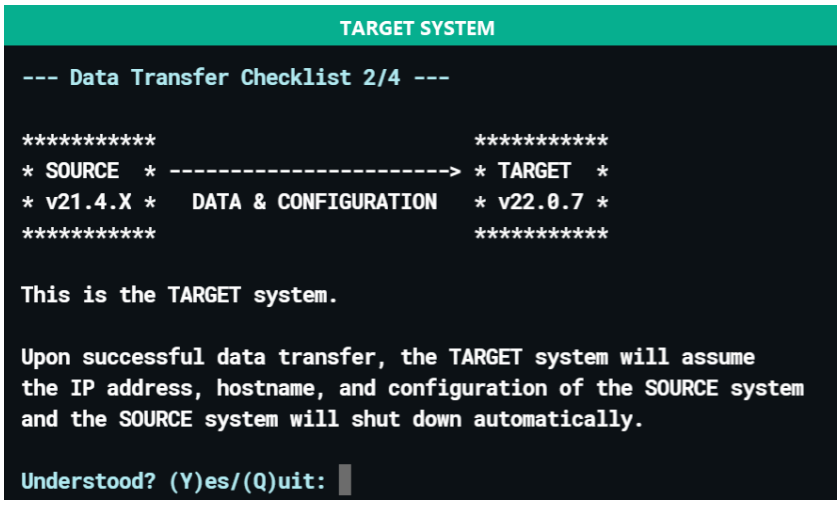


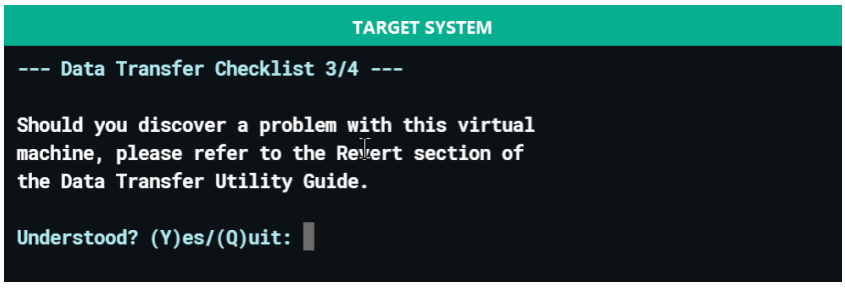
16. TARGET: Enter **T** to transfer data from another NETLAB**+,** and then enter **Y** to confirm.

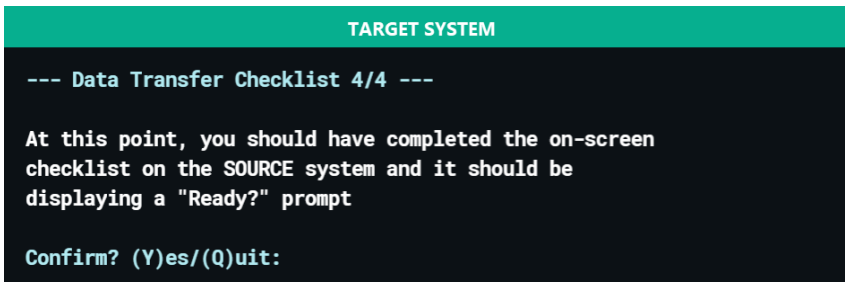


17. TARGET: Complete the TARGET checklist items. Press **Y** to proceed or **Q** to quit for each item.









18. TARGET: Enter the *Temporary Target IP address* for the TARGET system. This IP address is only used during the transfer process. Upon successful transfer, the TARGET system is reconfigured to use the SOURCE's IP address.

The temporary TARGET IP address must be on the same subnet as the subnet as SOURCE.

In the following example, the SOURCE address is 192.168.0.21 and the temporary TARGET address is 192.168.0.23. The subnet mask is 255.255.255.0 (/24) on both systems. Upon successful transfer, the TARGET virtual machine is reconfigured to use 192.168.0.21 and the SOURCE virtual machine is permanently shut down.

TARGET SYSTEM

```
--- Target System Temporary IP Settings ---

***********                          ***********
* SOURCE  * ----------------------> * TARGET  *
* v21.4.X *   DATA & CONFIGURATION   * v22.0.7 *
***********                          ***********

Please enter a temporary IP address and subnet mask
for this TARGET system.

THE TARGET IP MUST BE ON THE SAME SUBNET AS THE SOURCE SYSTEM !

Upon successful data transfer is complete, this system will
assume the IP address of the SOURCE system and the temporary
IP address will no longer be used.

Enter Q to quit and start over.

Temporary TARGET IP address (or Q): 192.168.0.23
Subnet mask (or Q): 255.255.255.0
```


19. TARGET: The TARGET system is now ready to receive a data transfer and waits for the SOURCE system to connect.

The **security passcode** shown on this screen will be entered on the SOURCE system.

TARGET SYSTEM

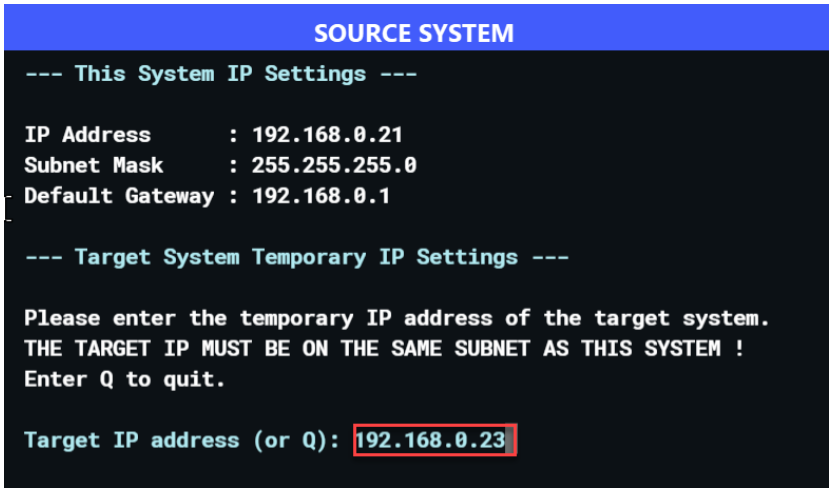
```
--- Start Transfer on SOURCE System ---

***********                           ***********
* SOURCE  * ----------------------> * TARGET  *
* v21.4.X *   DATA & CONFIGURATION   * v22.0.7 *
***********                           ***********

Please perform the following steps on the SOURCE system:

1. Enter Y at the "Ready" prompt.
2. Enter the temporary TARGET IP address: 192.168.0.23
3. Enter this security passcode: NLF5896

Waiting for SOURCE system to connect.
Press Q to Quit (abort the data transfer)
```

20. SOURCE: Enter **Y** for *Ready* on the SOURCE system final checklist item.

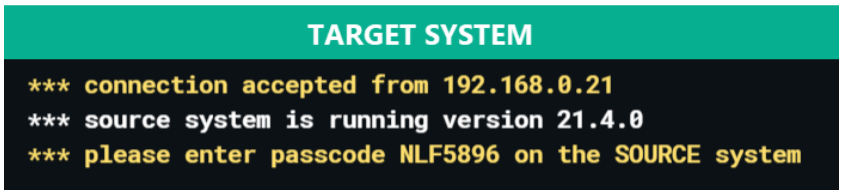
SOURCE SYSTEM

```
--- Data Transfer Checklist 5/5 ---

At this time the TARGET virtual machine should be prepared
as directed by the guide.

Reminder: this system (SOURCE) and the TARGET system
MUST be on the same virtual network.  The temporary
IP address assigned to the TARGET system MUST also be
in the same IP subnet as this system.

PLEASE WAIT FOR THE TARGET SYSTEM.
IT WILL INDICATE "READY" WHEN IT IS TIME TO RESPOND BELOW.

Ready? (Y)es/(Q)uit:  Y
```


21. SOURCE: Enter the *temporary IP address* of the TARGET system.



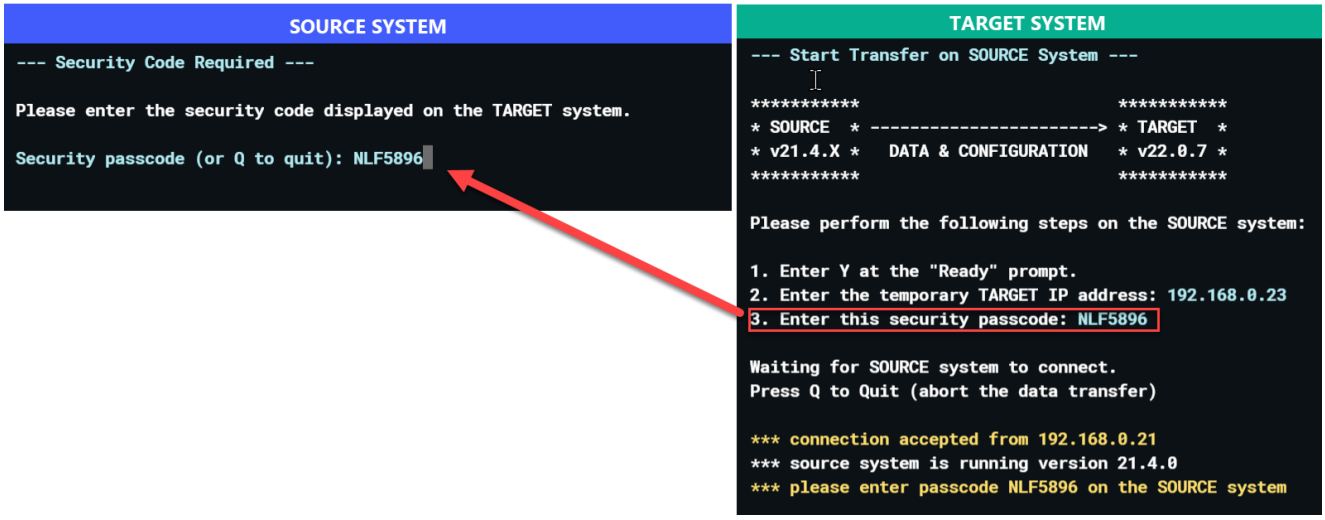
The SOURCE system will now attempt a connection to TARGET. On success, the TARGET will display:



If the SOURCE system fails to connect to the TARGET system, please double-check the following and try again:

1. The temporary TARGET IP address was entered correctly on the SOURCE system.
2. Network Adapter 1 on both the SOURCE and TARGET systems must be set to the same virtual network in vCenter. You may change this setting in vSphere without shutting down the TARGET.

22. SOURCE: Upon successful connection, the SOURCE will prompt for the security key. Enter the *Security passcode* provided by the TARGET system.



23. Once the key is entered correctly into the SOURCE system, the transfer will begin. Both systems will display progress.

PLEASE DO NOT INTERRUPT THE TRANSFER PROCESS.

24. SOURCE: Upon successful completion of the data transfer, the SOURCE system will shut down automatically.

SOURCE SYSTEM

```
*** transfer to TARGET system is now complete
*** sending upgrade report to NDG
*** this system will shut down in 5 seconds
```

Since the TARGET system now has the same IP address as SOURCE, do not power on the SOURCE system as this will result in duplicate IP addresses on the network.

Please see the *Reverting Back to SOURCE* section later in this guide if you want to reactivate the SOURCE system. **Please DO NOT revert to snapshot taken on the SOURCE unless directed by NDG,** as NDG is now tracking the new virtual machine and software version.

25. TARGET: Upon successful completion of the data transfer, the TARGET system will display the following messages.

TARGET SYSTEM

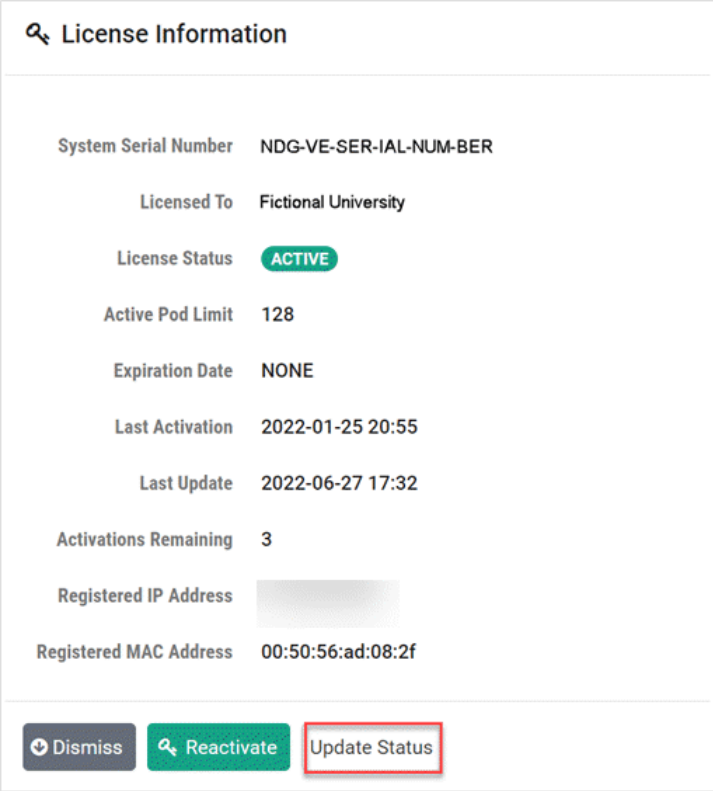
```
*** restoring database from client
*** installing transferred files
*** configuring hostname from SOURCE (ve21.netdevgroup.com)
*** configuring outside IP address from SOURCE (192.168.0.21)
*** configuring inside IP address from SOURCE (169.254.1.1)
*** configuring DNS servers from SOURCE
*** configuring logging
*** configuring firewall
*** waiting for SOURCE to shut down
*** SOURCE is still up (1)
*** data transfer is complete
*** SOURCE system has shut down
*** TARGET system will now reboot and become the new server
*** use the administrator password from SOURCE system
Press any key to continue...
```

26. Press **any key** to continue, and the TARGET system will reboot.

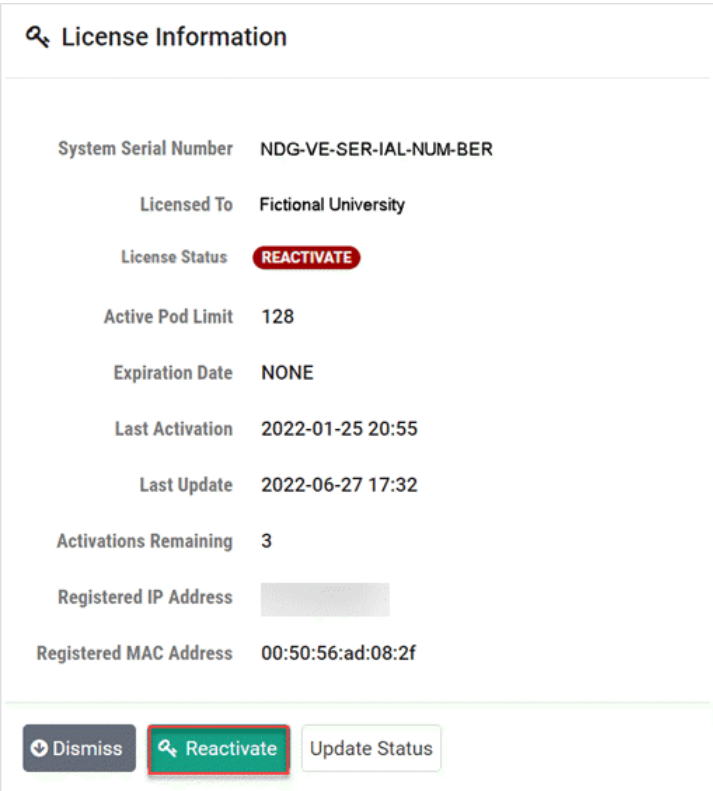
The TARGET system now has the same hostname and IP address as the original SOURCE. After reboot, you can log in using the web interface using the **administrator** account. Note that administrator password of TARGET is now the same as SOURCE for both web interface and system console.

27. Log in to the web interface as **administrator** and perform a normal software upgrade.

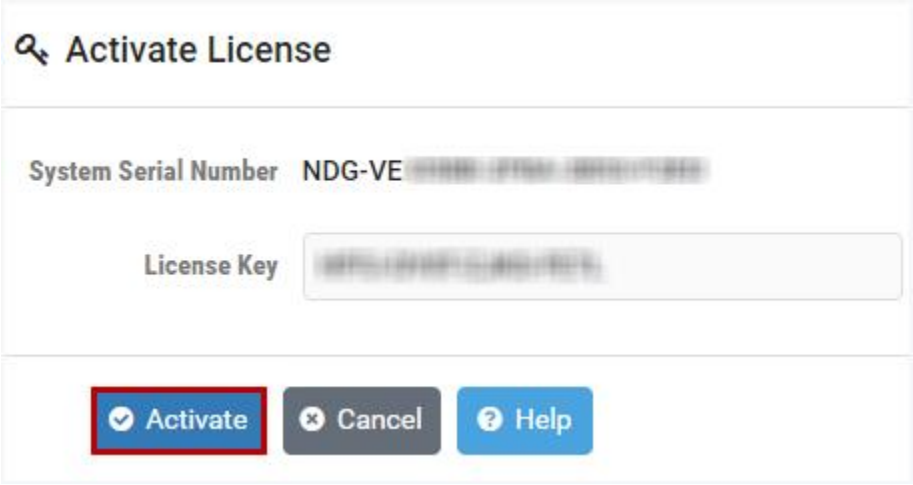
28. It will be necessary to check the status of your system's license. Go to **Admin > System Settings > Manage License** and click **Update Status**.



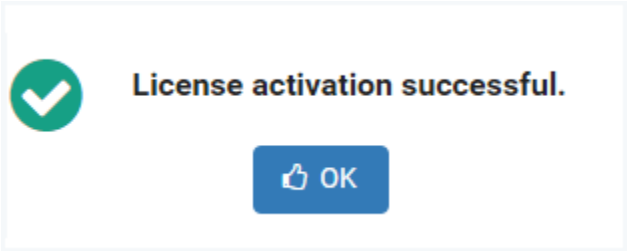
29. If the license status does not indicate *Active,* it will be necessary to reactivate your license by clicking **Reactivate**.



30. The *Activate License* page will be displayed. Enter the **License Key** provided by NDG. Select **Activate**.



31. A message will display, indicating the license activation was successful. Select **OK.**



3 Verifying the TARGET System

Upon reboot, the TARGET system will have normal user logins disabled. Before enabling user logins, please log into the web interface using the **administrator** account and verify the following items have transferred correctly.

- Hostname and IP settings.
- SSL certificate(s) or Let's Encrypt configuration.
- Communities, user accounts, pods, virtual machine inventory, reservations, lab history, and usage data.
- Custom pod and lab designs.
- All pod and lab content that was previously downloaded from NDG using the course manager.
- Customization settings such as logos and branding.
- IOS images for real equipment.

If you are satisfied with the transfer, please complete the following items:

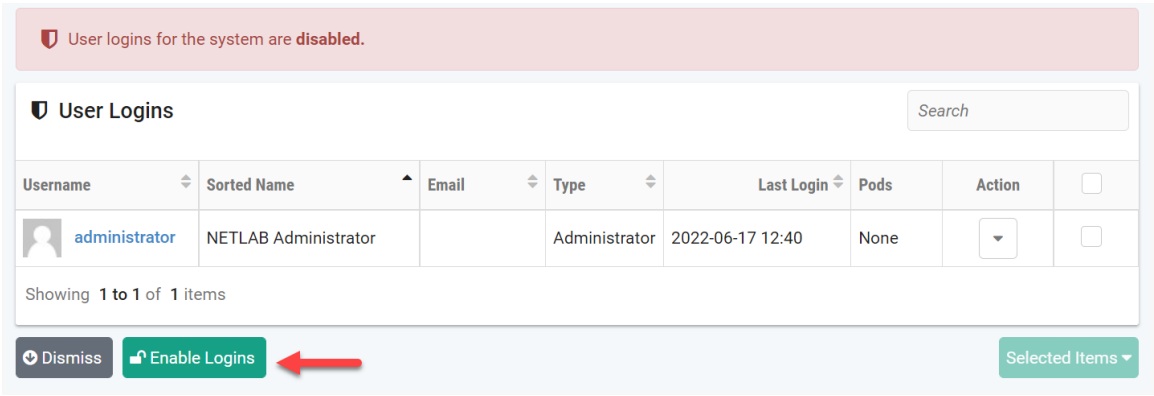
1. Verify the settings for network adapters and adjust as needed to the values shown in the table below.

Network Adapter	Name	Connect at power on - checkbox
Network Adapter 1	NETLAB_LAN_1	checked
Network Adapter 2	NETLAB_LAN_2	checked
Network Adapter 3	SAFETY_NET	checked
Network Adapter 4	SAFETY_NET	checked

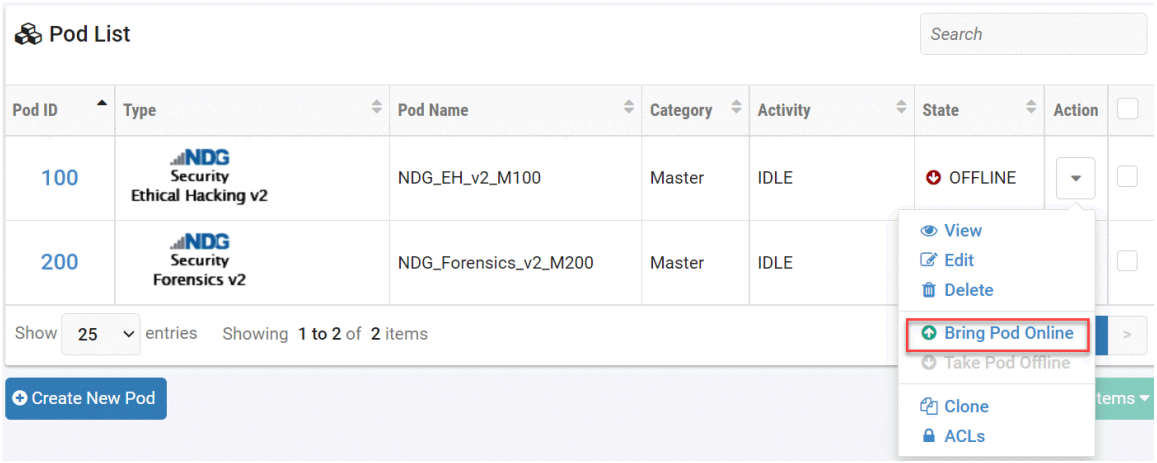
Network Adapter 1 is the primary network adapter, which connects to your campus LAN. The default name used by VMware for this adapter is **Management Network**, as shown in the *Verifying vSwitch0 Configuration* section of the *Remote PC Guide Series - Volume 2, Installation*. We recommend renaming the adapter to **NETLAB_LAN_1**.

Network Adapter 2 is used in setups that include physical lab devices. Please refer to the *NETLAB+ VE Real Equipment Pod Installation Guide for Cisco Networking Academy*.

2. To re-enable user logins, go to **Admin > User Logins** and select **Enable Logins**.



3. To bring pods back online, go to **Admin > Pods** and, for each pod, select the *Action* **Bring Pod Online.**



4. Test your pods by performing a few test lab reservations to verify your NETLAB+ system is performing as expected.

If you find a problem with the transfer, please see the *Troubleshooting* section.

4 Finalizing the Transfer

If you have determined that all is well, you should perform the following steps on the **SOURCE** virtual machine in vCenter to prevent possible conflicts in the future.

1. Make sure the SOURCE virtual machine is powered off.
2. Ensure that the SOURCE virtual machine is removed from vSphere automatic startup so that it does not power on automatically after the management server reboots.
3. Place Network Adapter 1 of the SOURCE system on an isolated network (i.e., SAFETY_NET) to prevent duplicate IP addresses should the SOURCE system be powered on.

5 Troubleshooting

If you receive an error before the data transfer process completes, on either SOURCE or TARGET, please take a screenshot of the error and contact NDG Support.

- If the data transfer process fails **BEFORE** completion, you may simply power down the TARGET system and restart the SOURCE system.

- If you determine that the process has somehow failed **AFTER** "data transfer is complete" appears on the TARGET, please refer to the *Reverting Back to SOURCE* section.

Please DO NOT revert the SOURCE virtual machine back to a snapshot unless directed by NDG.

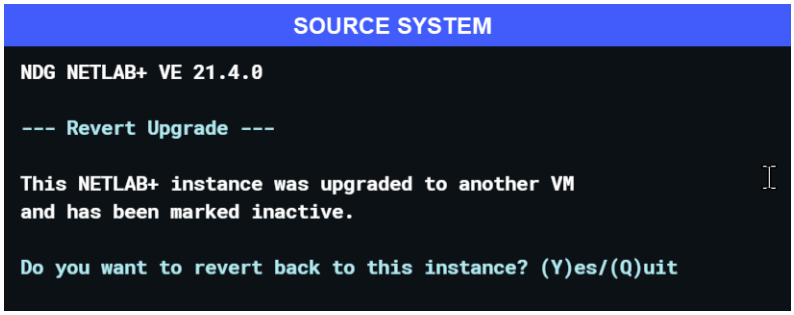
6 Reverting Back to SOURCE

If you want to revert back to the SOURCE virtual machine AFTER “data transfer is complete” appears on the TARGET, please perform the following steps:

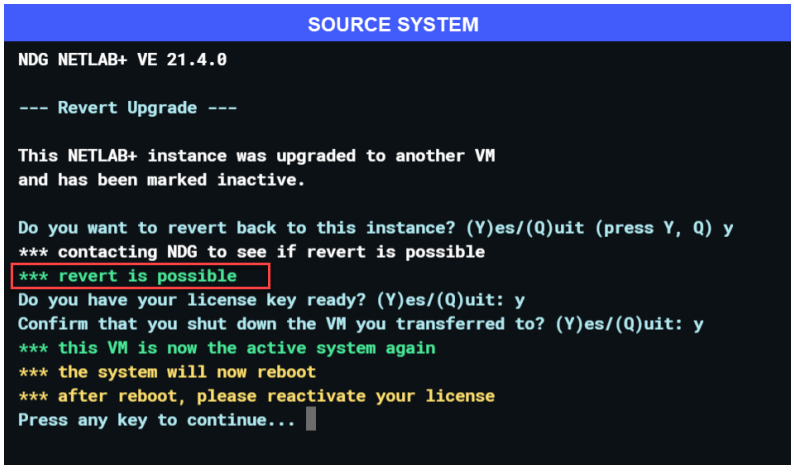
1. Make sure you have your license key available, as it will be needed later.
2. TARGET: Power OFF the TARGET virtual machine and disable auto-starting on the management server (if configured).
3. SOURCE: If you moved the SOURCE virtual machine to SAFETY_NET, please configure Network Adapter 1 back to the original production network.

Outbound internet connectivity from the SOURCE virtual machine to NDG must be available to complete the revert process.

4. SOURCE: Power ON the SOURCE virtual machine.
5. In vCenter, open a console to the SOURCE virtual machine. Assuming the data transfer did complete, the following menu SHOULD appear:



6. Answer **Y** at the prompt to proceed.
7. SOURCE: The system will contact NDG to confirm that a revert is possible. If you see a message indicating *revert is possible*, answer **Y** to the subsequent prompts.



If you receive an **E_TIMEOUT** error, the SOURCE system was unable to connect to NDG. Please verify that the SOURCE virtual machine Network Adapter 1 is set back to the production network and retry.

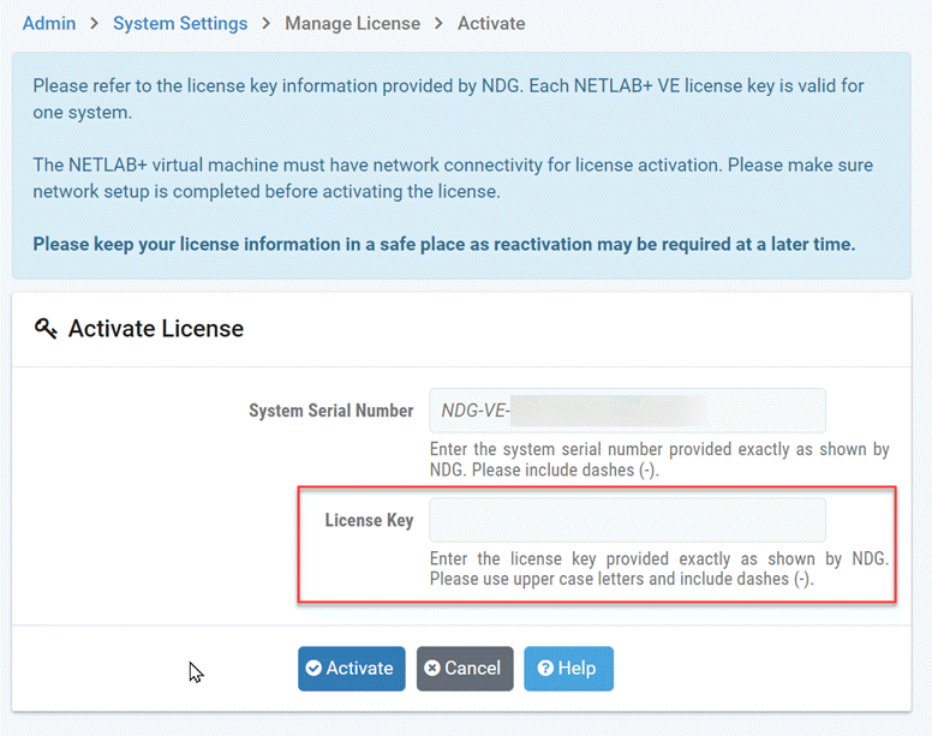
SOURCE SYSTEM

```
NDG NETLAB+ VE 21.4.0

--- Revert Upgrade ---

This NETLAB+ instance was upgraded to another VM
and has been marked inactive.

Do you want to revert back to this instance? (Y)es/(Q)uit y
*** contacting NDG to see if revert is possible
!!! E_TIMEOUT, the request did not complete within the allotted time period, 500,
down or too slow
!!! revert failed
```

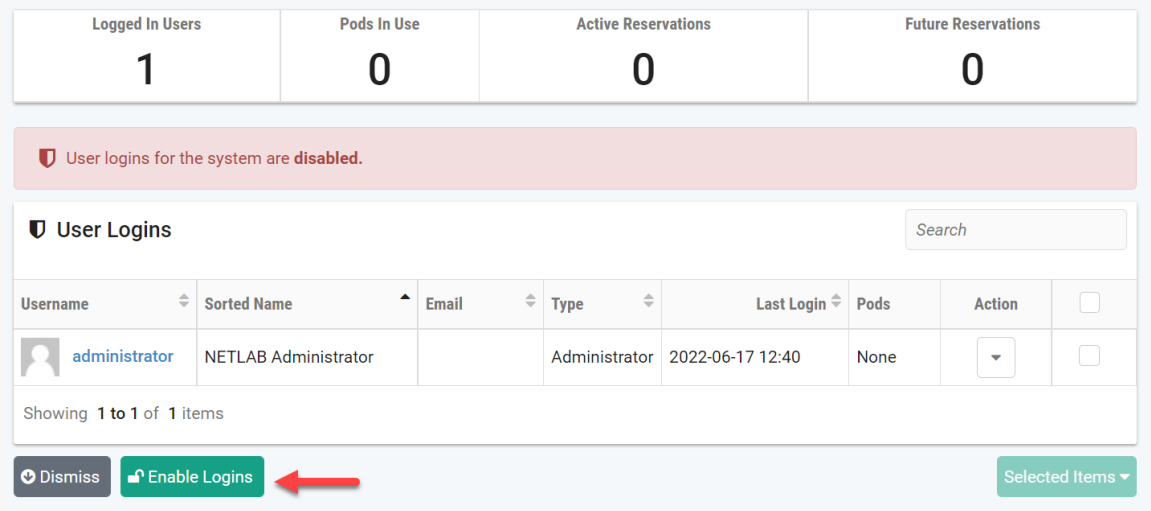
Should you receive any other errors, please contact NDG Support for assistance.

8. SOURCE: After the SOURCE system has reverted and rebooted, please log in to the web interface using the **administrator** account.

9. SOURCE: The system may require that you reactivate your license. If so, go to **System Settings > Manage License > Activate**. Enter your *License Key* and click **Activate**.



10. SOURCE: Go to **Admin > User Logins** and select **Enable Logins**.



11. Please contact NDG with any concerns or feedback you have about the transfer process. Please let us know why you found it necessary to revert.