



Student Guide

Document Version: **2020-12-09**



This guide documents features available in **NETLAB+ VE version 20.5.0** and later.

Copyright © 2020 Network Development Group, Inc.
www.netdevgroup.com

NETLAB+ is a registered trademark of Network Development Group, Inc.

VMware is a registered trademark of VMware, Inc. Cisco, IOS, Cisco IOS, Networking Academy, CCNA, and CCNP are registered trademarks of Cisco Systems, Inc.

Contents

Introduction	3
1 Initial Login.....	4
1.1 Change Password During Initial Login.....	5
1.2 Change E-mail Address During Initial Login	8
1.3 Change Date and Time Settings During Initial Login.....	8
2 MyNETLAB Interface.....	10
2.1 Modify User Settings.....	10
2.1.1 Change Password.....	12
2.1.2 Change E-mail	13
2.1.3 Change Date and Time Settings.....	13
2.2 Logout.....	15
3 Schedule Lab Reservations	16
3.1 Schedule a Lab for Yourself or for Your Team	17
3.2 Select a Class	18
3.3 See a List of Labs	19
3.4 Preview Lab Content	19
3.5 Enter the Pod Scheduler.....	21
3.6 Explore Pod Scheduler Features	22
3.7 Select a Reservation Time	23
3.8 See the Lab Reservation Displayed on the MyNETLAB Page	26
4 Enter a Lab Session	27
4.1 Explore the Tabbed Sections of the Lab Access Interface	28
4.1.1 Topology Tab.....	29
4.1.2 Content Tab.....	30
4.1.3 Status Tab.....	33
4.2 Access a Device	34
4.2.1 Copy Selected Text.....	36
4.2.2 Paste to Terminal	37
4.2.3 Undock and Dock Device Windows	40
4.2.4 Password Recovery	42
4.2.5 Terminal Settings	44
4.3 Pod-wide Device Automation	48
4.4 Screenshots of Remote PCs.....	49
4.5 Display Sizing Options for Remote PCs	51
4.6 Extend a Reservation.....	52
4.7 Switch to a Different Lab Exercise.....	54
4.8 End a Reservation.....	55
5 View Completed Labs.....	57
5.1.1 Lab History and Screenshots.....	59
6 Manage Configuration Files	63
6.1 Configuration File Management Outside of a Lab Reservation.....	63
6.1.1 Viewing and Editing Configuration Files	65
6.1.2 Creating Folders and Files.....	66
6.1.3 Deleting Folders and Files.....	68
6.1.4 Configuration History.....	68
6.2 Configuration File Usage During Lab Reservations	71

6.2.1	Saving Configuration Files During a Lab Reservation	72
6.2.2	Loading Configuration Files During a Lab Reservation	73
6.2.3	Erasing the Configuration on a Device During a Lab Reservation	82

Introduction

This is the *NETLAB+ Student Guide* for the virtual edition of NETLAB+. The first section will take you through the initial login process, including changing your initial password and your user settings.

We will also take a look at the MyNETLAB interface and how to make changes to the user settings made during your initial login.

Step-by-step instructions for scheduling a lab reservation are provided. We will show you how to access the scheduling feature on the MyNETLAB page, select a lab from the lab listing, and the features of the Pod Scheduler.

Finally, we will explore the lab access interface and provide guidance on performing a lab session and accessing lab devices.






1 Initial Login



Your instructor or NETLAB+ Administrator will provide you with the URL or IP address of the NETLAB+ system you will use, along with a username and password.

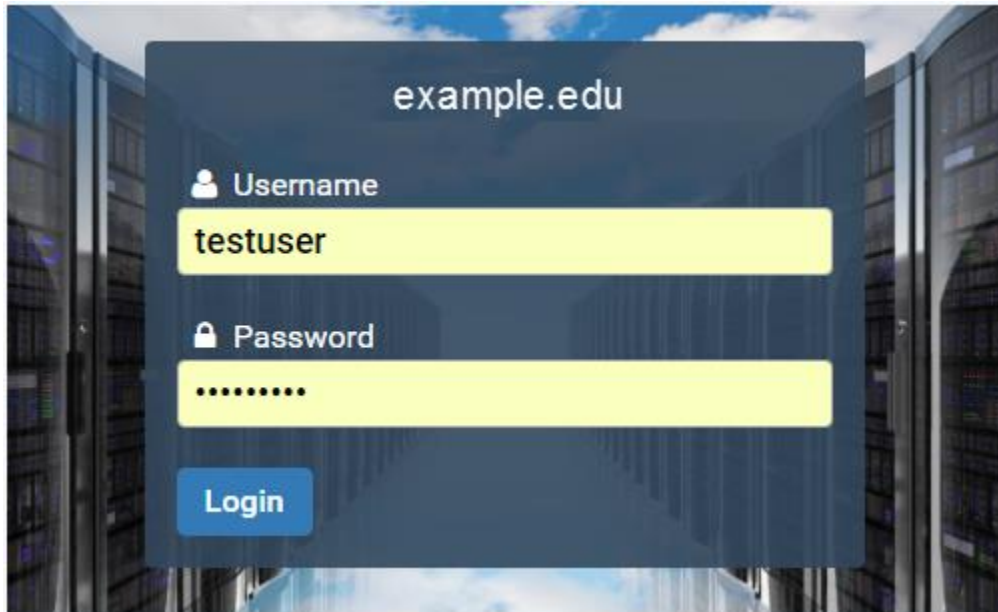
1. To access the login page, open a web browser and type in the URL or IP address of the NETLAB+ system. Using the most recent available version of the browser you select is recommended. NETLAB+ has been tested with the web browsers listed in the table below.



Cookies and JavaScript must be enabled in your browser. The latest information on supported web browsers is available from **Help > Supported Web Browsers** when signed in to a NETLAB+ account.

	Browser	Minimum Version	Support/Experience
	Google Chrome	54.0	*****
	Mozilla Firefox	46.0	****
	Apple Safari (MAC only)	11.0.3	****
	Microsoft Edge	40.15063.674.0	**
	Microsoft Internet Explorer		No longer supported

2. Enter your Username  and Password  into the fields in the login box and then click the **Login** button. The graphics on the page may be different from the example shown below. You will be prompted to change your initial password; see the next section for details.



1.1 Change Password During Initial Login

During your first login, you will be required to change your password after you successfully provide your username and initial password. NETLAB+ enforces strong passwords.

Passwords must meet the following requirements:

- **Not found in the common dictionary and not too simple**
- **7 or more ASCII characters**
- **Contain both numbers and letters**

One strategy you may find helpful in selecting a new password is to combine a word together with numbers. For example, you could not use the word “airplane”, but you could use “airplane789”. You may not reuse your initial password.

Change Password

New Password

Retype New Password



Notice the **Help** button. You can click the **Help** button on this and other NETLAB+ pages to display information to assist you in entering information and making selections. To hide the help information, click the button again.

Change Password

New Password
Enter your new password here.

Retype New Password
Enter your new password again for confirmation.

1. Enter your selection into the **New Password** field.
2. Enter the password once again in the **Retype New Password** field and then click **Submit**.



An error message will be displayed if the password entered does not meet the requirements. The message will indicate why the password was unacceptable.

Examples of typical password errors:

- The error message shown below indicates that the password entered did not meet the minimum length requirement.

New Password

Password must be 7 or more characters.

- The error message shown below indicates that the new password entered is a simple word found in the common dictionary and therefore not eligible to be a password on the system.

New Password

Password cannot be a common dictionary word.

- If the values in the two password fields do not match, an error message will be displayed, similar to the one shown below.

Retype New Password

**The provided passwords do not match.
Please try again.**



If you receive an error, correct the information in the fields as needed and click **Submit** again.



Make note of your new password, you will need it each time you log into the NETLAB+ system.

1.2 Change E-mail Address During Initial Login

The next field you will be prompted to enter is your **E-mail Address**. This field may already contain a value if an e-mail address was entered at the time your account was created. You may edit the e-mail address if needed. Entering an e-mail address is optional.

Change E-mail Address

E-mail Address

- Update the **E-mail Address** field as desired and click **Submit**. The e-mail address must be in a valid format (example, *username@domain.xxx*); otherwise, an error message will be displayed.

E-mail Address

Invalid email address



If you receive an error, correct the information as needed and click **Submit** again.

1.3 Change Date and Time Settings During Initial Login

Next, you will select your local time zone and your preferences for dates, times, and calendars. These settings are especially important to ensure that information is displayed accurately when using the scheduler.




When traveling, you can change your time zone to match the local time.

🕒 Date and Time Settings

Time Zone	(GMT-05:00) Eastern Time (US & Canada) ▼
Date Display Format	YYYY-MM-DD ▼
Time Display Format	24 Hour ▼
First Day of Week	Sunday ▼

1. Select the **Time Zone** where you are located. NETLAB+ will adjust for Daylight Savings Time.
2. Choose the **Date Display Format** you prefer. This is the style that dates will be displayed (for example, *YYYY-MM-DD*).
3. Select the **Time Display Format**. Time may be displayed in 12-hour (AM/PM) format or 24-hour format.
4. Select the **First Day of the Week** to be shown in the scheduling calendar. Sunday is the default.
5. When you are finished making any necessary modifications, click **Submit**.

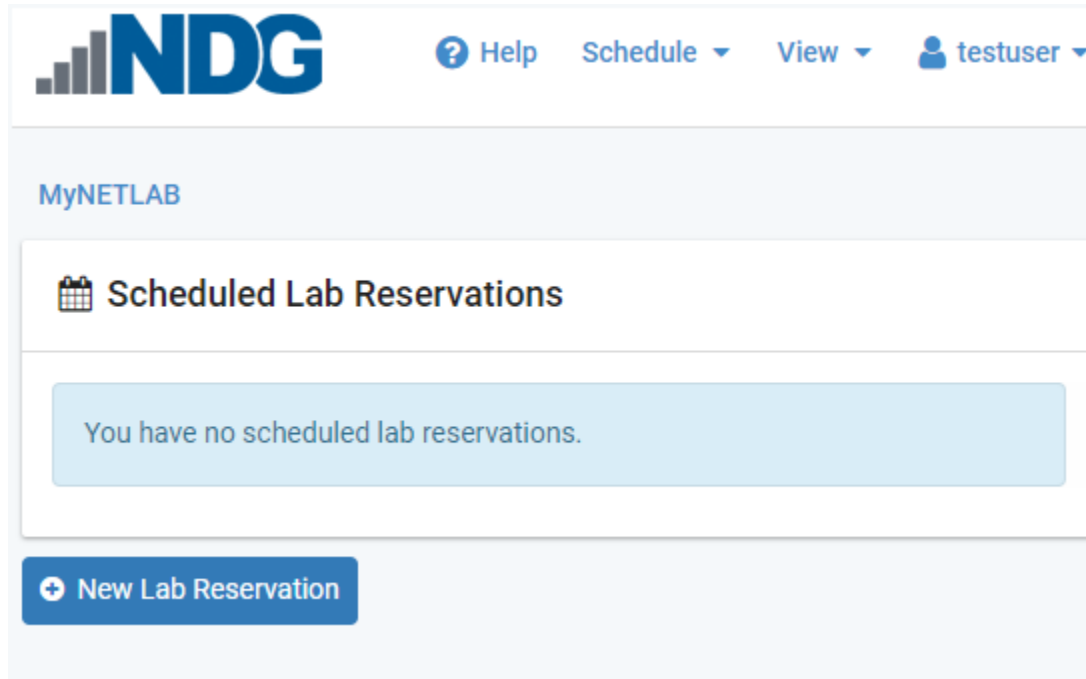


- You can change your settings again later by choosing settings from the user menu option.

6. As noted in the message displayed, these settings may be changed as needed. Click **Understood**.
7. The MyNETLAB page will be displayed.

2 MyNETLAB Interface

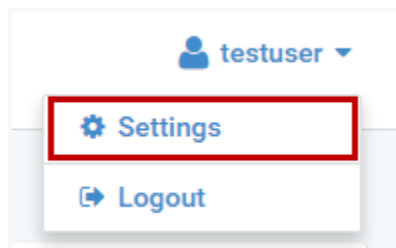
After a successful login, the MyNETLAB page will be displayed. Any scheduled lab reservations will be displayed here. If this is your first time logging into the system, it is likely that there are no scheduled lab reservations to display (unless a lab reservation has been made by your instructor).



2.1 Modify User Settings

The settings you made during your initial login may be modified any time, as needed.

- To access the Settings page, click your username in the top-right corner and select **Settings**.



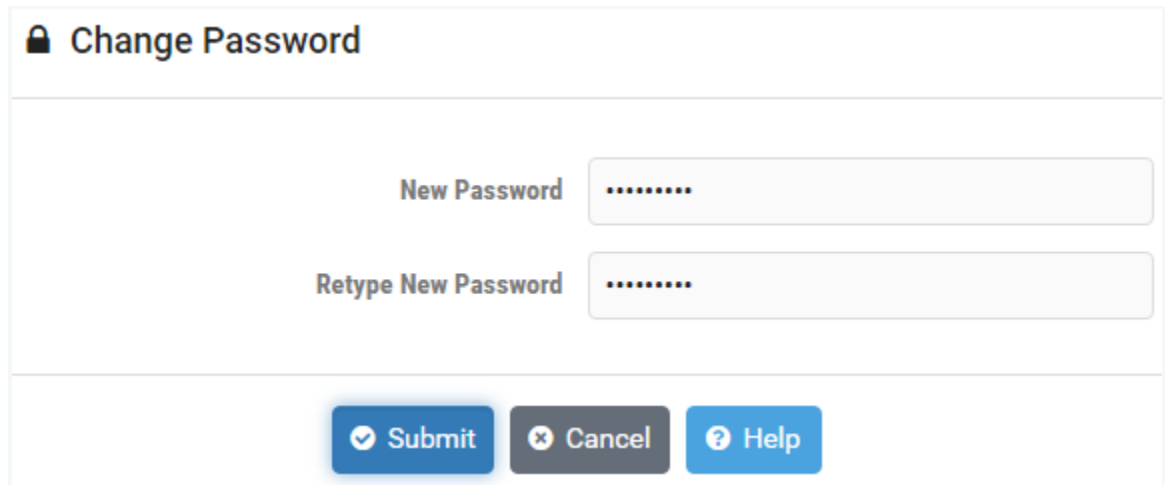
The Settings page will display your current user settings.

Community	default	
Username	testuser	🔒 Change Password
First Name	Testuser	
Last Name	Ndg	
Display Name	Test User	
Email	testuser@example.edu	✉ Change Email
Date and Time	🕒 (GMT-05:00) Eastern Time (US & Canada) 📅 YYYY-MM-DD 🕒 24 Hour (Digital)	⚙ Settings

The **Change Password**, **Change Email**, and **Settings** buttons may be selected to update the information displayed.

2.1.1 Change Password

1. Click the Change Password button on the Settings page to display the **Change Password** page.



The screenshot shows a web form titled "Change Password" with a lock icon. It contains two text input fields: "New Password" and "Retype New Password", both with masked characters (dots). Below the fields are three buttons: "Submit" (blue with a checkmark icon), "Cancel" (grey with an 'x' icon), and "Help" (blue with a question mark icon).

Passwords must meet the following requirements:

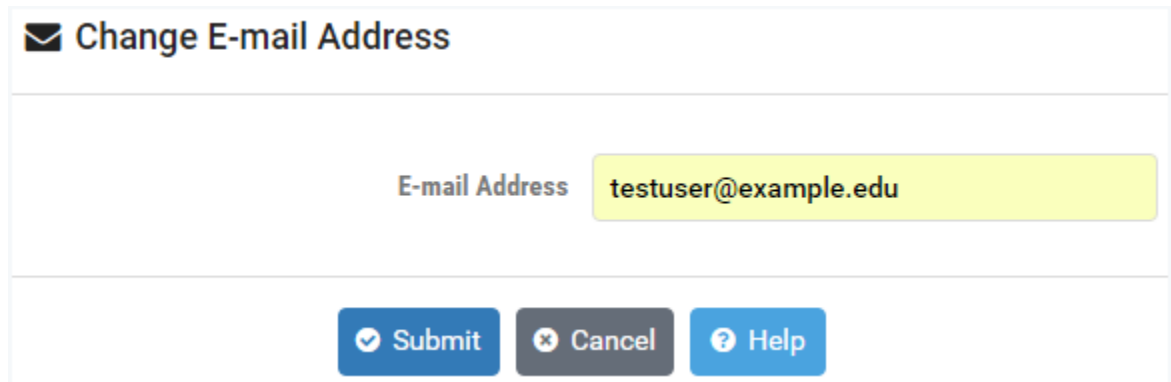
- **Not found in the common dictionary and not too simple**
 - **7 or more ASCII characters**
 - **Contain both numbers and letters**
2. Enter your selection into the **New Password** field.
 3. Enter the password once again in the **Retype New Password** field.
 4. To proceed with updating your password, select the **Submit** button. You will return to the MyNETLAB page. (Or, if you decide that you do not want to change your password, you may select the **Cancel** button to return to the MyNETLAB page with your password remaining unchanged.)



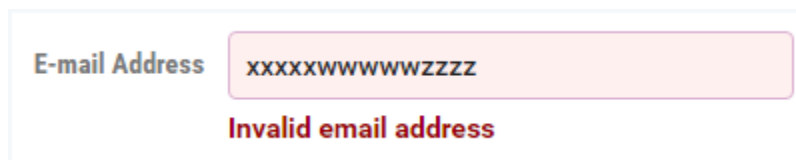
If you receive an error, correct the information in the fields as needed and click **Submit** again.

2.1.2 Change E-mail

1. Click the Change E-mail button on the Settings page to display the **Change E-mail Address** page. Entering an e-mail address is optional.



2. Update the **E-mail Address** field as desired. Click **Submit** to save changes and return to the MyNETLAB page. (Or, select **Cancel** to return with no changes made). The e-mail address must be in a valid format (example, *username@domain.xxx*); otherwise, an error message will be displayed.



If you receive an error, correct the information in the fields as needed and click **Submit** again.

2.1.3 Change Date and Time Settings

1. Click the Settings button on the Settings page to display the **Date and Time Settings** page. These settings are especially important to ensure that information is displayed accurately when using the scheduler.



When traveling, you can change your time zone to match the local time.



Recall that you can display help information for guidance on updating the values on a page by clicking the **Help** button. The Date and Time Settings page is shown below, with help displayed.

🕒 Date and Time Settings

Time Zone (GMT-05:00) Eastern Time (US & Canada) ▼
The time zone where you are located. NETLAB+ will adjust for Daylight Savings Time.

Date Display Format YYYY-MM-DD ▼
The style in which dates will be displayed.

Time Display Format 24 Hour ▼
Display times in 12 hour (AM/PM) format, or 24 hour format.

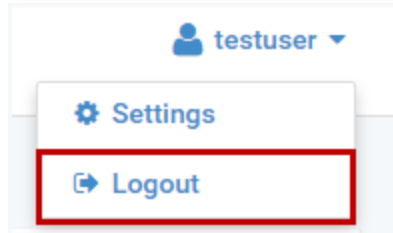
First Day of Week Sunday ▼
Sets the first day of the week to be shown in a calendar.

2. Select the **Time Zone** where you are located. NETLAB+ will adjust for Daylight Savings Time.
3. Choose the **Date Display Format** you prefer. This is the style that dates will be displayed (for example, *YYYY-MM-DD*).
4. Select the **Time Display Format**. Time may be displayed in 12-hour (AM/PM) format or 24-hour format.
5. Set the **First Day of the Week** to be shown in the scheduling calendar.
6. When you are finished making modifications, click **Submit**. The MyNETLAB page will be displayed. (Or, to return to the MyNETLAB page without saving changes, click **Cancel**.)

2.2 Logout

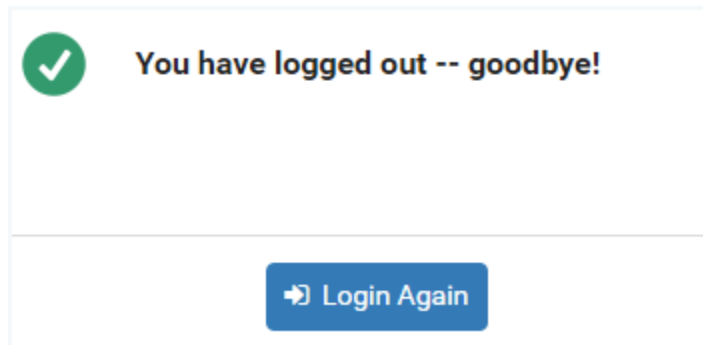
The **Logout** link is used for logging out of the NETLAB+ system.

1. Click your username in the top-right corner of the MyNETLAB page and select **Logout**.



Logging out of the system is particularly important when using a shared computer, to prevent others from gaining access to your account.

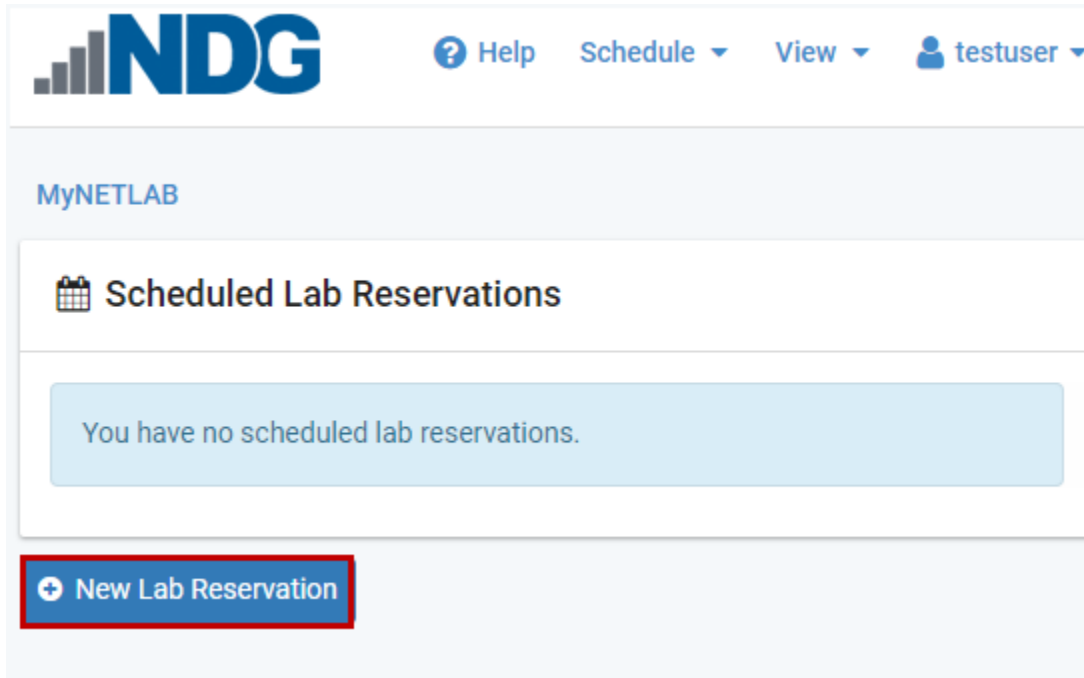
2. A confirmation message will display, select the button if you want to **Login Again** and return to the login screen.



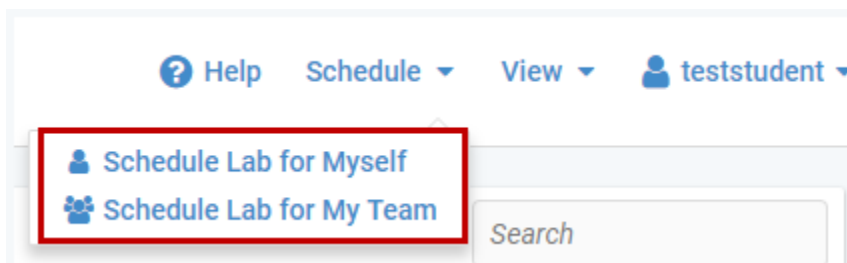
3 Schedule Lab Reservations

This section provides step-by-step instructions for scheduling a lab reservation using the virtual edition of NETLAB+. We will show you how to access the scheduling feature on the MyNETLAB page, select a lab from the lab listing, and the features of the Pod Scheduler.

To schedule a lab reservation, log in to NETLAB+, and select the **New Lab Reservation** button on the MyNETLAB page.



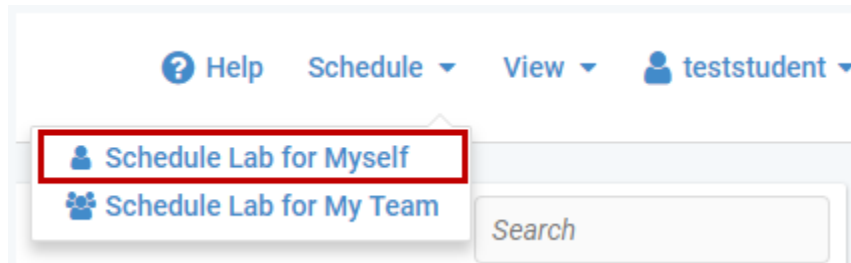
Alternatively, you may select the **Schedule** option on the MyNETLAB page. You will have the option to schedule a lab for yourself or to share as a team.



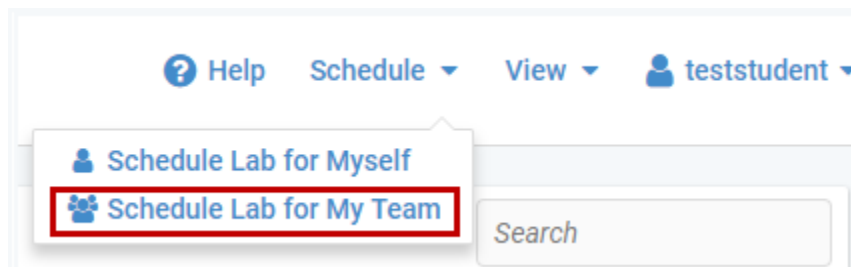
3.1 Schedule a Lab for Yourself or for Your Team

You may choose to schedule a lab for yourself or to share as a team that you have been assigned to by your instructor.

- If you choose the **Schedule Lab for Myself** option, access to the lab reservation will be available only to you and the lead instructor of your class.



- If you choose the **Schedule Lab for My Team** option, access to the lab reservation will be available to all members that have been assigned to your team and the lead instructor of your class.



As a student, you may only make team reservations if you have been assigned to a team by your instructor AND your instructor has granted access to your class to allow students to schedule team reservations themselves.

3.2 Select a Class

If you are enrolled in more than one class, you will select the class from the list of Available Classes.



If you are a member of one class only, the Available Classes page will not be displayed. Instead, the list of labs (see next section) will be displayed immediately.

You are a member of more than one class. Please select the class this reservation is for.

Available Classes


Name ▲	Instructors ▼	Start Date ▼	End Date
EMC ISM Fall 2017	Test Instructor	None	None
Ethical Hacking Spring 2018	Test Instructor	None	None

3.3 See a List of Labs

A list of the labs associated with the class will be displayed. In this example, the student is enrolled in an NDG Ethical Hacking class.

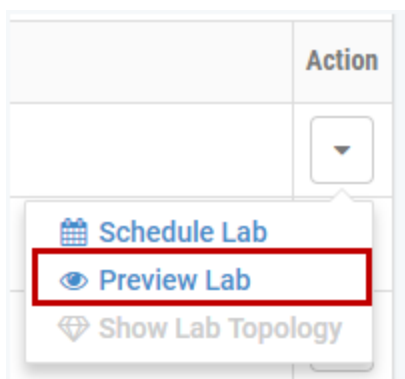


You may search for a lab by entering a value in the search box in the upper-right corner.

 NDG Ethical Hacking <input type="text" value="Search"/>	
Lab Name	Action
Lab 01: Reconnaissance with Nmap and Amap	<input type="button" value="▼"/>
Lab 02: Social Engineering Attacks with Social Engineering Toolkit	<input type="button" value="▼"/>
Lab 03: Metasploit Framework Fundamentals	<input type="button" value="▼"/>
Lab 04: Web Pentesting with Nikto and OWASP Zap	<input type="button" value="▼"/>
Lab 05: Password Cracking with John the Ripper and Hashcat	<input type="button" value="▼"/>
Lab 06: Creating and Installing SSL Certificates	<input type="button" value="▼"/>

3.4 Preview Lab Content

To see a preview of the instructional material associated with a lab, select **Preview Lab** on the Action dropdown at the end of the lab list row.



The content will be displayed. The options available to zoom the view, download, and print the content will vary, depending on your browser settings. Click **Dismiss** when you are finished previewing the content.

Content: Lab 01: Reconnaissance with Nmap and Amap

Lab 1: Reconnaissance with Nmap & Amap	Lab 2: Vulnerability Assessment with Nessus	Lab 3: Penetration Testing with Metasploit
1. Introduction to Nmap and Amap	1. Introduction to Nessus	1. Introduction to Metasploit
2. Nmap and Amap	2. Nessus	2. Metasploit

Dismiss

[Lab 04: Web Pentesting with Nikto and OWASP Zap](#)

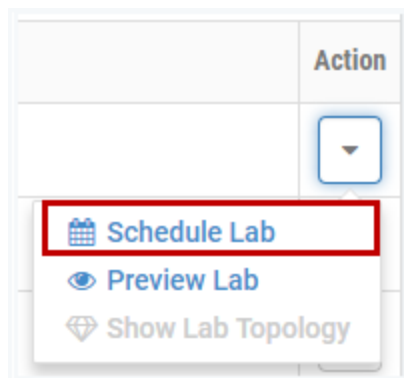
[Lab 05: Password Cracking with John the Ripper and Hashcat](#)

3.5 Enter the Pod Scheduler

To schedule a lab session, click the Lab Name.

NDG Ethical Hacking <input type="text" value="Search"/>	
Lab Name	Action
Lab 01: Reconnaissance with Nmap and Amap	<input type="button" value="▼"/>
Lab 02: Social Engineering Attacks with Social Engineering Toolkit	<input type="button" value="▼"/>
Lab 03: Metasploit Framework Fundamentals	<input type="button" value="▼"/>
Lab 04: Web Pentesting with Nikto and OWASP Zap	<input type="button" value="▼"/>
Lab 05: Password Cracking with John the Ripper and Hashcat	<input type="button" value="▼"/>
Lab 06: Creating and Installing SSL Certificates	<input type="button" value="▼"/>

The scheduler may also be accessed by selecting **Schedule Lab** on the Action dropdown at the end of the lab list row.



3.6 Explore Pod Scheduler Features

The Pod Scheduler will be displayed, allowing you to schedule a lab reservation for the selected lab.

📅 Pod Scheduler

◀ ⬆ June 2018 ▶

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30


Selected Day

June

29



2018

Current Time



12:05

Eastern Time (US & Canada)

	Ethical_Hacking_Pod_1 	Ethical_Hacking_Pod_2 
11:00	Reservation 103	Reservation 101
12:00		
13:00		
14:00		

Pod Scheduler Features:

- **Calendar:** Use the calendar in the upper-left corner to select the date for the reservation by clicking on the date of your choice. You may scroll from month to month by selecting the ◀ and ▶ buttons. Select the ⬆ button to reset the selected day to today's date.
- **Selected Day:** The day selected on the calendar is shown here. It is initially set to today's date but can be modified by making a new selection on the calendar.
- **Current Time:** Displays the current time, according to your time zone settings. The time may be displayed using 12-hour or 24-hour time, depending on your settings.

- Schedule Table:** The columns of the table show the pods available to you for scheduling the selected lab. The number of pods available will depend upon the number and type of pods that have been installed on your NETLAB+ system. Consult your instructor or NETLAB+ Administrator if you have questions about the pods available to you. The rows of the table show reservation times. The solid red line indicates the current time.

3.7 Select a Reservation Time

- To select a lab reservation time, scroll the table as needed to display available time-slots. The time-slots below the red line (current time), may be selected if available.



If you want to start your lab reservation now, select the time-slot immediately below the red line.

	Ethical_Hacking_Pod_1 	Ethical_Hacking_Pod_2
	Reservation 103	
12:00		
		Select here to start a lab now on Pod 2.
13:00	Reservation 104	
14:00		
15:00		

2. Select a lab reservation time on a pod by clicking the appropriate box for the time-slot. Details of the lab reservation are displayed. Review the reservation details, including changing the End Time if needed (see picture below), and then click **Submit**.

Add Reservation

Pod Ethical_Hacking_Pod_1

Reservation Type Individual Self Study


Class Name Ethical Hacking Spring 2018

Reserve For Test Student

Lab Exercise Lab 01: Reconnaissance with Nmap and Amap

Time Zone Eastern Time (US & Canada)

Start Time 2018-06-29 14:00

End Time 2018-06-29 15:00 

Length of Reservation 50 mins.

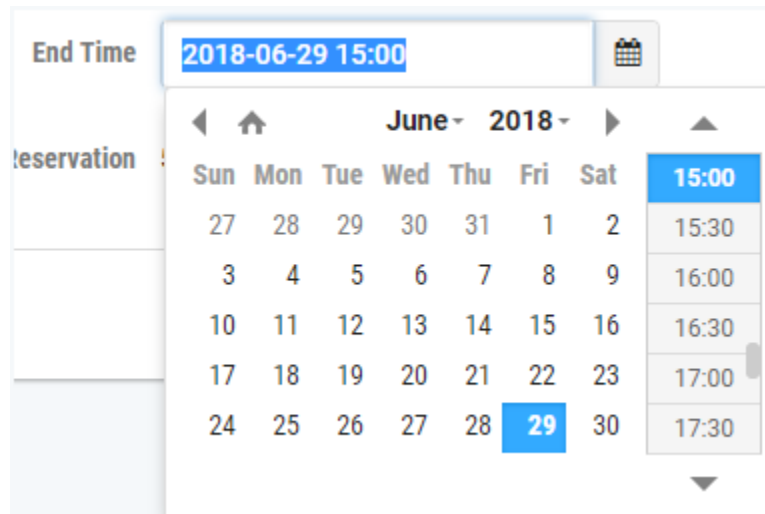


Keep in mind that the last 10 minutes of a lab reservation is used for system cleanup and reset. As shown in the example above, the Length of Reservation for a 1-hour timeslot is 50 minutes.

The End Time may be modified by clicking the End Time field and selecting a new time on the popup calendar (subject to pod availability and whether the Time Limit is set to be enforced for the class).

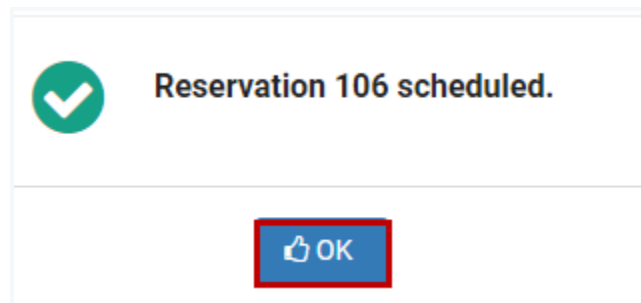



As a student, your ability to change the End Time of your lab reservation may be restricted by lab reservation time limits set by your instructor and/or NETLAB+ administrator.




End Time		2018-06-29 15:00	📅					
Reservation	June 2018							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	15:00
	27	28	29	30	31	1	2	15:30
	3	4	5	6	7	8	9	16:00
	10	11	12	13	14	15	16	16:30
	17	18	19	20	21	22	23	17:00
	24	25	26	27	28	29	30	17:30

3. A confirmation message will display. Select **OK** to return to the MyNETLAB page.




 **Reservation 106 scheduled.**








3.8 See the Lab Reservation Displayed on the MyNETLAB Page

The reservation is now shown in the list of **Lab Reservations**.




Reservations you make for yourself will be listed and accessible to you and the instructor of your class. If you make a team reservation, the reservation will be listed and accessible to all team members and your instructor.








 Lab Reservations Search			
ID	Date/Time	Description	Pod
106	 2018-06-29 14:00  2018-06-29 15:00  50 mins.	Class: Ethical Hacking Spring 2018 User: Test Student Class: Lab 01: Reconnaissance with Nmap and Amap	Ethical_Hacking_Pod_1 

4 Enter a Lab Session

At the scheduled time of a lab reservation, the **Enter Lab** button will display. Select the button to enter the lab and display the lab access interface.




It may be necessary to refresh your browser screen to display the **Enter Lab** button at the scheduled time.

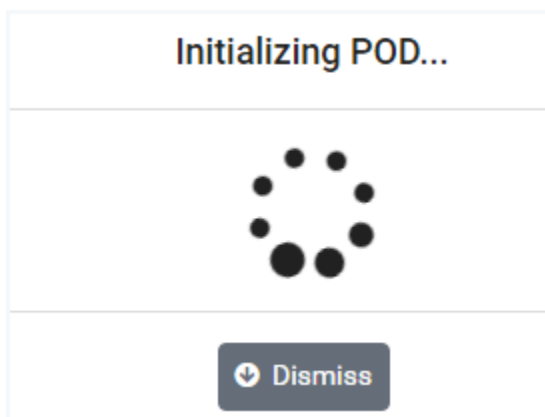
Scheduled Lab Reservations Search			
ID	Date/Time	Description	Pod
28	 2016-06-20 5:07PM  0.9 hours <div style="border: 2px solid red; padding: 2px; display: inline-block; margin-top: 5px;"> Enter Lab  </div>	Class: EMC ISM User: Test User Exercise: Lab 01: Introduction to Storage	EMC_ISMv2_POD1  Academy ISM v2
27	 2016-06-20 6:00PM  1.0 hours	Class: EMC ISM User: Test User Exercise: Lab 01: Introduction to Storage	EMC_ISMv2_POD2  Academy ISM v2

Show 10 entries Showing 1 to 2 of 2 items < 1 >

You may see the **Initializing POD** indicator displayed on the page at the beginning of your session. This indicates that NETLAB+ is in the process of initializing the lab devices in the pod to prepare them for use. Allow the initialization to proceed.

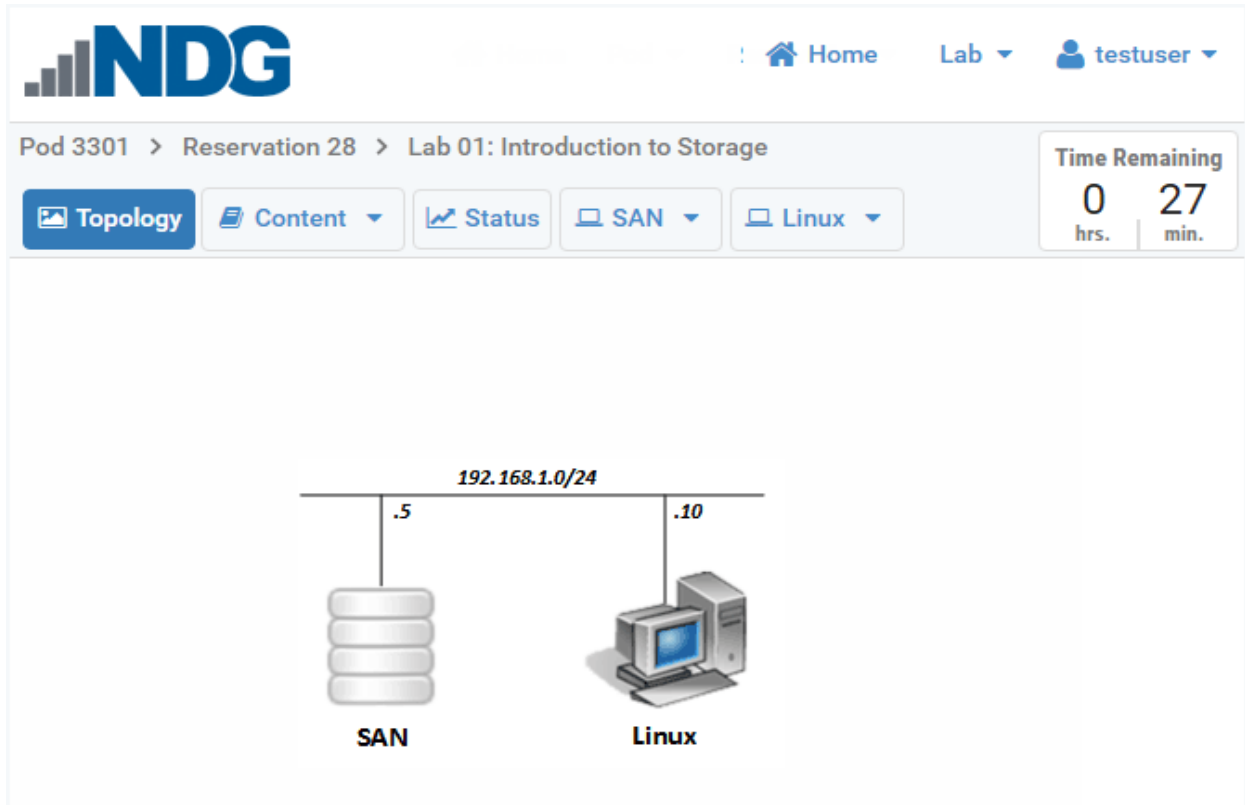


Click **Dismiss** only if you prefer to interrupt the process and return to the MyNETLAB page.

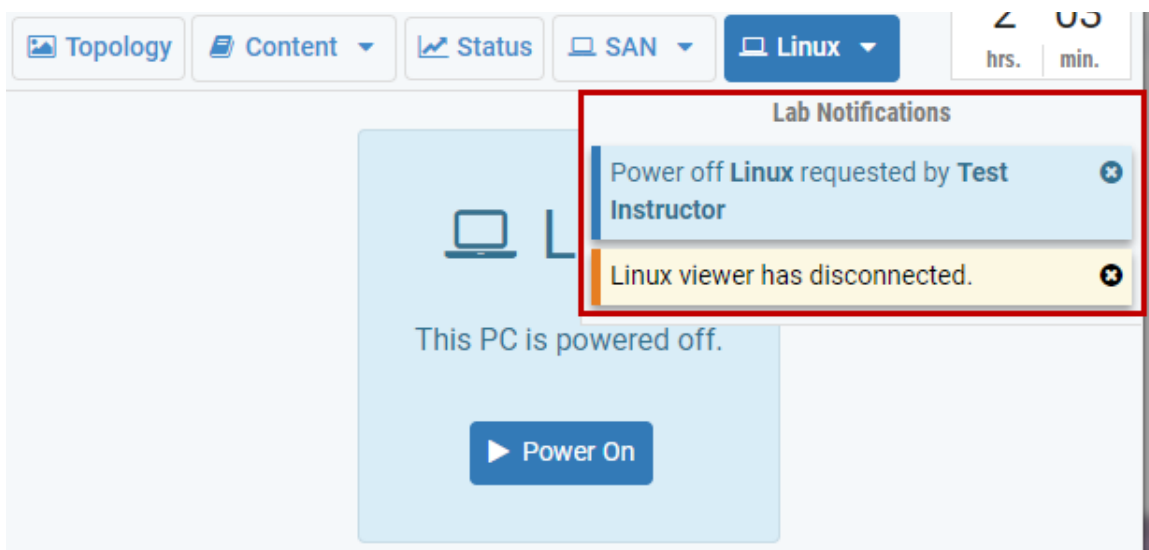


4.1 Explore the Tabbed Sections of the Lab Access Interface

The lab access interface is divided into several tabbed sections. The **Topology**, **Content**, and **Status** tabs provide access to NETLAB+'s functions. Additional tabs provide access to the devices in the pod (devices included in pods vary).



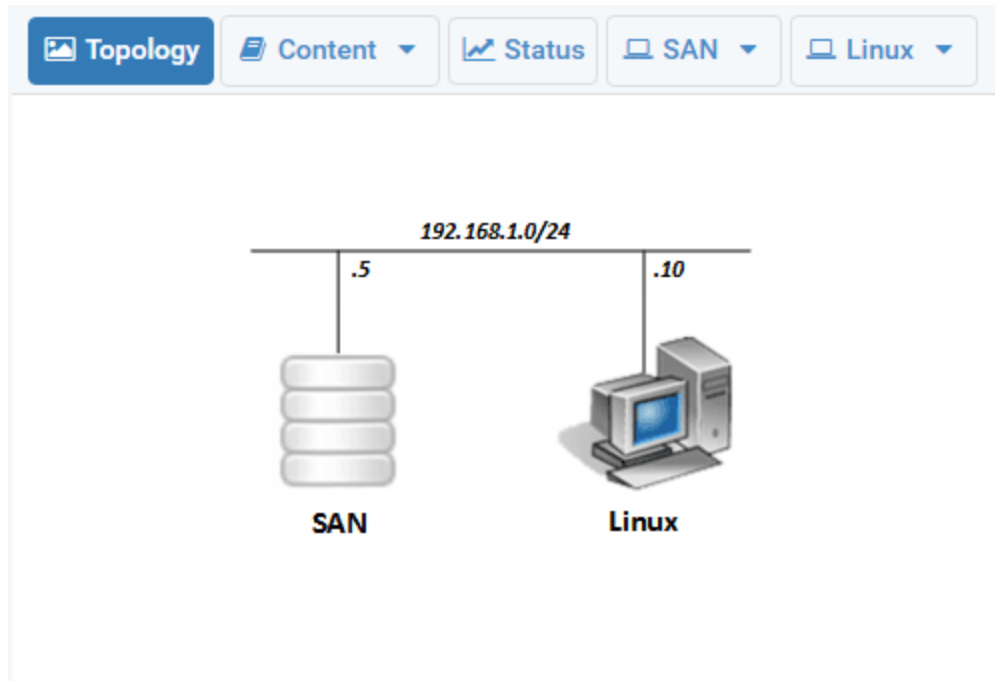
As you perform different actions throughout your lab session in any of the tabbed sections, you will see **Lab Notifications** displayed in the right corner, below the Time Remaining Indicator. Most messages are set to display only briefly.



4.1.1 Topology Tab

The **Topology** tab displays the lab topology, including the IP addressing scheme and physical or logical connections.

In this example, the topology diagram shows two devices: a SAN and a Linux machine.



Clicking on the icon of a device on the topology diagram will change the active tab to the tab for the selected device (accessing a device is discussed below).

4.1.2 Content Tab

The **Content** tab displays the lab content, the instructional material associated with the lab.



If the content is not displayed on the Content tab, please refer to the section below for configuration guidance.

Pod 3301 > Reservation 28 > Lab 01: Introduction to Storage

Time Remaining: 0 hrs. 21 min.

Topology Content Status SAN Linux

Lab 1: Introduction to Storage 7 / 13

NDG

Lab 1: Introduction to Storage

- Switch to the *Topology* window and click on the **Linux** client.

Linux

- Log into the *Linux* client machine. Ensure that the username is set to *sysadmin*, then type in the password field. Click the **Log In** button or press **Enter** to log into the system.
- Open **Firefox** by clicking on the **Web Browser** icon in the *app launcher* located on the bottom panel bar.



You may see options to rotate the display of the content, download, and print. The options available will vary, depending on your choice of browser and your browser settings.


Topology Content Status SAN Linux

Lab 1: Introduction to Storage 7 / 13

Refresh Download Print


To adjust your view of the content, you may see buttons to toggle the content display between Fit to Width/Fit to Display and Zoom in/Zoom out. (These options will vary, depending on your browser selection and browser settings.)

3. Switch to the *Topology* window and click on the **Linux** client.



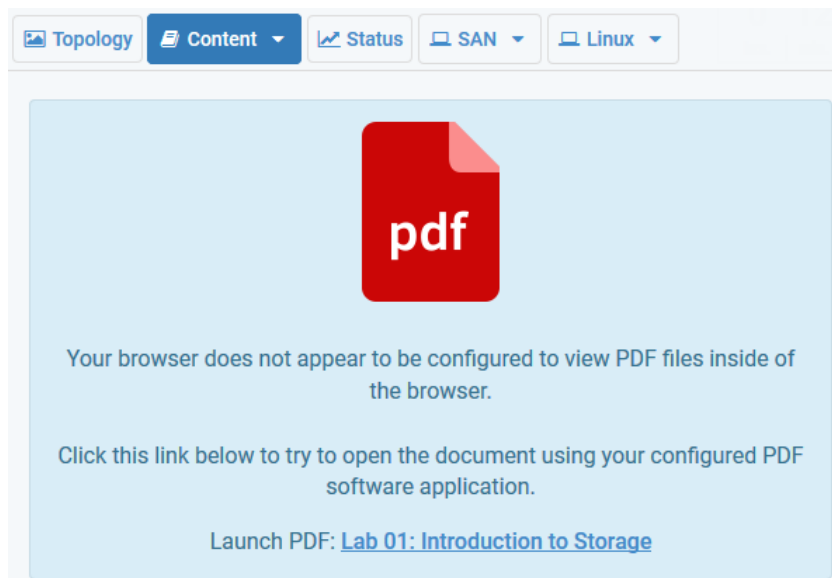
4. Log into the *Linux* client machine. Ensure that the username is set to *sysadmin*, then type in the password field. Click the **Log In** button or press **Enter** to log into the system.

5. Open **Firefox** by clicking on the **Web Browser** icon in the *app launcher* located on the bottom panel bar.



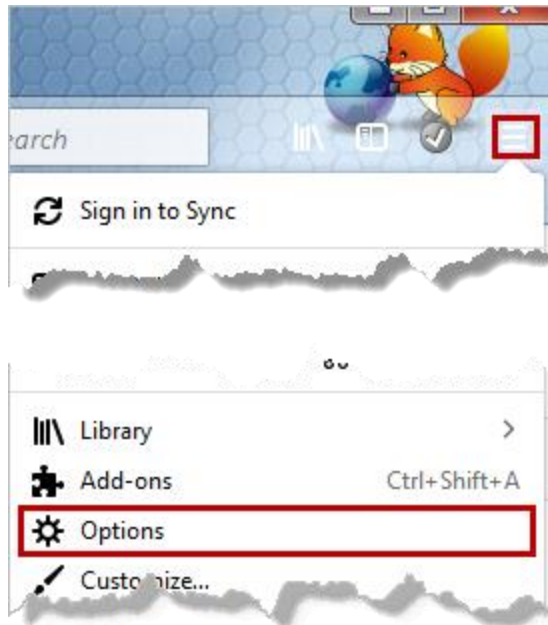
4.1.2.1 Configure the Browser to Display Content

If your browser is not configured to view PDF files inside the browser, the content will not be displayed. Instead, you will see a message similar to the screen shown below.



You may launch the PDF in a separate window by clicking the link. But, if you would like to configure your browser to display the PDF, you may do so by following the steps below. For this example, we will configure the Firefox browser. The steps required to configure your browser will vary, depending on your selection of browser and browser settings.

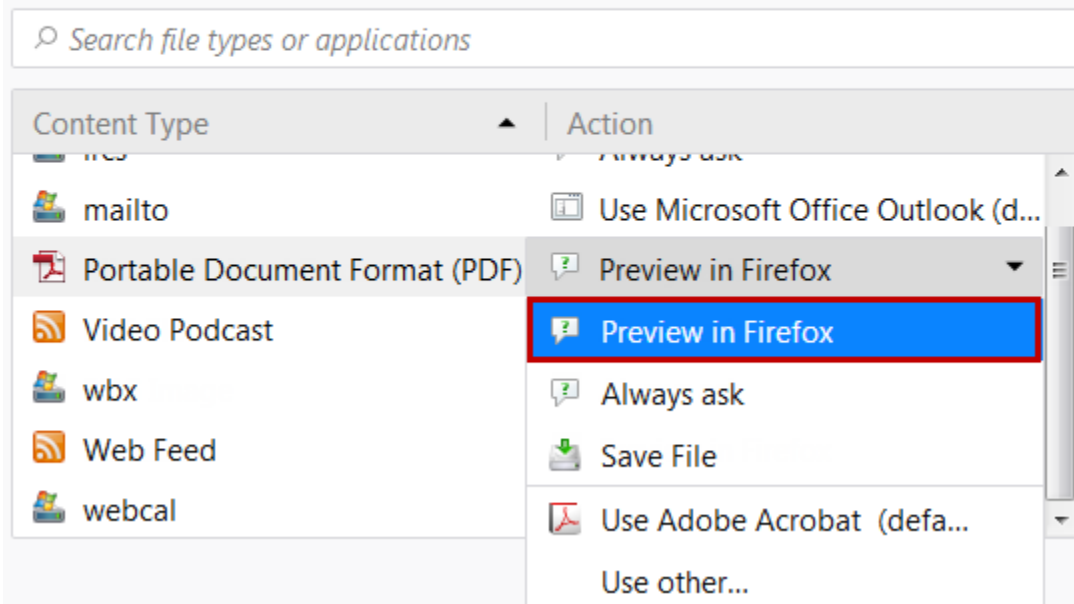
1. Open the Firefox menu and select **Options**, which will open in a new browser tab.



2. Scroll down the Options page and locate the Applications section. Select the Content Type of **Portable Document Format (PDF)** and set the Action to **Preview in Firefox**.

Applications

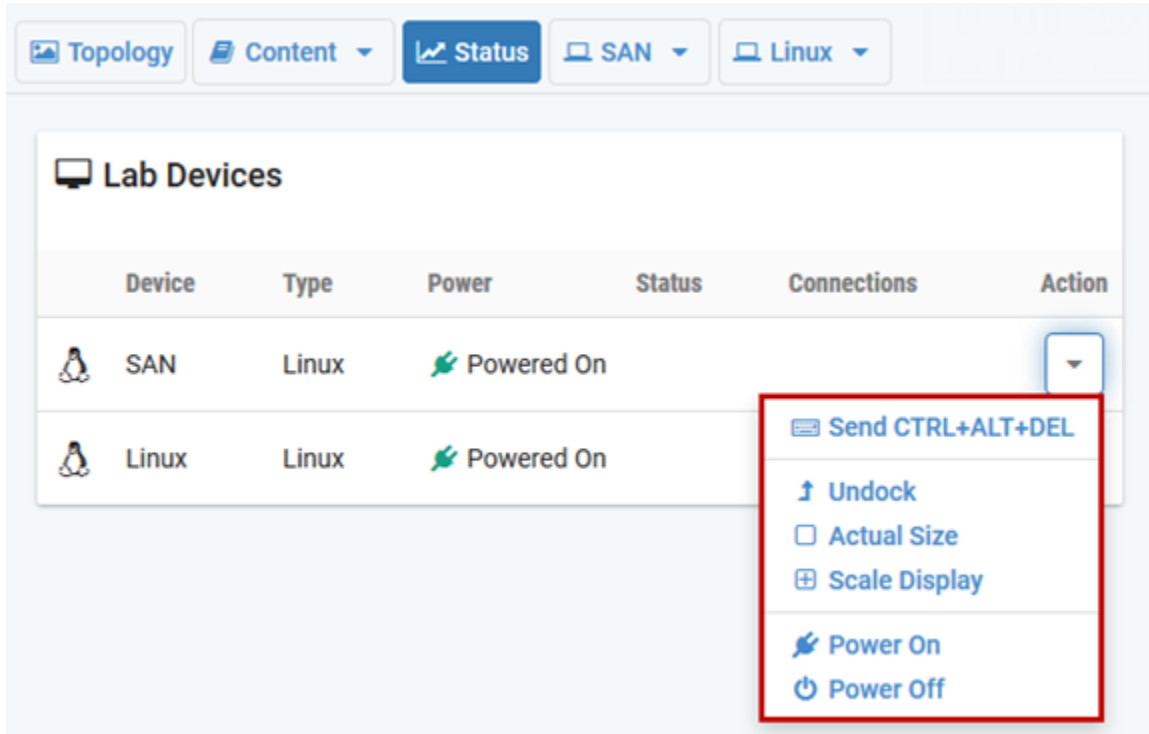
Choose how Firefox handles the files you download from the web or the applications you use while browsing.








3. Select the browser tab to return to your NETLAB+ lab session. It may be necessary to reload the browser page and re-select the Content tab. The content should now be displayed.

4.1.3 Status Tab

The status of all devices in the pod is displayed on the **Status** tab.



The screenshot shows the 'Status' tab in the NETLAB+ interface. At the top, there are navigation buttons for 'Topology', 'Content', 'Status' (selected), 'SAN', and 'Linux'. Below this is a section titled 'Lab Devices' containing a table with the following columns: Device, Type, Power, Status, Connections, and Action.

Device	Type	Power	Status	Connections	Action
 SAN	Linux	 Powered On			
 Linux	Linux	 Powered On			

The 'Action' dropdown menu for the first row is open, showing the following options:

- Send CTRL+ALT+DEL
- Undock
- Actual Size
- Scale Display
- Power On
- Power Off

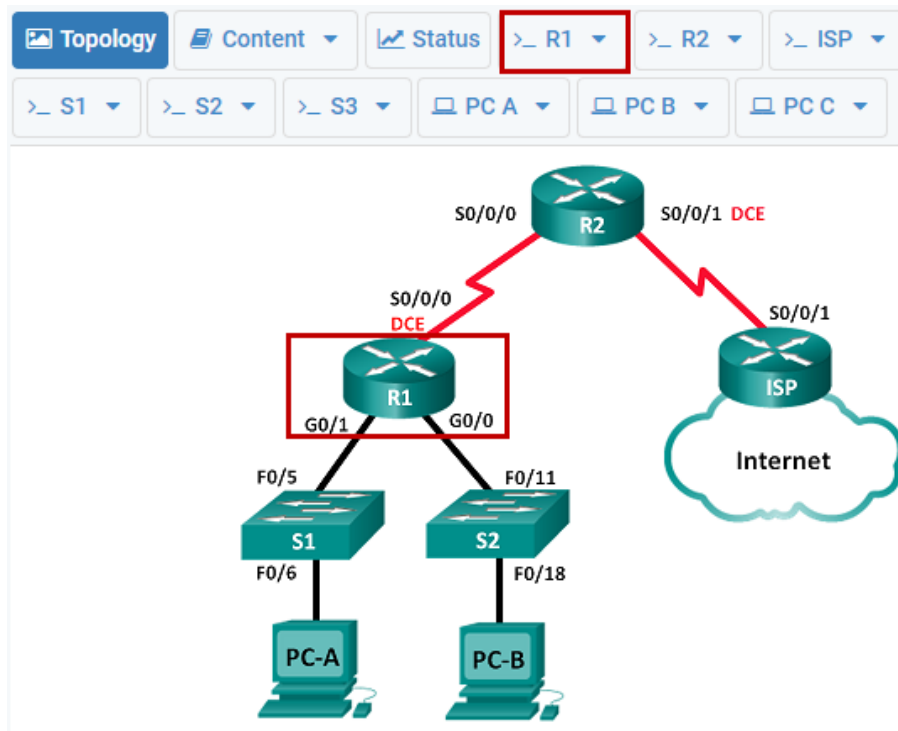
NETLAB+ provides several options for managing devices (options available vary by device), which may be accessed by clicking on the Action dropdown:

- **Send CTRL+ALT+DEL:** Simulate the action of pressing CTRL+ALT+DEL on the device.
- **Undock:** Access to the device is made available in a separate, floating window, allowing you to position and arrange windows to suit your needs. (for details, see the [Undock and Dock Device Windows](#) section).
- **Actual Size, Scale Display:** Options to adjust the size of the output displayed in the window, relative to the size of the viewer window.
- **Power on, Power Off:** Options to toggle the power of the device.

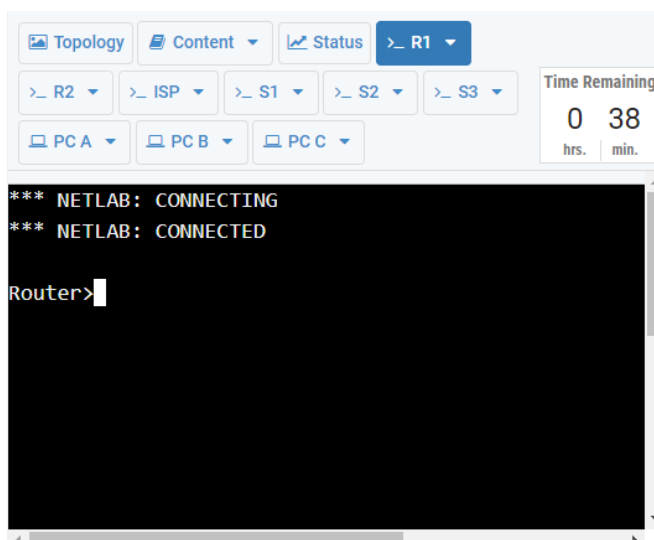
4.2 Access a Device

In this section, we will illustrate the process of accessing one of the devices in the pod, starting from the **Topology** tab. For this example, we will use a Multi-purpose Academy Pod (MAP).

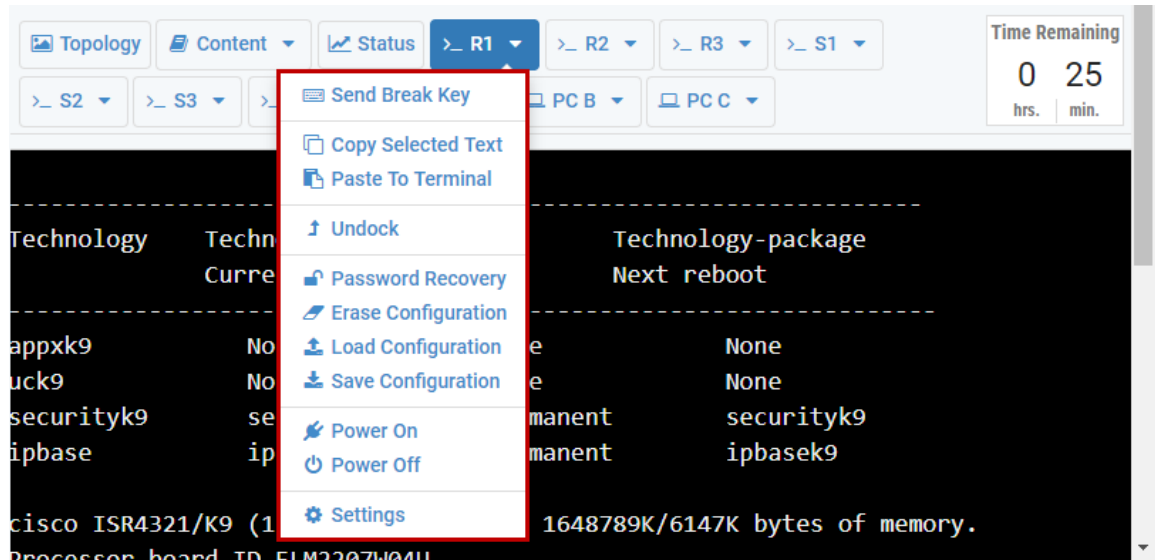
1. Access the R1 router by clicking the icon on the topology diagram or by clicking on the **R1** device tab.



2. The active tab will change to the **R1** tab, and the R1 router will be displayed in the viewer. You may interact with the device as if you were accessing it directly, including entering credentials (typically provided in content) and entering commands.



- As we saw in the Status Tab, NETLAB+ provides several options for managing devices, which may also be accessed by clicking on the currently selected device name tab (R1, in this example).



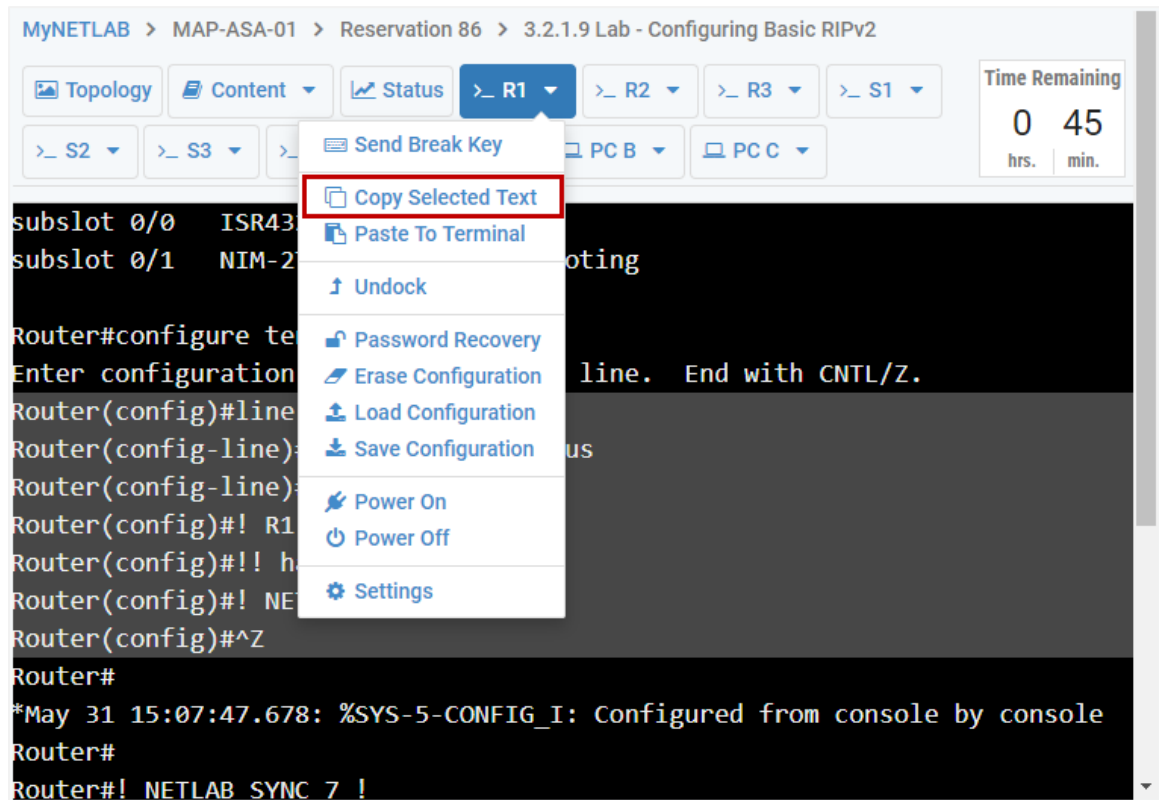
Options available on specific devices may vary; typical choices for routers (as in this example) include:

- **Send Break Key:** Simulate the action of the Break Key sequence on the device.
- **Copy Selected Text:** Copy selected text to the clipboard. See the [Copy Selected Text](#) subsection below.
- **Paste to Terminal:** Paste configuration text to a device's terminal (see [Paste to Terminal](#)).
- **Undock:** Access to the device is made available in a separate, floating window, allowing you to position and arrange windows to suit your needs (see the [Undock and Dock Device Windows](#) subsection below).
- **Password Recovery:** Unlock the console and enable passwords on a device. See the [Password Recovery](#) subsection below.
- **Erase, Load, and Save Configurations:** If you are accessing console-based devices such as Cisco routers, switches, and firewalls, you will see additional options to erase, load, and save configurations.
- **Power on, Power Off:** Options to toggle the power of the device.
- **Settings:** Custom terminal styles allow you to select the background color, text color, and font size for your device. Styles are saved and used in all future labs using the same pod type. Please see the [Terminal Settings](#) section below for details.

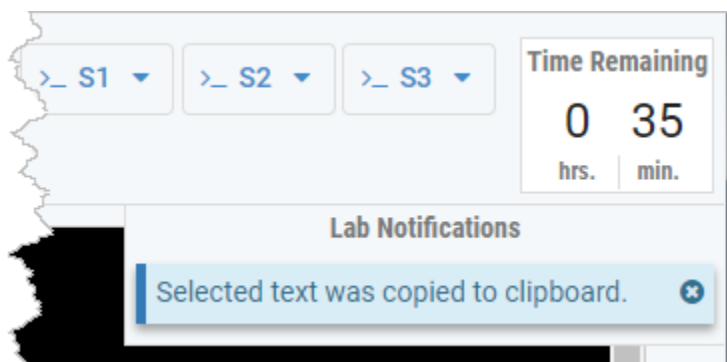
4.2.1 Copy Selected Text

To copy text from the terminal to the clipboard, perform the following steps.

1. Select the text by holding down the left mouse button and dragging the mouse pointer to highlight the text.
2. Click the **Copy Selected Text** option on the device tab.



3. Notice a lab notification message will briefly display, confirming the selected text was copied to the clipboard. You may paste the text to the application of your choice. To paste into a typical Windows application, use **CTRL+V** or **Right-click > Paste**. Your options for pasting may vary, depending on your system selections and settings.



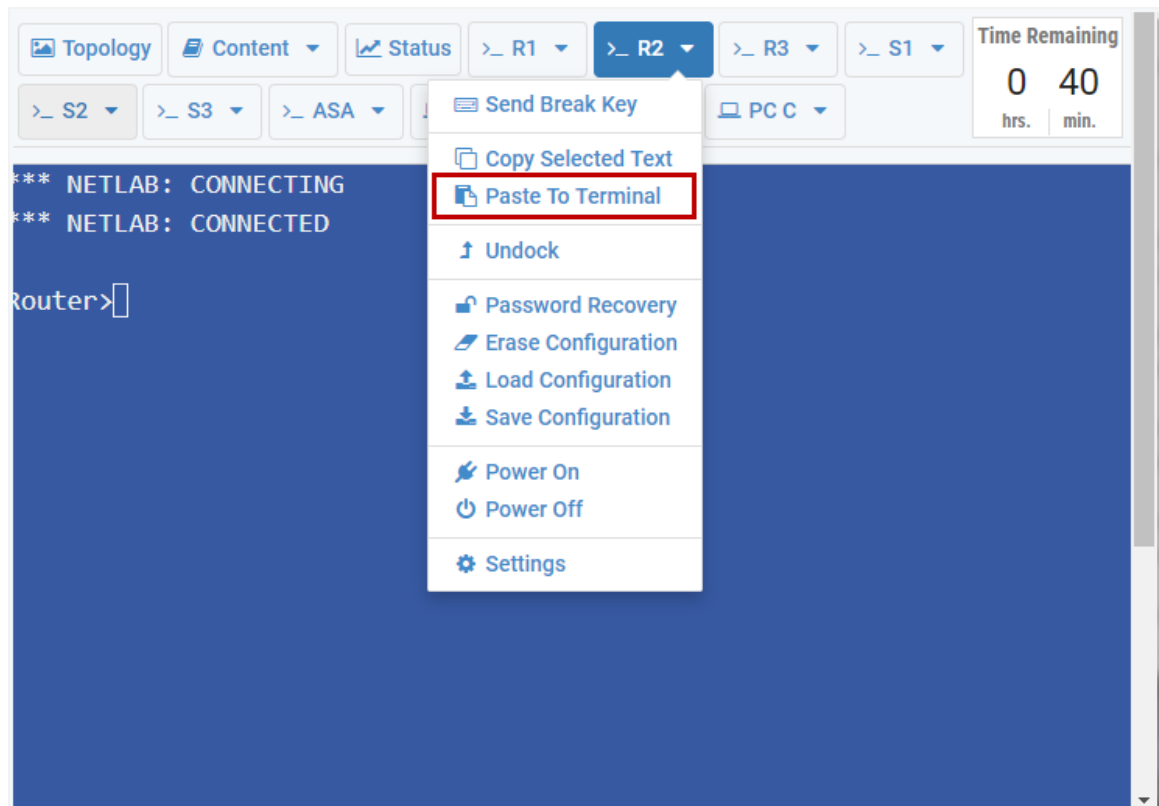
4.2.2 Paste to Terminal

The Paste to Terminal option is used in order to paste configuration text to a device's terminal.

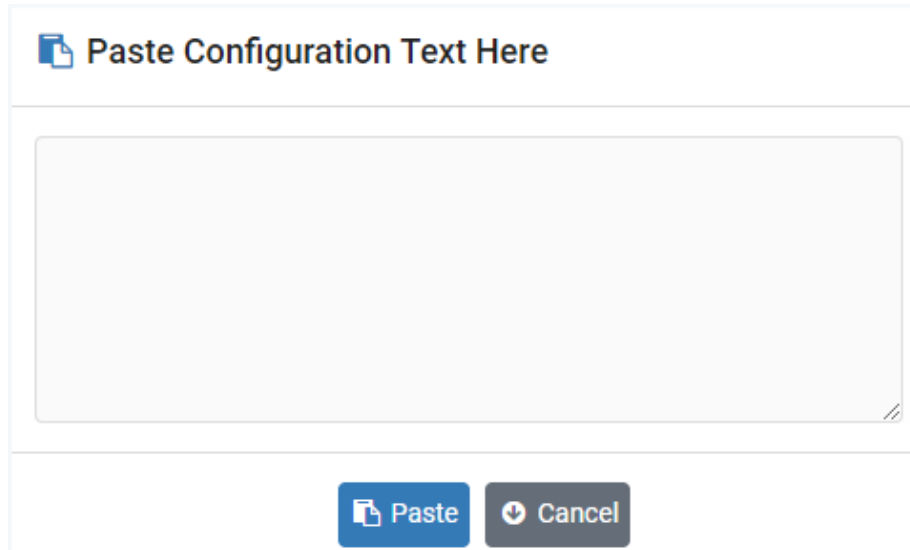


Using the Paste to Terminal option is recommended to avoid issues of over-running the text buffer that could occur if you were to paste directly from the clipboard.

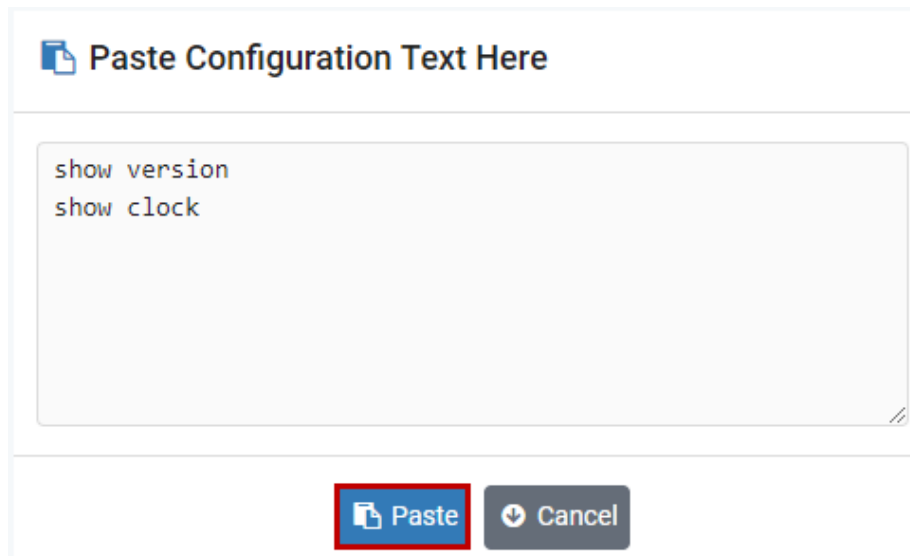
1. Click the **Paste To Terminal** option on the device tab.



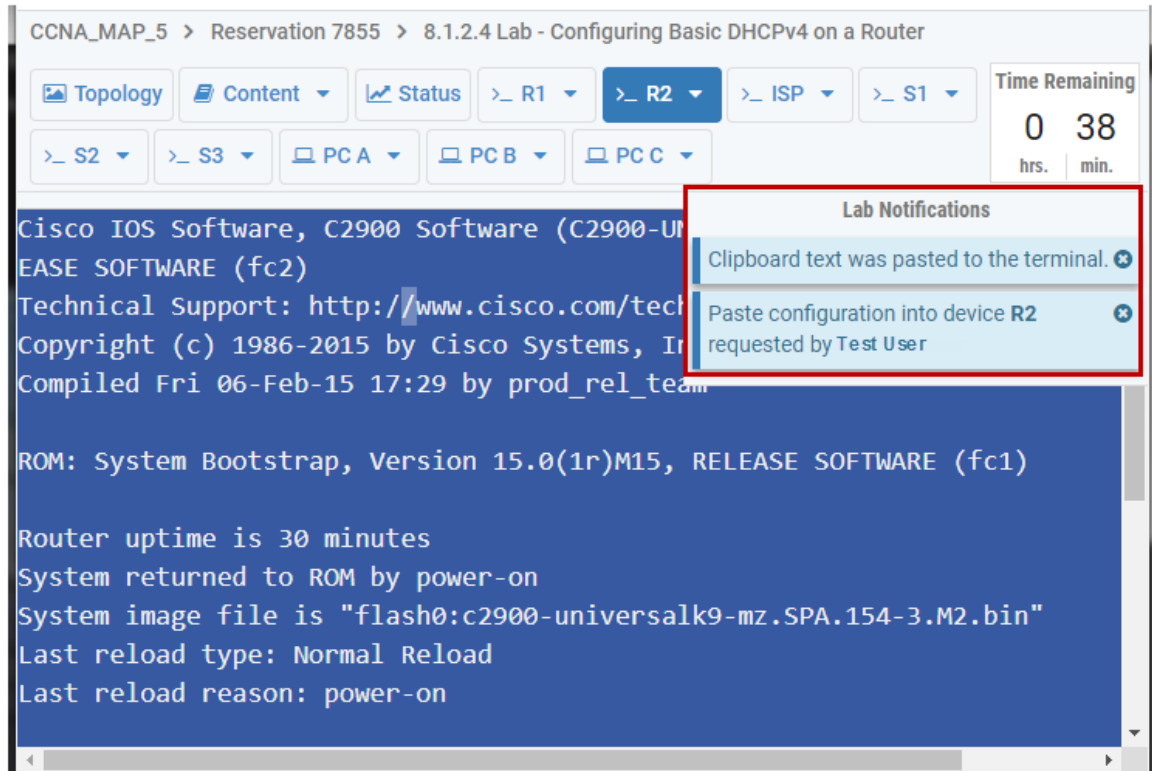
- The Paste Configuration Text window will appear. You may paste configuration text copied from the application of your choice. To paste from the clipboard, Windows users can typically use **CTRL+V** or **Right-click > Paste**. Your options for pasting may vary, depending on your system selections and settings. While the text window is not designed to be a fully functioning text editor, the basic utility to type and edit configuration text in the window is provided.



- Click **Paste** to paste the text you placed in the window to the device's terminal.



- Lab notifications will be displayed, indicating that the configuration text was pasted to the device by the user. The terminal will show the resulting output.



The screenshot displays a virtual lab environment. At the top, the breadcrumb navigation shows "CCNA_MAP_5 > Reservation 7855 > 8.1.2.4 Lab - Configuring Basic DHCPv4 on a Router". Below this is a toolbar with buttons for "Topology", "Content", "Status", and device selection dropdowns for R1, R2 (selected), ISP, S1, S2, S3, and PCs A, B, C. A "Time Remaining" counter shows 0 hours and 38 minutes. The main terminal window has a blue background and displays the following text:

```
Cisco IOS Software, C2900 Software (C2900-UNIVERSALK9-M)  
EASE SOFTWARE (fc2)  
Technical Support: http://www.cisco.com/techsupport  
Copyright (c) 1986-2015 by Cisco Systems, Inc.  
Compiled Fri 06-Feb-15 17:29 by prod_rel_team
```

ROM: System Bootstrap, Version 15.0(1r)M15, RELEASE SOFTWARE (fc1)

Router uptime is 30 minutes
System returned to ROM by power-on
System image file is "flash0:c2900-universalk9-mz.SPA.154-3.M2.bin"
Last reload type: Normal Reload
Last reload reason: power-on

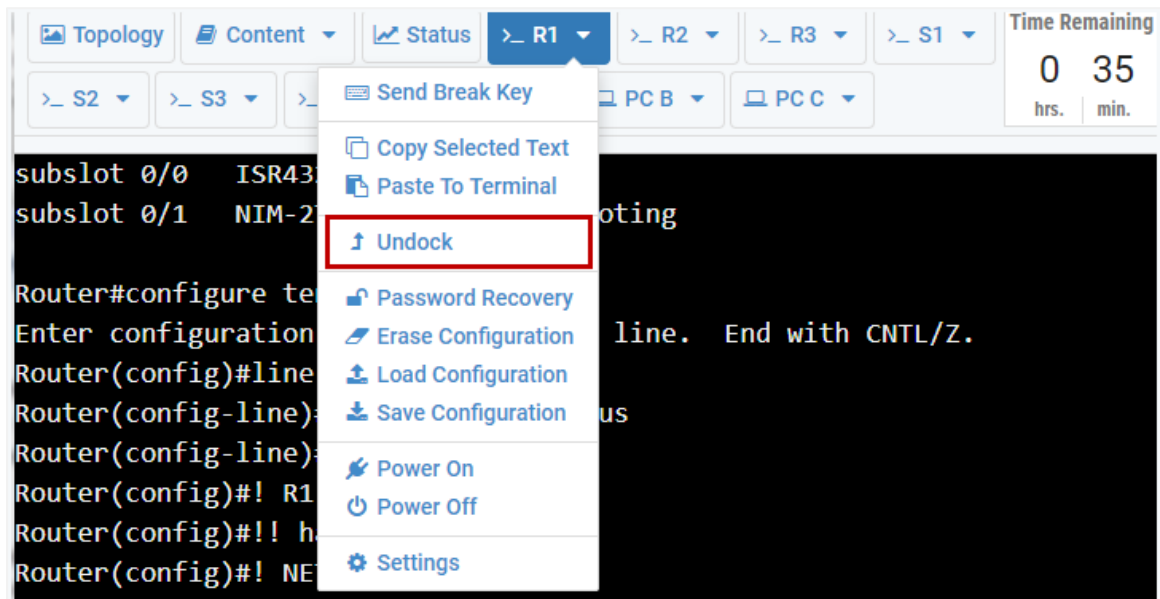
A "Lab Notifications" popup is overlaid on the terminal, containing two messages:

- Clipboard text was pasted to the terminal.
- Paste configuration into device R2 requested by Test User

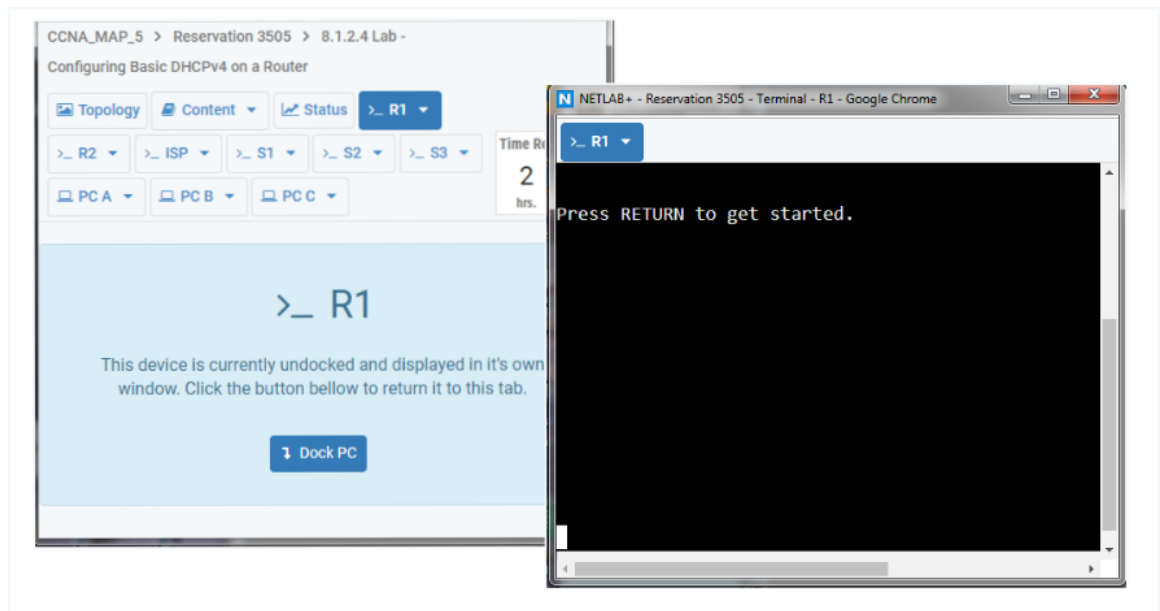
4.2.3 Undock and Dock Device Windows

You may find it helpful when organizing your workspace to have the terminal windows for several devices arranged so that you may conveniently view and easily access all of them. You may **Undock** any lab device to have the terminal displayed in its own window.

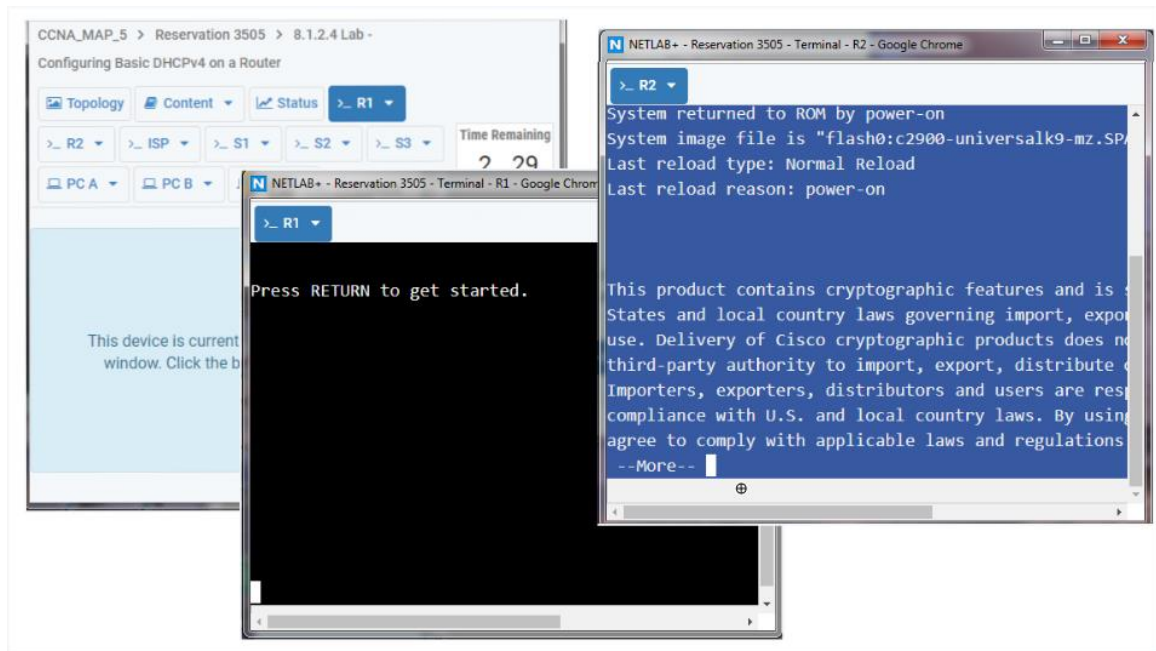
1. From the lab device tab (R1, in this example), select the option to **Undock** the device display.



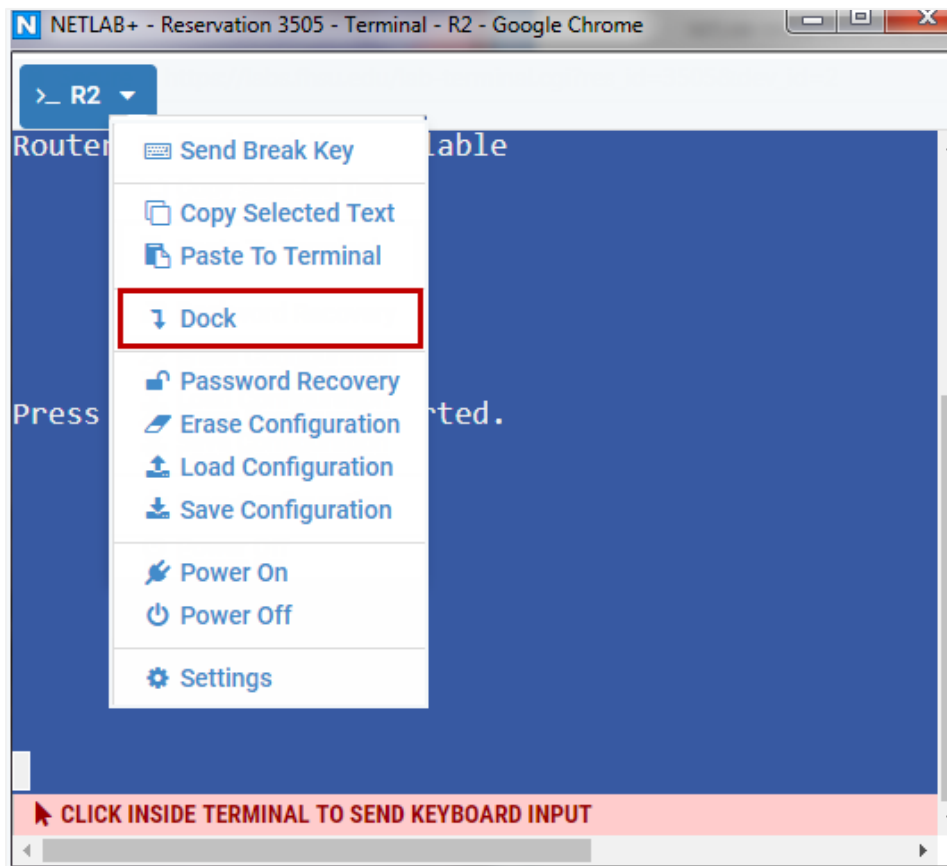
2. The R1 device tab indicates the device is currently undocked and displayed in its own window. You may move and resize the R1 window to suit your needs.



3. Select the option to undock the R2 device. Notice the background color of R2 is different from R1, allowing you to distinguish between the windows easily.



4. To dock the terminal display back to the device tab, select the **Dock** option on the device window.



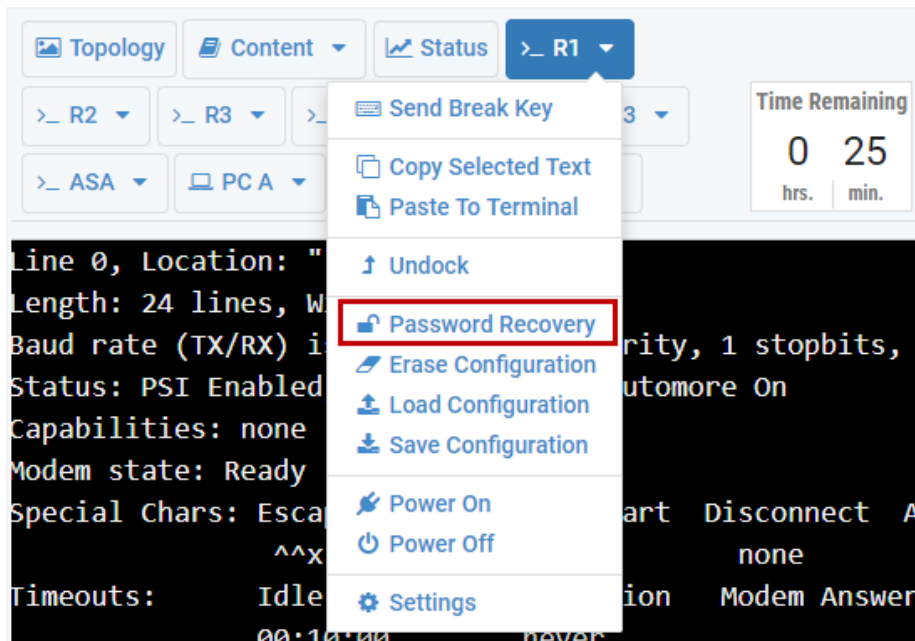
4.2.4 Password Recovery

The password recovery option will attempt to remove the console and enable passwords from the device.

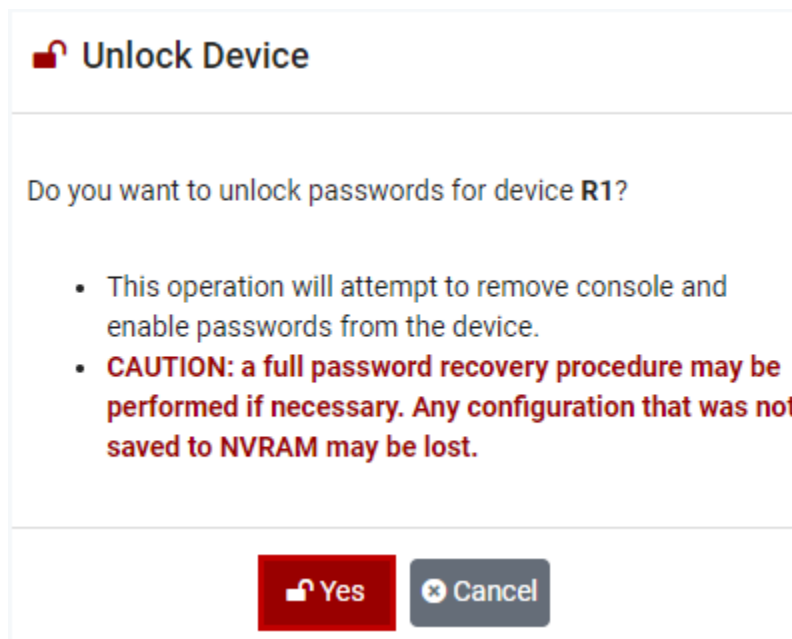


During Instructor-led training sessions, the option to perform password recovery may be executed by the instructor, but not by students.

1. Select the Password Recovery option on the device tab.



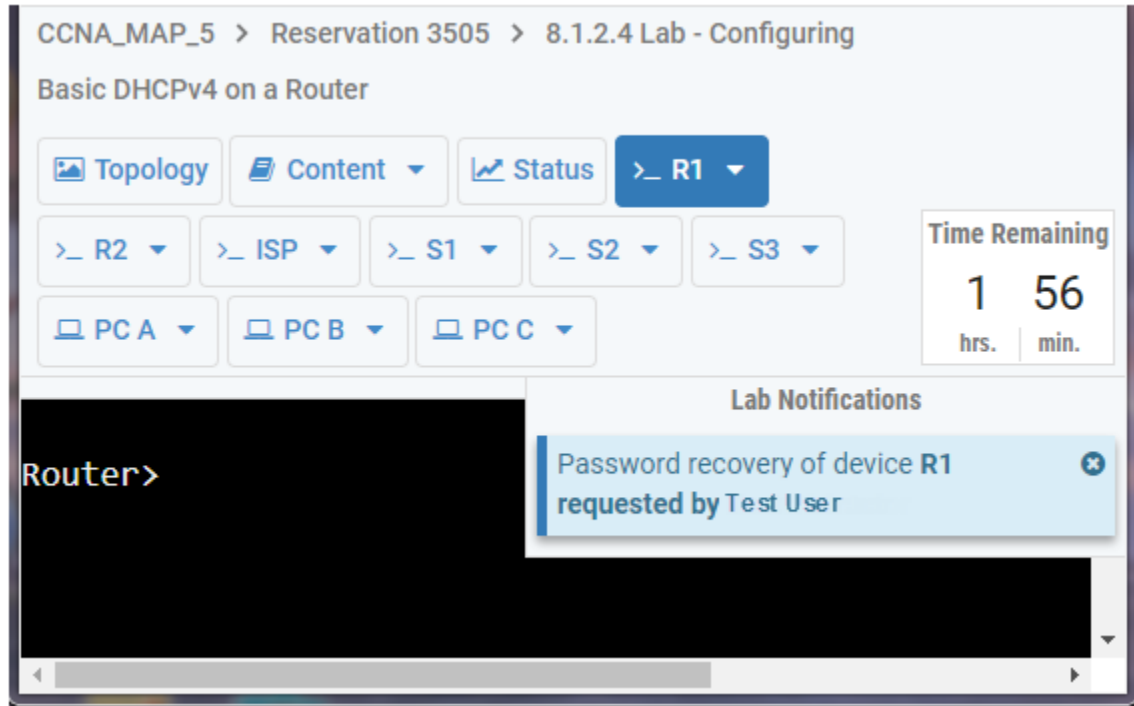
2. Select **Yes** to confirm that you want to unlock the passwords for the device.



3. A lab notification message will be displayed, indicating that password recovery has been requested.



Lab notification messages are displayed to all users sharing the reservation (such as, for instructor-led training).



The screenshot displays the NETLAB+ interface for a lab titled "Basic DHCPv4 on a Router". The breadcrumb navigation shows "CCNA_MAP_5 > Reservation 3505 > 8.1.2.4 Lab - Configuring". The interface includes several control buttons: "Topology", "Content", "Status", and a dropdown menu for "R1". Below these are dropdown menus for "R2", "ISP", "S1", "S2", and "S3", and another row for "PC A", "PC B", and "PC C". A "Time Remaining" box shows "1 hrs. 56 min.". A "Lab Notifications" panel is open, displaying a message: "Password recovery of device R1 requested by Test User". The main terminal area shows "Router>" on a black background.

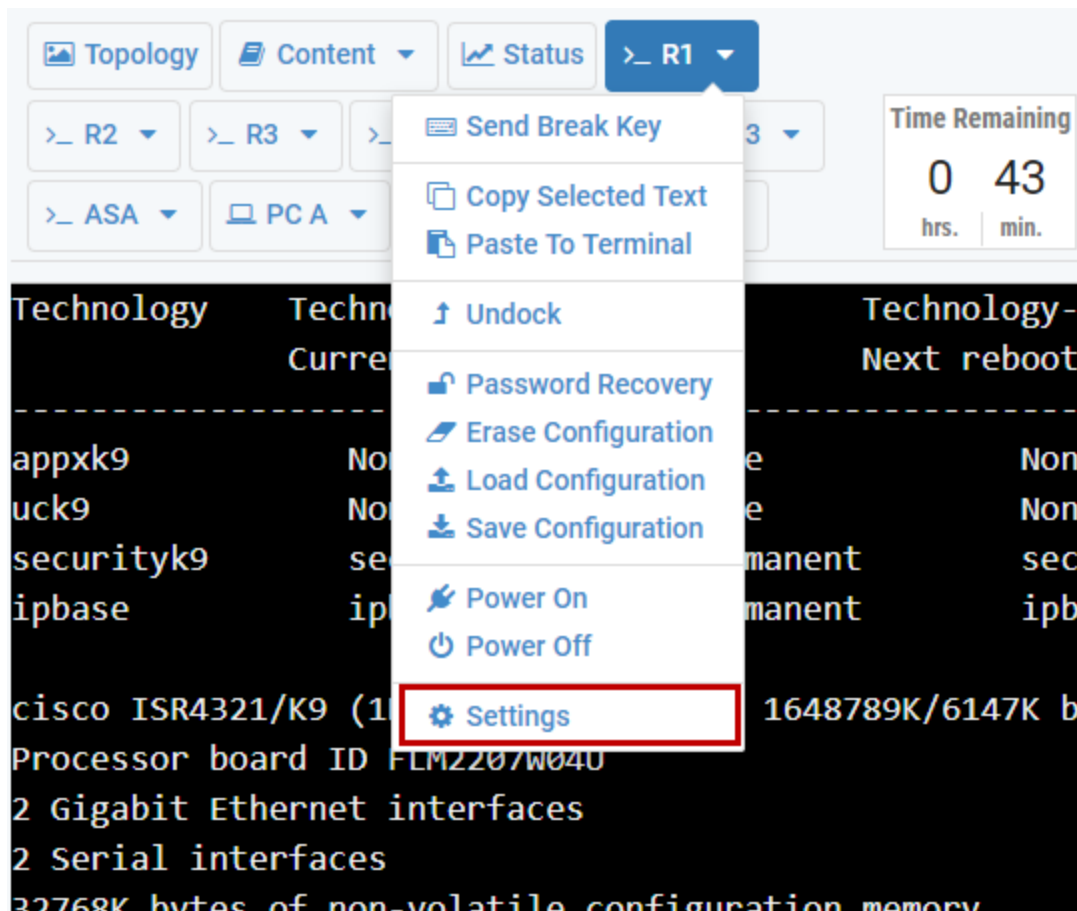
4.2.5 Terminal Settings

Customize the appearance of your device's terminal by selecting settings for background color, text color, and font size.

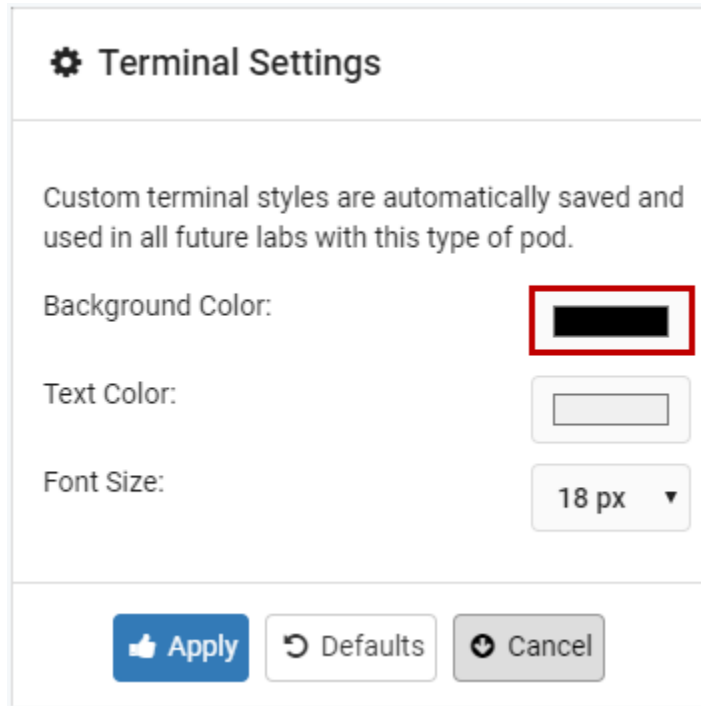


Changing the background and font colors to your own custom selections can help you easily differentiate between multiple device windows. You may set your font size to what works best for you to read and use efficiently.

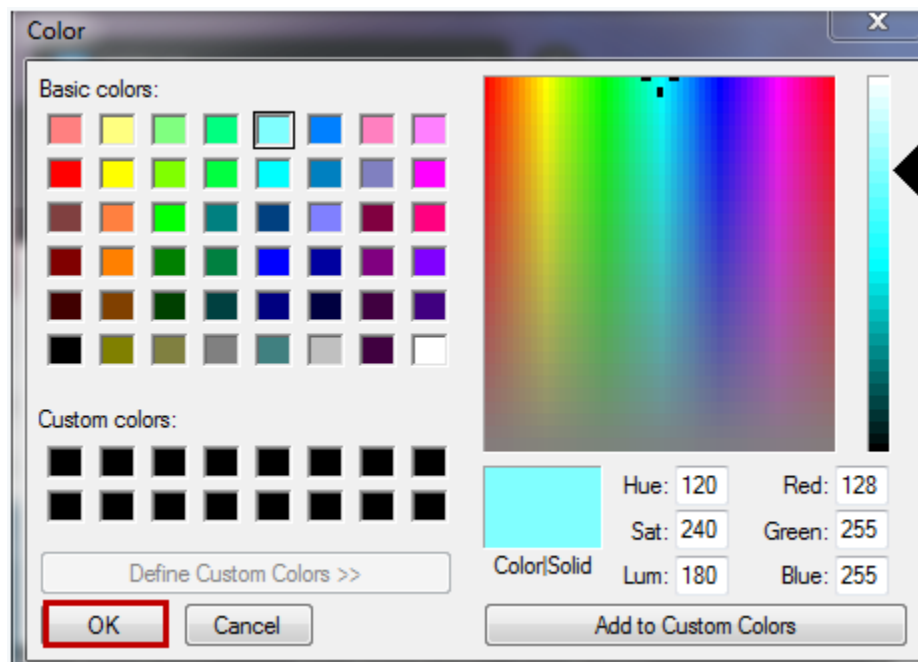
1. Select the **Settings** option on the device tab.



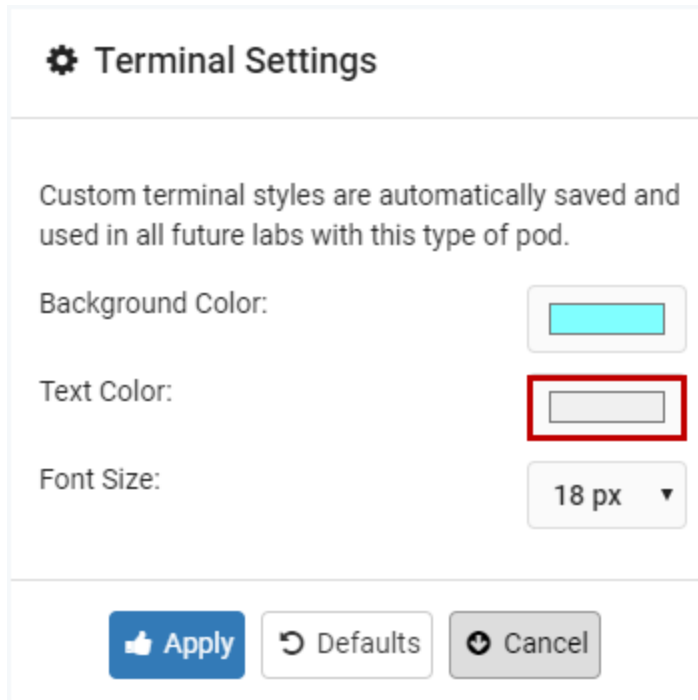
- The Terminal Settings popup window will be displayed. To change the background color of the terminal, click the rectangle displaying the current background color.



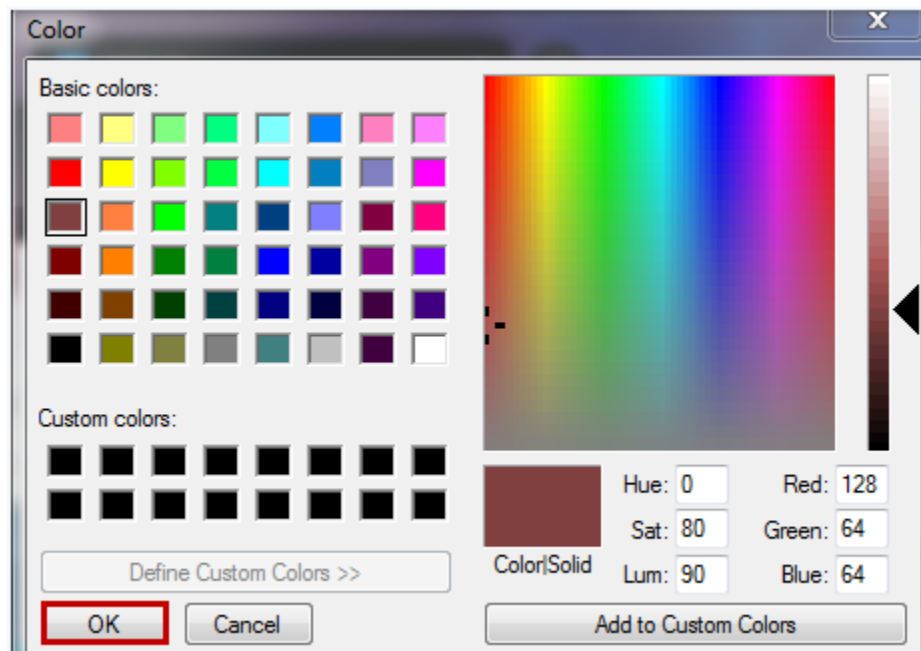
- A color selection window will appear. You may select a basic or custom color for the background of your CLI viewer. In this example, we will select one of the basic colors. After selecting a color, click **OK**.



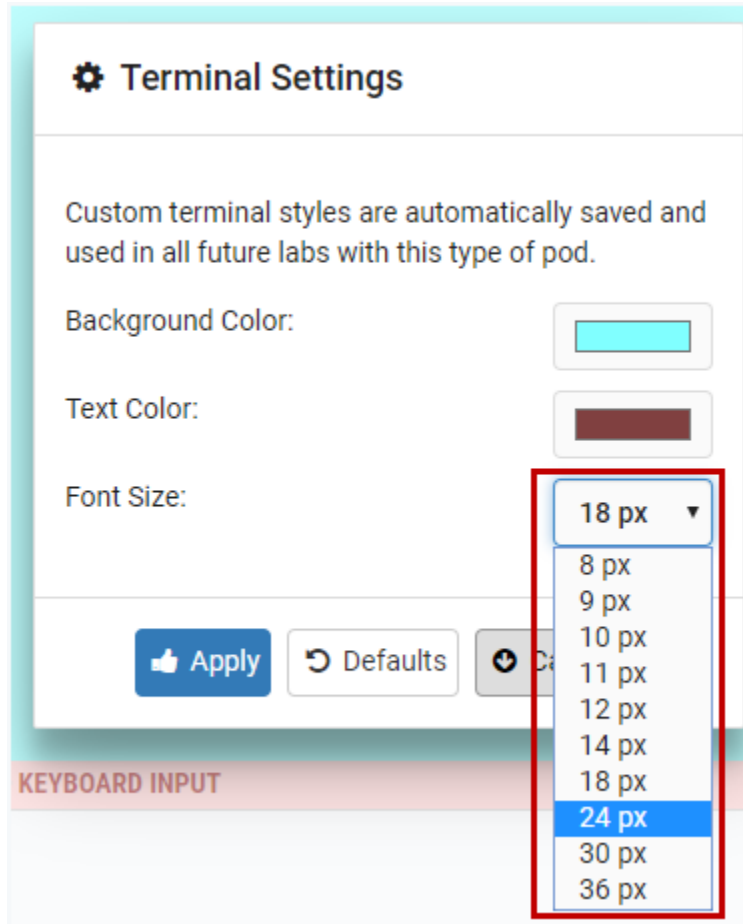
- To change the text color, click the rectangle displaying the current text color.



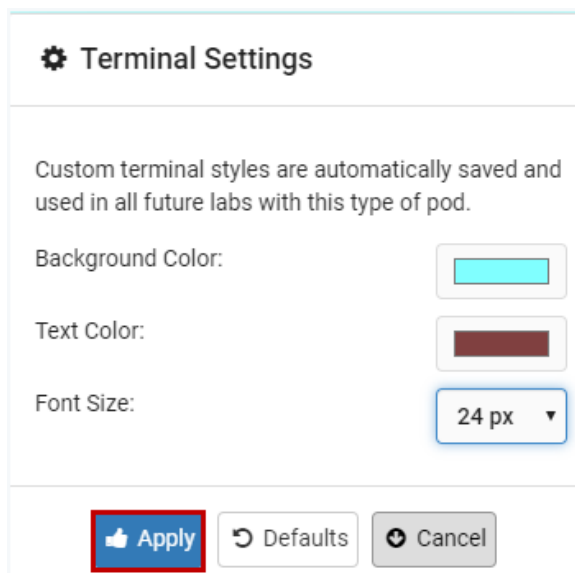
- A color selection window will appear; you may select a basic or custom text color and then click **OK**.



- To change the font size, click the dropdown showing the current font size and select the font size of your choice.



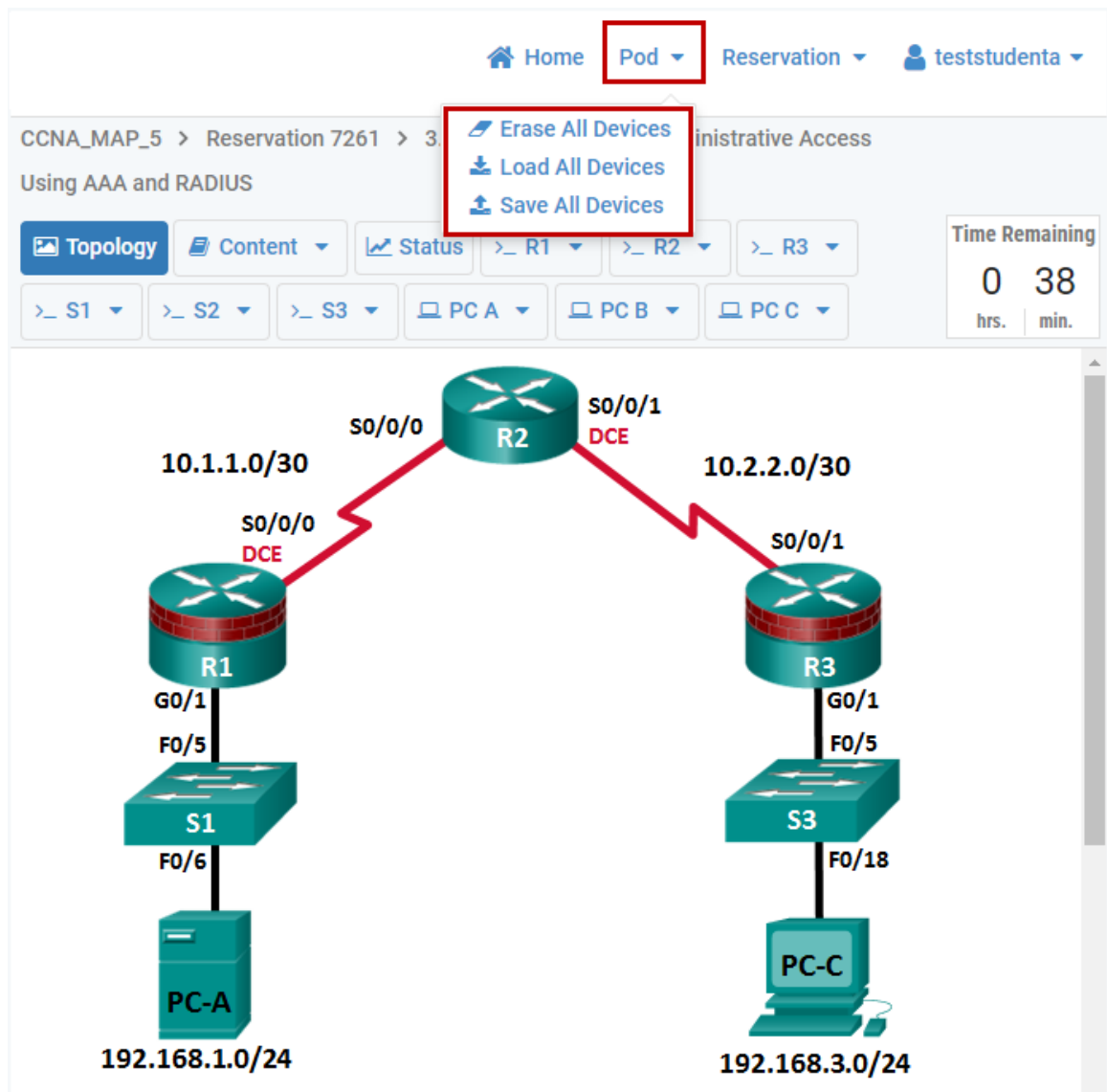
- To apply your selections and exit the Terminals Settings window, click **Apply**. Your settings will be saved and used for future reservations using the same type of pod. You may return to the default settings by selecting Defaults on the terminal settings window.



4.3 Pod-wide Device Automation

Lab reservations using pods with lab devices (console-based devices such as Cisco routers, switches, and firewall devices) include the Pod menu option on the lab interface. The pod options allow all the configurations of all lab devices in the pod to be erased, loaded, or saved at once.

1. Select the **Pod** menu option on the lab interface.
2. Select an option to either **Erase**, **Load**, or **Save** the configurations of all of the lab devices in the pod. Please see the [Manage Configuration Files](#) section for details on using and managing configuration files.



4.4 Screenshots of Remote PCs

In this section, we will demonstrate the Screenshot feature, which allows users to take screenshots of remote PCs in the topology during a lab session. These screenshots are included in the lab history where you can [View Completed Labs](#).



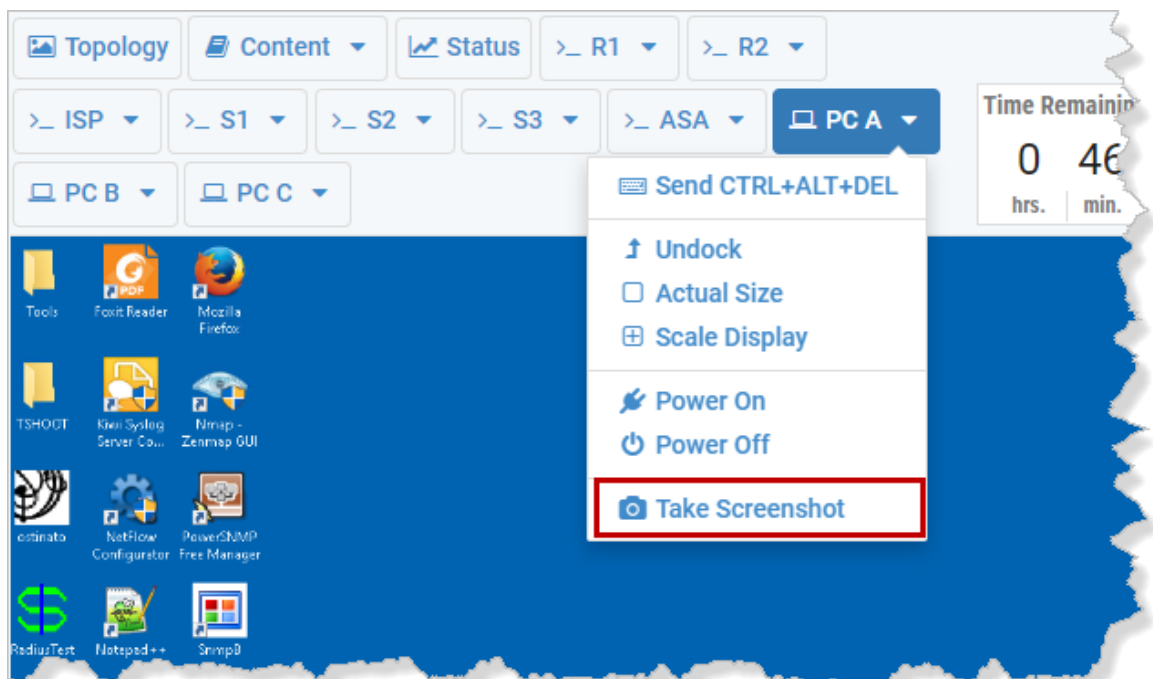
The Screenshot feature is available to users only if it has been enabled at the community level by the NETLAB+ administrator. For each class in a community where the screenshot feature has been enabled, the maximum number of screenshots that students may take in a single lab is set by the Administrator or Lead Instructor. If this value has been set to 0, it effectively disables the screenshot feature for a class.



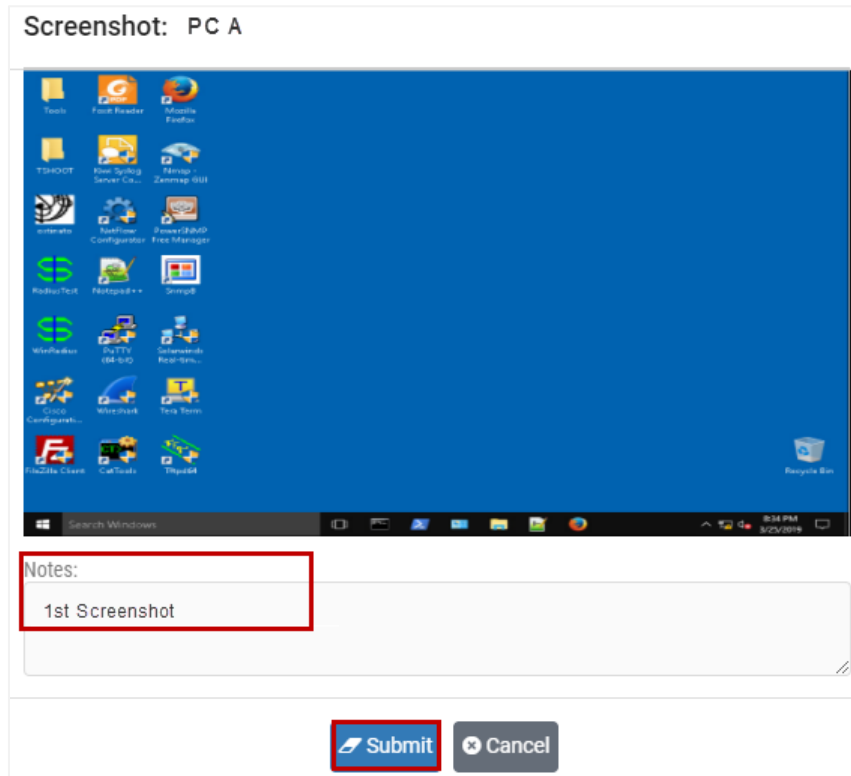
You may be directed by your instructor to take screenshots of your progress during a lab reservation or you may want to take screenshots for your own reference. The screenshots will be available to view through the Completed Labs function, available from the View menu option. See the [View Completed Labs](#) section for details.

To take a screenshot, perform the following steps:

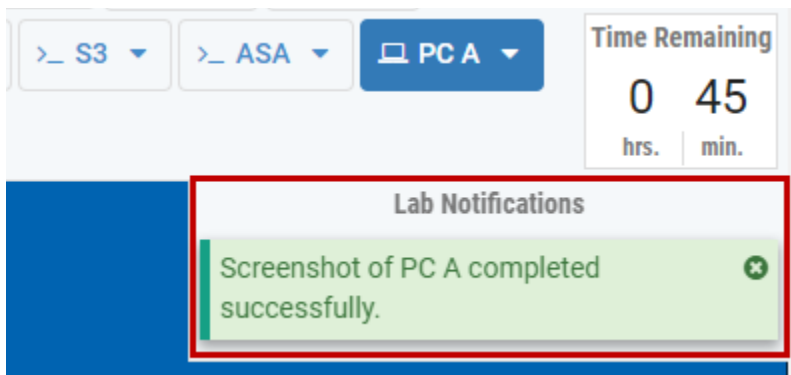
1. Click on the tab for the remote pc (*PC A*, in this example) and select the **Take Screenshot** option.



- The screenshot popup page will appear, showing the screenshot that you have captured. Adding a brief description in the optional Notes field is recommended. Click **Submit**.



- A lab notification will briefly appear, showing that the screenshot was completed successfully. You may continue to take screenshots of the remote PCs throughout your lab session. The screenshots will be included as part of the lab history, available to view from the View menu option. See the [View Completed Labs](#) section for details.



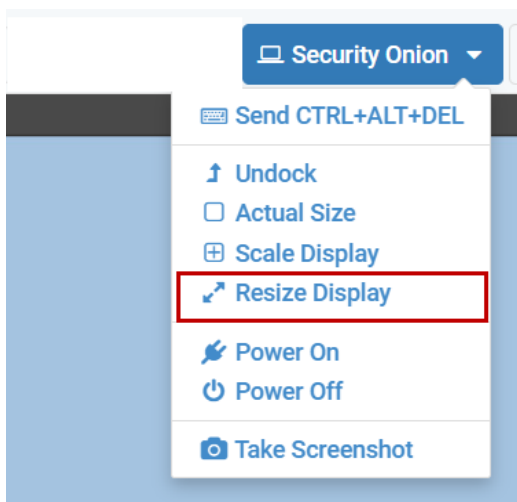
4.5 Display Sizing Options for Remote PCs



Options for adjusting the display for remote PCs include **Actual Size** and **Scale Display** to adjust the size of the output displayed in the window, relative to the size of the viewer window. The options available to you may also include the **Resize Display** option. Availability of this option depends on several factors, including configuration settings selected by your NETLAB+ Administrator.



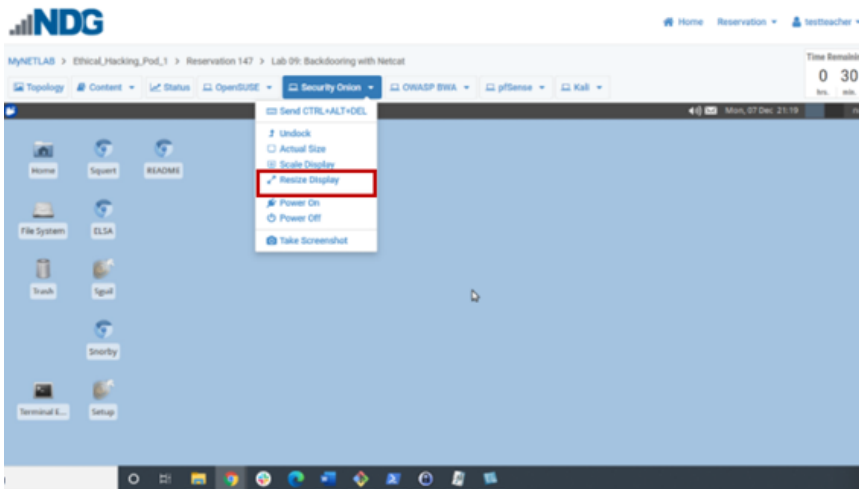
If available on your system, Resize Display functions only for individual lab reservations (student or instructor); it is not available during instructor-led training or team reservations.



Resize Display is particularly helpful to use after entering full-screen mode (select F11 if using Windows) since it will enable you to make use of the entire screen's "real estate" as the working area.




Be aware that in some cases (depending on the selected OS and other VM settings), the Resize Display option will not function until the user has first performed their initial login to the VM, as per the instructions provided in the lab content.



4.6 Extend a Reservation

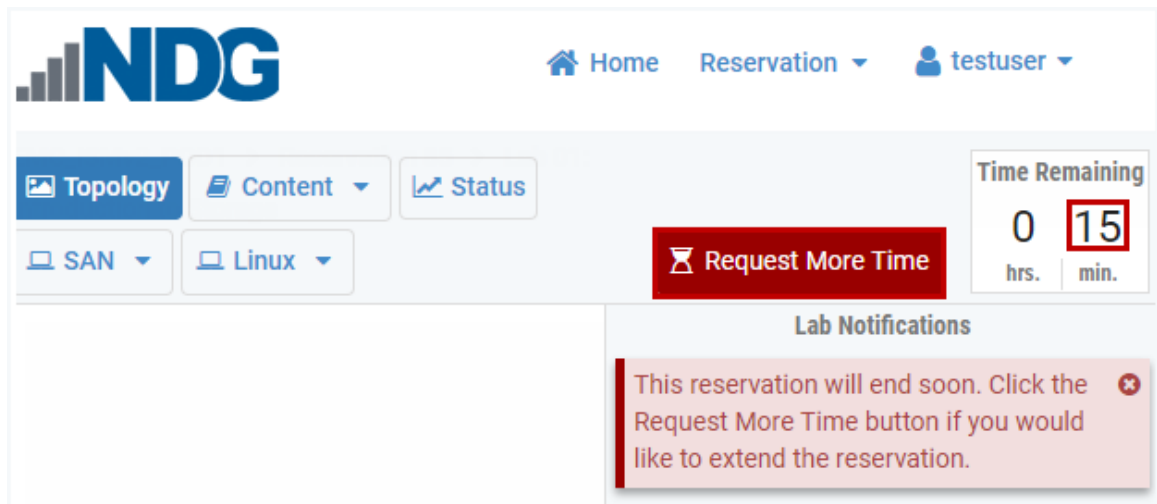
The option to extend a reservation allows the user to request 30 additional minutes of lab time. The request to extend a reservation may be made by the user when the Time Remaining in the lab interface shows 15 minutes or less.



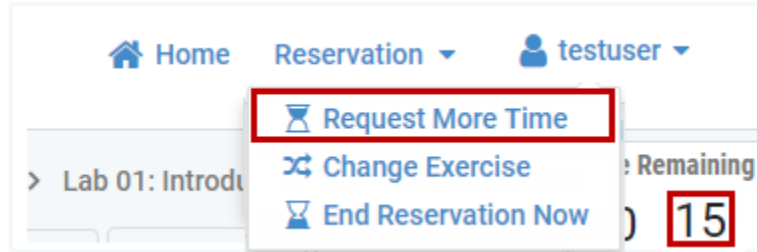
In some cases, a lab reservation extension will not be available due to restrictions. Please refer to the restrictions listed below that affect the availability of lab reservation extensions.

To request a reservation extension, perform the following steps:

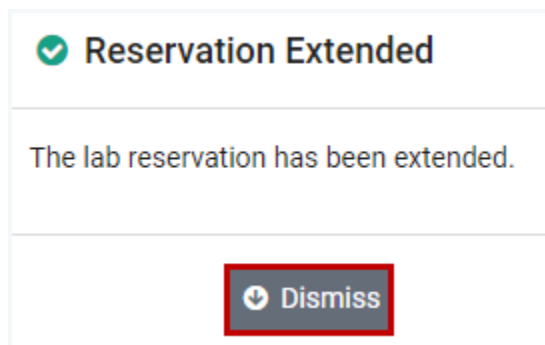
4. If a reservation extension is available, the option to **Request More Time** will appear when the time remaining in the lab interface shows 15 minutes or less.



Alternatively, the option to request more time is available by selecting **Reservation > Request More Time**.



5. A confirmation message will indicate the lab reservation has been extended. Click **Dismiss**.



Restrictions for All Users

- An extension cannot be made before T-00:15 on the displayed Time Remaining. This is about 26 minutes from the blocked end time and 16 minutes of the usable time remaining.
- The next 30-minute time slot must not be already scheduled by another reservation.
- The extension cannot exceed the maximum pods in use limit and/or proactive resource awareness settings that have been set by the NETLAB+ Administrator.

Restrictions for Students and Teams

- The number of extensions that a student or team can request is limited by community and class settings.
- For backward setting compatibility, communities and classes do not allow extensions to be made by students or teams by default.
 - The Administrator must specifically allow extensions for students and teams per community.
 - The instructor must specifically allow extensions for students and teams per class.
- A learner may not extend an ILT reservation. Only a lead instructor can extend an ILT reservation.

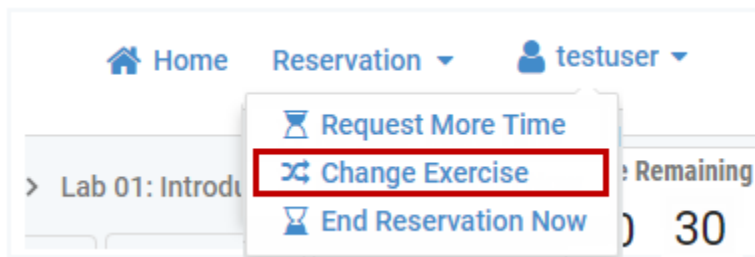
4.7 Switch to a Different Lab Exercise

If you have completed all the activity associated with the current lab exercise, you may choose to continue your session using a different lab exercise.

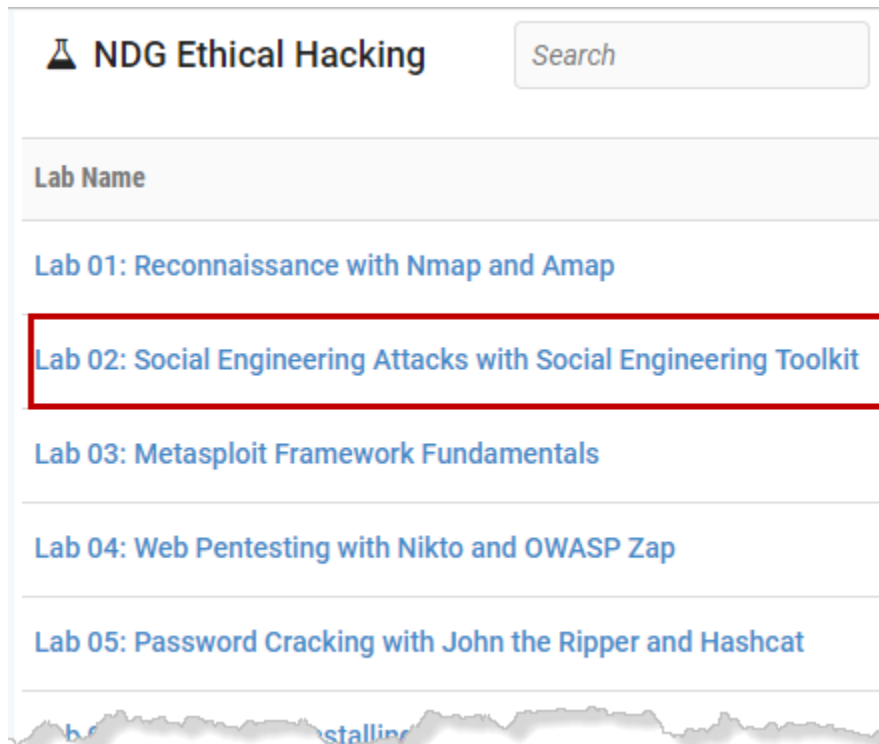


In some cases, the option to change the lab exercise will not be available. This option will only be available if the class setting to use multiple labs in the same reservation has been enabled by the lead instructor.

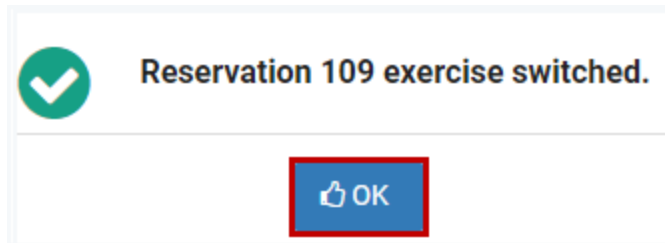
1. Click Reservation on the top menu bar and select the option to **Change Exercise**.



2. A list of lab exercises associated with the class will be displayed. Select a lab exercise by clicking the lab name.



3. A message will confirm that the lab exercise has been switched. Click **OK**.



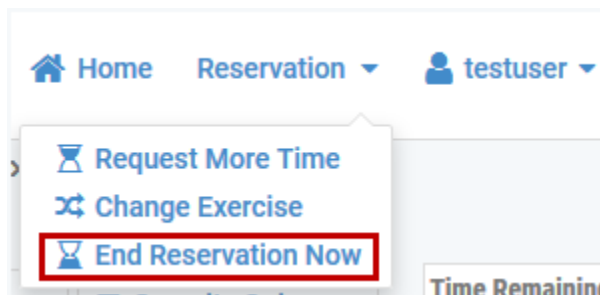
4.8 End a Reservation

When a lab reservation time expires, all connections will be dropped. A reservation may also be ended prior to the scheduled time.

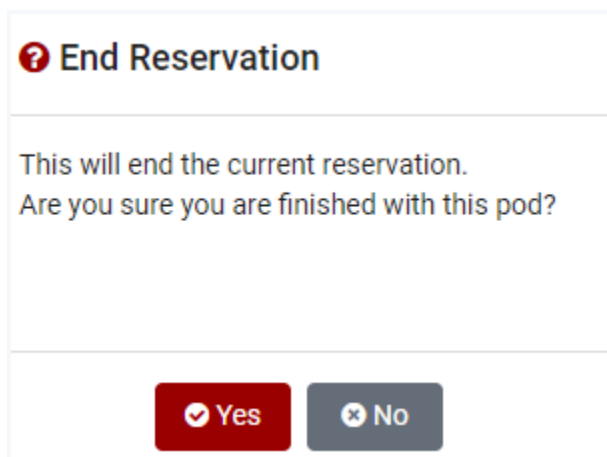


During Instructor-led training sessions, the option to end the reservation may be executed by the instructor, but not by students.

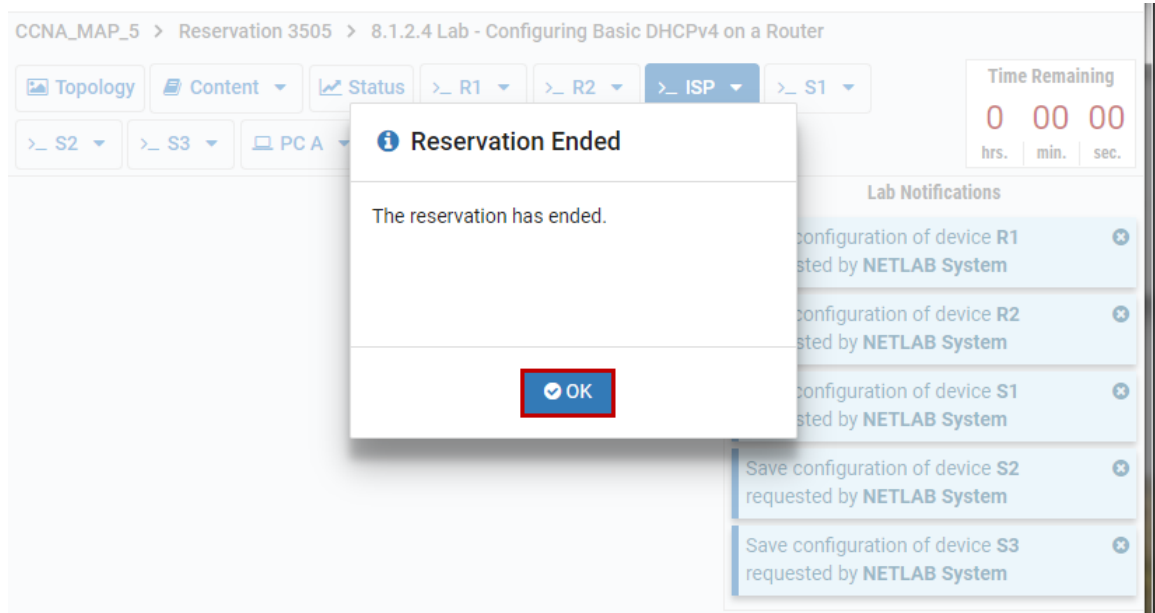
1. Select Reservation at the top of the page and click **End Reservation Now**.



2. Respond **Yes** to the prompt if you are finished with the pod. (Or, select **No** to return to the pod.)




3. A message will display, indicating the reservation has ended. A similar message is displayed if the reservation ends at the scheduled end time. Notice the lab notification messages in the background, indicating device configurations are being saved. The lab session will end immediately. Select **OK**, and your display will return to the MyNETLAB page.



The scheduler will be updated to include any unused time increments of thirty minutes or more to be available for reservations.

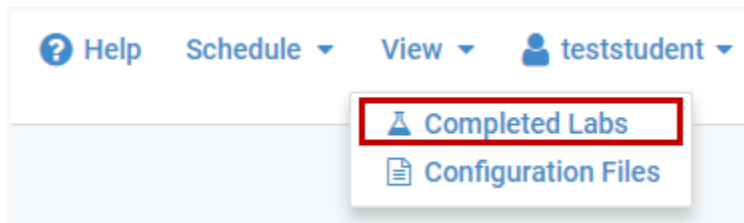
5 View Completed Labs

To review details of the lab reservations you have completed in NETLAB+, perform the following steps.



Unattended labs are not included in the list of completed labs.

1. From the MyNETLAB home page, click the View option and select **Completed Labs**.



2. A list of the labs you have completed is displayed. You may sort the data in ascending/descending order by clicking any of the header fields. In the example below, the data is sorted by Exercise. You have the option of exporting this data by selecting **Export**.

Lab Usage: Search

User ID	Name	Reservation	Exercise	Start Time	Hours Attended
teststudent	Ndg, Teststudent	68	Lab 01: Introduction to Storage	2017-12-08	0.65
teststudent	Ndg, Teststudent	48	Lab 01: Introduction to Storage	2016-12-19	0.73
teststudent	Ndg, Teststudent	69	Lab 02: Overview of RAID	2017-12-11	0.62
teststudent	Ndg, Teststudent	71	Lab 03: Overview of LUNs	2017-12-14	0.72
teststudent	Ndg, Teststudent	70	Lab 03: Overview of LUNs	2017-12-11	0.70
teststudent	Ndg, Teststudent	57	Lab 03: Overview of LUNs	2017-08-02	0.18
teststudent	Ndg, Teststudent	73	Lab 04a: Overview of Network-Attached Storage	2017-12-15	0.30
teststudent	Ndg, Teststudent	72	Lab 04a: Overview of Network-Attached Storage	2017-12-14	0.77
Page Total:					4.67
Table Total:					4.67

Show 25 entries Showing 1 to 8 of 8 items < 1 >

Dismiss Export

- The data has been exported to a file, **lab_usage.csv**. Locate the file in your computer's downloads folder (the folder name may vary depending on your preferences and settings). The file can be viewed with a spreadsheet program or text editor.

lab_usage.csv

	A	B	C	P	Q	R
1	acc_display_name	acc_email	acc_full_name	ex_id	ex_name	lh_uuid
2		teststudent@example.e	Test Student	EMCISMV2	Lab 01: Introduction to Storage	ba2944be-ab2b-
3	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 01: Introduction to Storage	63c27d00-e175-
4	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 01: Introduction to Storage	8d3ca2c8-0fd6-4
5	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 03: Overview of LUNs	c171fab5-b0c8-4
6	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 01: Introduction to Storage	a18592db-a44c-
7	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 02: Overview of RAID	8956b941-abd6-
8	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 03: Overview of LUNs	82e54edf-52de-4
9	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 03: Overview of LUNs	f4a0d0c9-e8c4-4
10	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 04a: Overview of Network	2b0ecf24-0e70-4
11	Test Student	teststudent@example.e	Test Student	EMCISMV2	Lab 04a: Overview of Network	1ba36018-0027-
12						

- To see more detail of any reservation on the Lab Usage list, click any of the detail rows. We'll discuss lab history in the next section. Click Dismiss to return to the previous page.

Lab Usage: Cybersecurity Spring 2019

User ID	Name	Reservation	Exercise	Date	Hours Attended
teststudent	Ndg, Teststudent	76	8.1.2.4 Lab - Configuring Basic DHCPv4 on a Router	2019-03-25	0.18
Page Total:					0.18
Table Total:					0.18

5.1.1 Lab History and Screenshots

In the previous section, we discussed how to view a list of labs you have completed. We will now take a look at lab history details.

1. To see the lab history for a reservation listed, click on a reservation detail row.

Lab Usage: Cybersecurity Spring 2019

User ID	Name	Reservation	Exercise	Date	Hours Attended
teststudent	Ndg, Teststudent	76	8.1.2.4 Lab - Configuring Basic DHCPv4 on a Router	2019-03-25	0.18
Page Total:					0.18
Table Total:					0.18

2. The Lab History **Summary** tab will be displayed, showing details specific to the reservation.

Lab History: 8.1.2.4 Lab - Configuring Basic DHCPv4 on a Router

Summary Devices PCs

Community default

Class Cybersecurity Spring 2019

Reservation ID 76

Pod ID 1

Pod Name MAP-ASA-01

Exercise 8.1.2.4 Lab - Configuring Basic DHCPv4 on a Router

Attendees Test Student

Date/Time 2019-03-25 15:28

Duration (Hrs.) 0.18

Dismiss

- If the lab topology includes lab devices (physical devices, such as routers and switches), you will find details of your interaction with those devices on the **Devices** tab. The display options are listed below. Click **Dismiss** to return to the lab list (it may be necessary to scroll down if you are on the Devices tab).

Display Options on the Devices Tab

- **Command Index:** A listing of the commands entered during the lab.
- **Session Logs:** A log of the activity occurring on the selected device.
- **Final Configs:** The configuration file saved by NETLAB+ at the end of the lab session for the selected device.
- **User Configs:** Configuration files saved by the user during the lab session for the selected device.

Here, the **Command Index** has been selected.

🕒 Lab History: 8.1.2.4 Lab - Configuring Basic DHCPv4 on a Router

Summary
Devices
PCs

Time	Display	Device	Command
00:05:37	<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;">Command Index</div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;">Session Logs</div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;">Final Configs</div> <div style="border: 1px solid #ccc; padding: 5px;">User Configs</div>	R3	show version

Partial Log: R3

```
Router>show version

Cisco IOS Software, C2900 Software (C2900-UNIVERSALK9-M), Version 15.4(3)M2, RELEASE SOFTWARE
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2015 by Cisco Systems, Inc.
Compiled Fri 06-Feb-15 17:29 by prod_rel_team

ROM: System Bootstrap, Version 15.0(1r)M15, RELEASE SOFTWARE (fc1)
```

In the example below, the **Final Configs** for device **R3** are displayed.

🔍 Lab History: 8.1.2.4 Lab - Configuring Basic DHCPv4 on a Router

Summary **Devices** PCs

Display **Final Configs** Device **R3**

```
!! NETLAB+ saved configuration: time="2019-03-25 19:40:37 UTC" device="R3" hardware
!
! Last configuration change at 19:39:25 UTC Mon Mar 25 2019
!
version 15.5
service timestamps debug datetime msec
service timestamps log datetime msec
no platform punt-keepalive disable-kernel-core
!
hostname Router
!
boot-start-marker
boot-end-marker
!
!
vrf definition Mgmt-intf
!
address-family ipv4
exit-address-family
!
address-family ipv6
exit-address-family
```

- If the lab topology includes PCs, click on the **PCs** tab to view any screenshots of remote PCs that were captured during the lab session. If more than one PC is included in the topology, select a device on the dropdown (for example, **PC A** is selected below). Thumbnail images are displayed at the bottom of the page. Click on any thumbnail to display the screenshot. You may also scroll through the screenshots using the button controls below the thumbnails.



In the picture below, notice the timestamps under the thumbnails. These indicate the point at which the image was taken as hours, minutes, and seconds from the beginning of lab.

Summary
Devices
PCs

PC

PC A

1st Screenshot


00:05:12

00:08:22

00:10:17

⏮
⏪
⏩
⏭

6 Manage Configuration Files

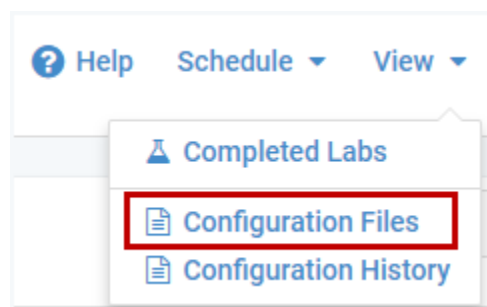
 The File Manager is used to view, add, change, or delete configuration files and folders. NETLAB+ can upload and download configuration files to console-based devices such as routers, switches, and firewall devices in the lab. These files are stored in the NETLAB+ file system. The NETLAB+ file manager provides access to files and folders.

- *Files* contain the actual device configurations.
- *Folders* may contain other folders and configuration files. Folders may be either class (shared) folders or account (specific to the user) folders.
 - The files in the class-shared folder may be accessed by the students enrolled in the class. Students may view files, copy files, and load devices with configuration files and folders. Students do not have access to add, edit, or delete items in the class-shared folder.
 - Account folders may be accessed by the user or by the NETLAB+ Administrator.

6.1 Configuration File Management Outside of a Lab Reservation

Using the File Manager, you can create and edit configuration files and folders. You may find it useful to create a configuration file outside of a lab reservation when you want to practice your router commands or create files to use in later sessions. These files can be created/edited whether or not you have access to a router pod. These configuration files can be saved and later applied to one or more routers in the topology during a lab session.

1. From the MyNETLAB home page, click the View option and select **Configuration Files**.



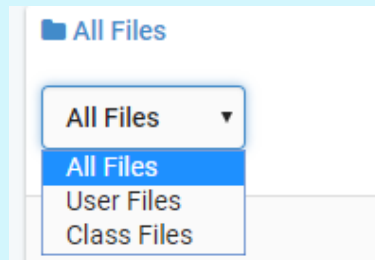
2. A list of folders will be displayed. Notice the list includes an account folder and a class folder for each class in which you are enrolled. In the subsections below, we will show examples of editing a configuration file and creating configuration files and folders.



Students may view files, copy files, and load devices with configuration files and folders. Students do not have access to add, edit, or delete items in the class-shared folder. As a student, you may create and edit files in your account folder.



The default list display is All Files. You may change the display option to filter the list to show User Files or Class Files only.



MyNETLAB > File Manager

All Files
Search

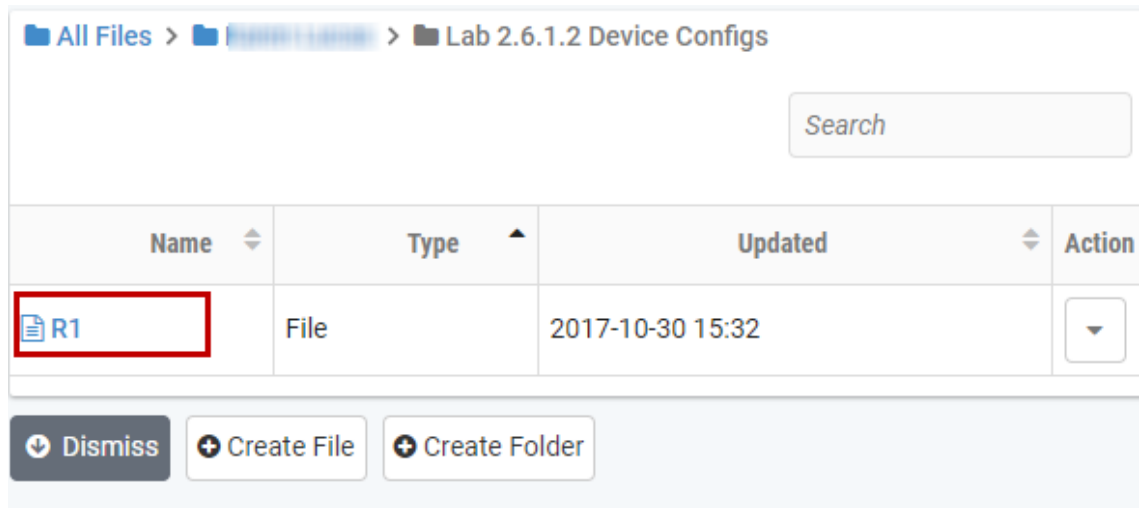
Name	Type
Test User (testuser)	Account Folder
CCNA Routing and Switching Fall 2017	Class Folder
Ethical Hacking Fall 2017	Class Folder

Dismiss

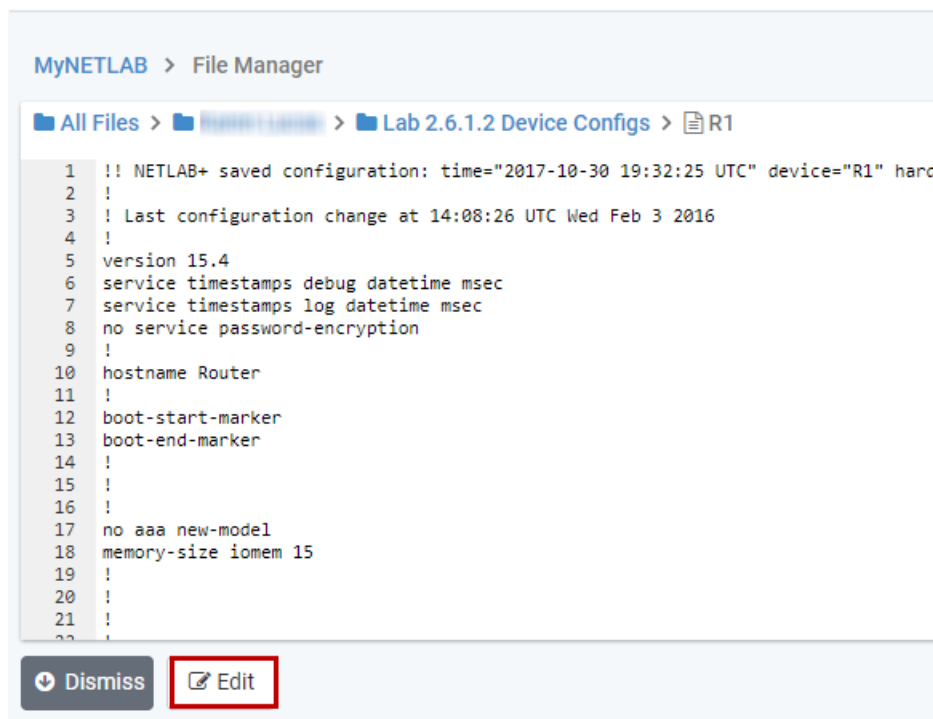
6.1.1 Viewing and Editing Configuration Files

Configuration files may be viewed and edited outside of a lab reservation. Your file can be saved and later applied to one or more lab devices in the topology during a lab session. For the purpose of this example, we assume that the configuration files and folders referenced have been created during a recent lab session (see [Saving Configuration Files During a Lab Reservation](#)).

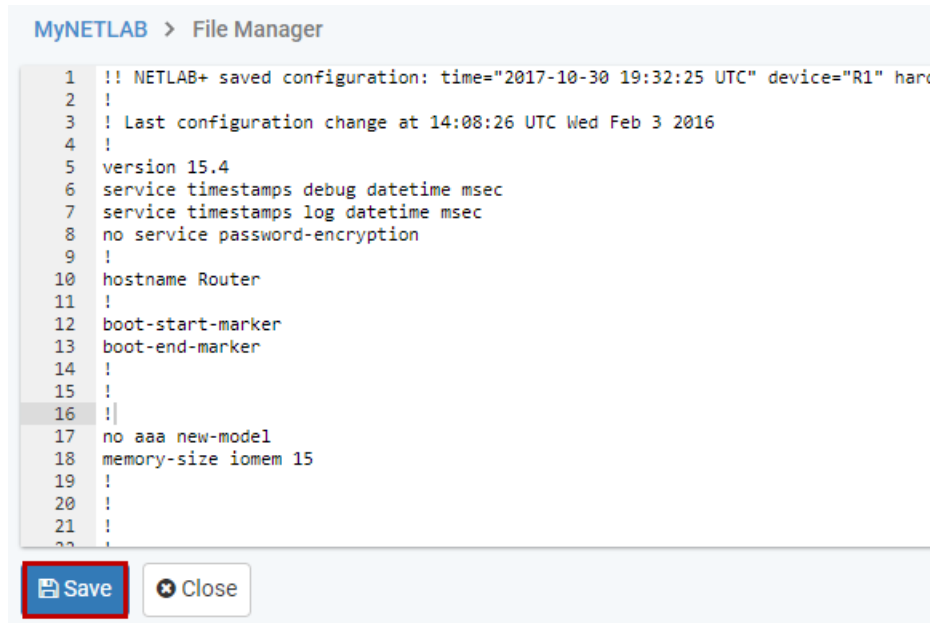
1. Select the *Lab 2.5.1.2 Device Configs* folder and then click the **R1** file to open it.



2. The *R1* file is displayed. For this example, we will not only view the file but also edit it. Click the **Edit** button.



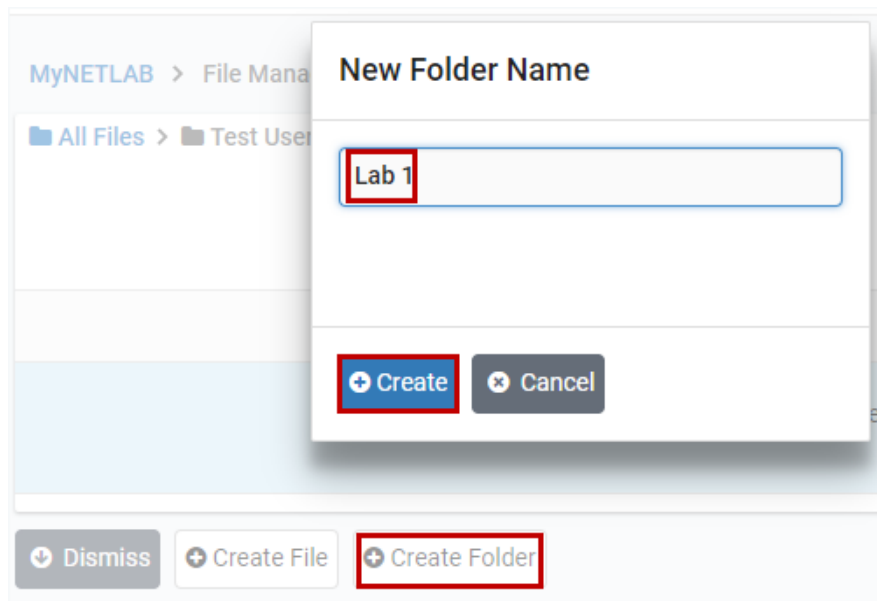
- Click inside the window and edit the file as desired. Select **Save** to save the modified version.



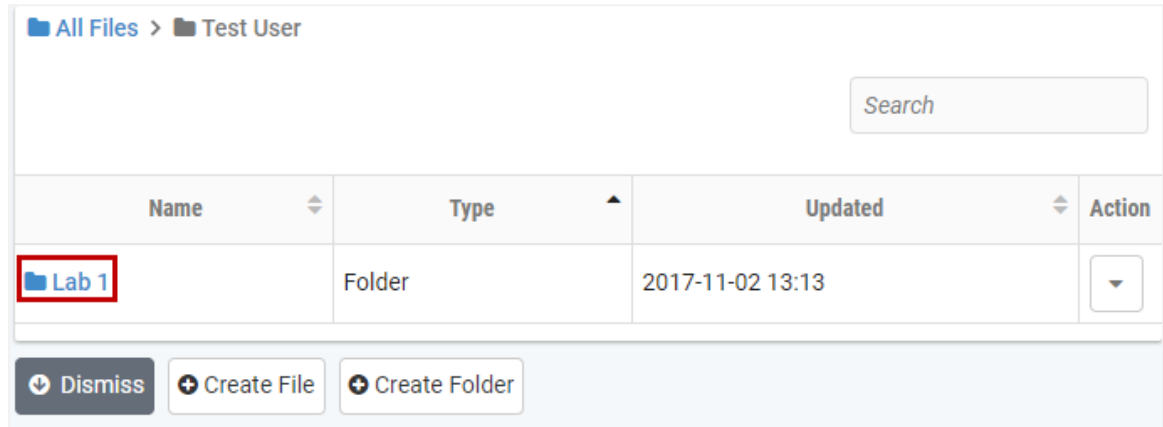
6.1.2 Creating Folders and Files

Configuration files and folders may be created outside of a lab reservation. Your files can be saved and later applied to one or more lab devices in the topology during a lab session.

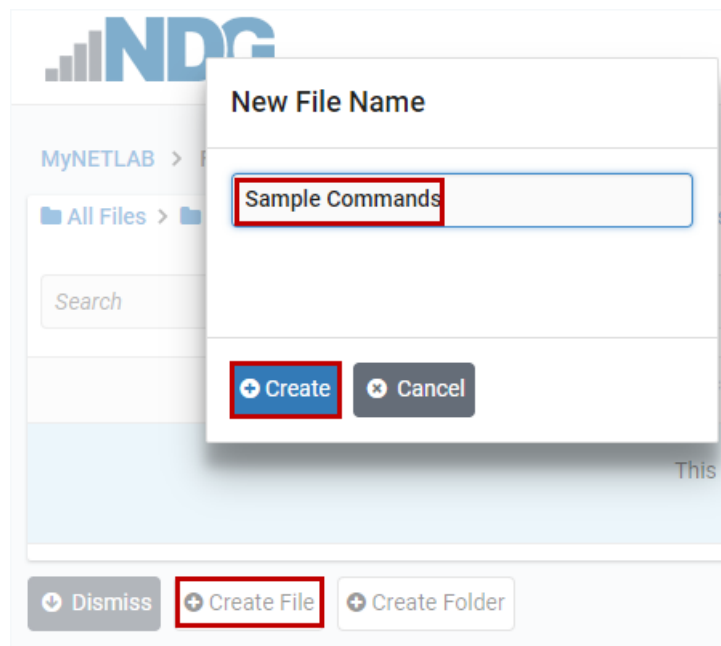
- In this example, we will be creating a folder and configuration file in *Test User's* account folder. To create a subfolder for your file, select **Create Folder**, enter a folder name, and then select **Create**.



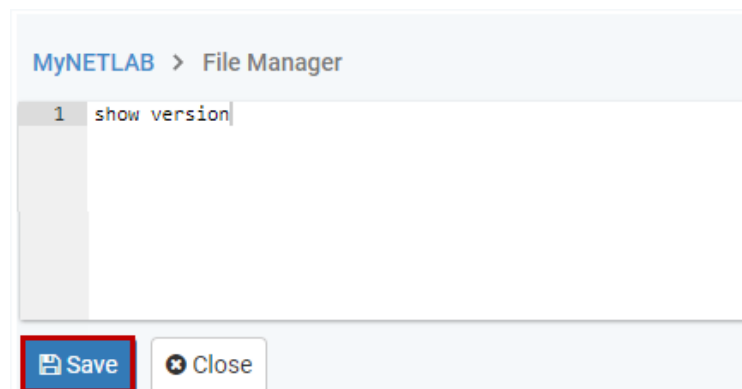
- The **Lab 1** folder will be displayed in the folder list. Click the folder name to select it as the current folder.



- Select the **Create File** button, enter a file name, and then click **Create**.

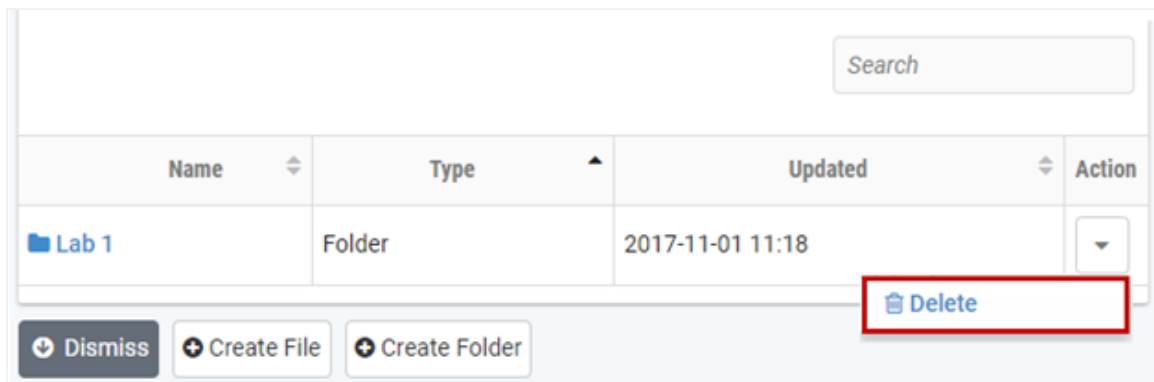


- After entering CLI commands, select **Save** to store the configuration file.



6.1.3 Deleting Folders and Files

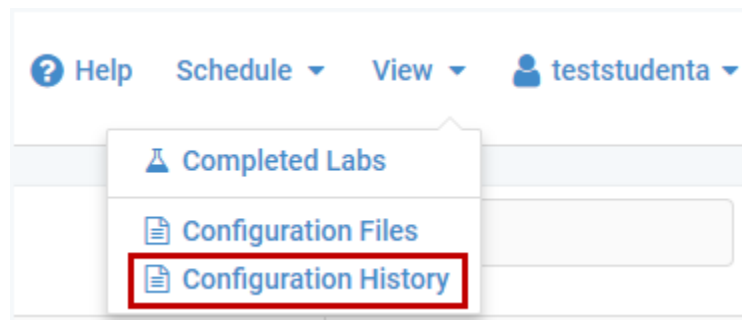
To delete a file or folder in the current directory, click the Action dropdown and select **Delete**.



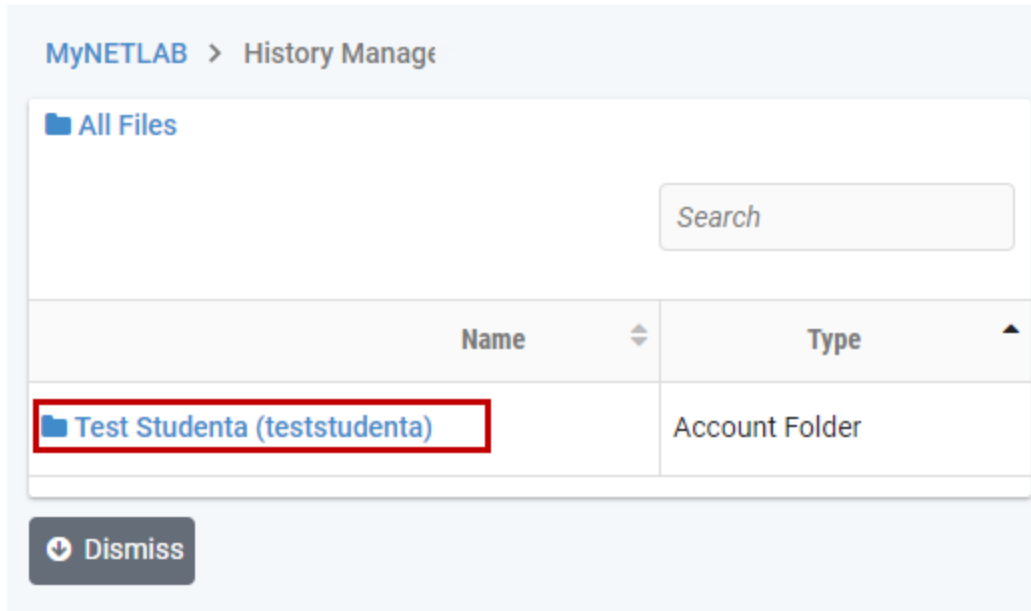
6.1.4 Configuration History

Configuration files for all lab devices in a topology are saved automatically by NETLAB+ at the end of a lab reservation, creating a saved "history". The files are stored in a folder named for the lab exercise. You may view these configuration files outside of a lab reservation.


1. From the MyNETLAB home page, click the Manage option and select **Configuration History**.



- The History Manager will be displayed. Select the account folder.















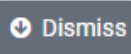
- You will see Config Group folders that contain configuration files that were automatically saved by NETLAB+ at the end of each lab reservation. Select a folder by clicking on the name. In this example, we select the folder from a reservation completed on 2018-06-20, lab exercise 2.6.1.2 (CCNA Security).

 The contents of the page will vary. You may see configuration files that were saved for individual devices. The list may also include folders for other classes and accounts.

Name	Type	Updated	Action
2.6.1.2 Lab - Securing the Router for Administrative Access	Config Group	2018-06-20 15:11	<input type="button" value="v"/>
S3	Final Lab Config	2018-06-20 15:11	<input type="button" value="v"/>
R2	Final Lab Config	2018-06-20 15:11	<input type="button" value="v"/>
R3	Final Lab Config	2018-06-20 15:11	<input type="button" value="v"/>
S1	Final Lab Config	2018-06-20 15:11	<input type="button" value="v"/>
R1	Final Lab Config	2018-06-20 15:11	<input type="button" value="v"/>
S2	Final Lab Config	2018-06-20 15:11	<input type="button" value="v"/>

- The configuration files saved at the end of the lab reservation for each device in the lab topology are listed (file type is Final Lab Config). You may **View** any file by selecting the option on the Action dropdown.

Name	Type	Updated	Action
 S3	Final Lab Config	2018-06-20 15:11	
 R2	Final Lab Config	2018-06-20 15:11	
 R3	Final Lab Config	2018-06-20 15:11	
 S2	Final Lab Config	2018-06-20 15:11	 View
 S1	Final Lab Config	2018-06-20 15:11	
 R1	Final Lab Config	2018-06-20 15:11	

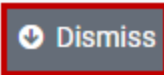


- The configuration file is displayed. When you are finished viewing the file, click **Dismiss**.

```


1  !! NETLAB+ saved configuration: time="2018-06-20 19:11:25 UTC" device="R3"
2  !
3  ! Last configuration change at 13:03:30 UTC Wed Jun 20 2018
4  !
5  version 15.4
6  service timestamps debug datetime msec
7  service timestamps log datetime msec
8  no service password-encryption
9  !
10 hostname Router
11 !
12 boot-start-marker
13 boot-end-marker
14 !
15 !
16 !
17 no aaa new-model
18 memory-size iomem 10
19 !
20 !
21 !
22 !

```



6.2 Configuration File Usage During Lab Reservations

In the subsections below, we will show how to save, load, and erase configuration files during a lab reservation. To illustrate these processes, we have created a lab reservation on a Multi-purpose Academy Pod (MAP). The MAP includes 3 routers and 3 switches.

 Lab Reservations <input style="float: right;" type="text" value="Search"/>			
ID	Date/Time	Description	Pod
1399	 2017-10-26 11:30  2017-10-26 12:30  50 mins. <input type="button" value="Enter Lab"/>	Class CCNA Routing and Switching Fall 2017 User: Test User Class: 2.6.1.2 Lab - Securing the Router for Administrative Access	 CCNA_MAP_4 MULTI-PURPOSE ACADEMY POD 3 Routers, 3 Switches

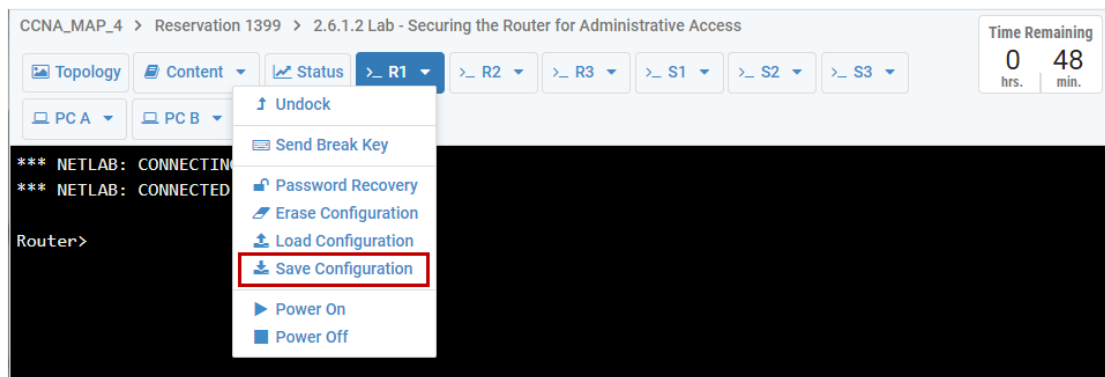


This section assumes some basic knowledge of how to [Schedule Lab Reservations](#) and [Enter a Lab Session](#).

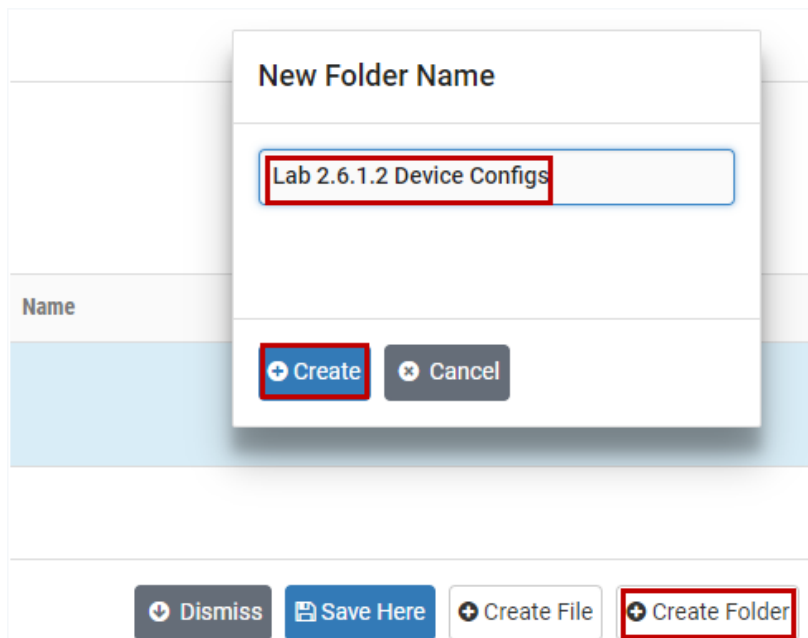
6.2.1 Saving Configuration Files During a Lab Reservation

When saving a configuration, NETLAB+ captures the output from the 'show running' or equivalent commands.

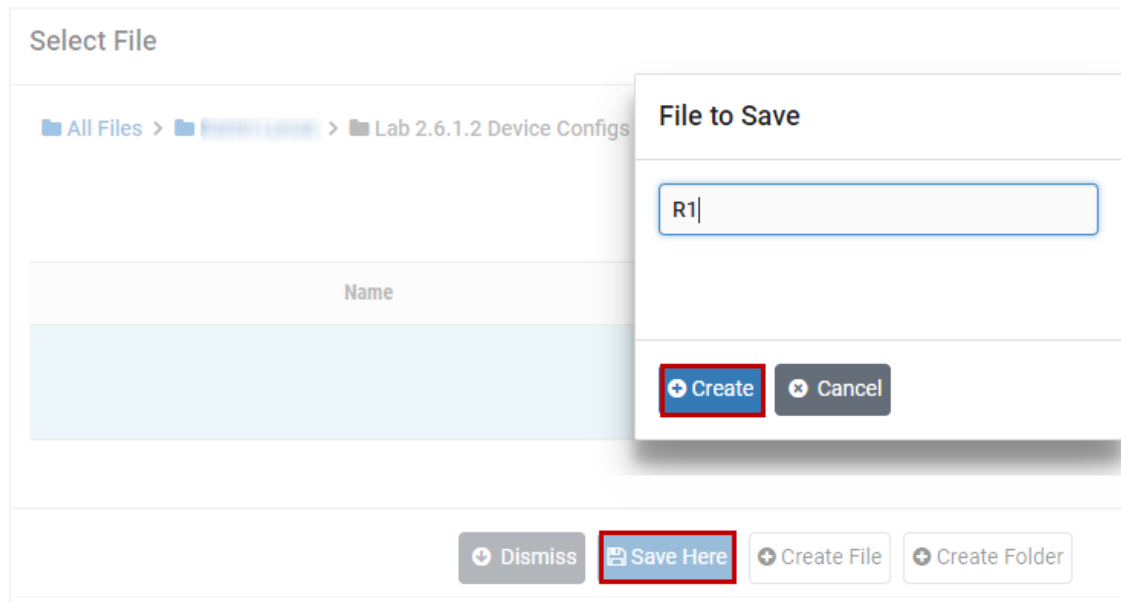
1. To save a configuration file during a lab reservation, select the device (R1 in this example). Click the R1 button again to display the dropdown menu and select the option to **Save Configuration**.



2. You have the option to create a subfolder for your file(s), which can be helpful in keeping your files organized. Here, we'll create a folder for device configuration files for this lab by selecting **Create Folder**, entering a folder name, and then selecting **Create**.



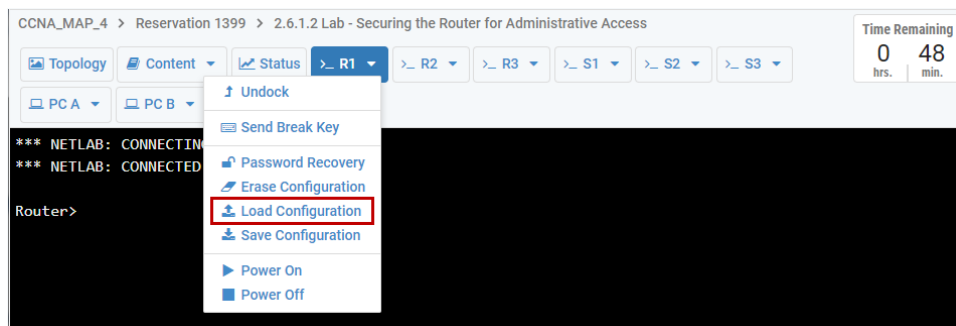
- Click the name of the new folder to select it as the current folder. Select the option to **Save Here**. The popup box will show the default file name as *R1* since we are saving the configuration of the R1 device. Click **Create**. The file will be saved in the *Lab 2.6.1.2 Device Configs* folder.



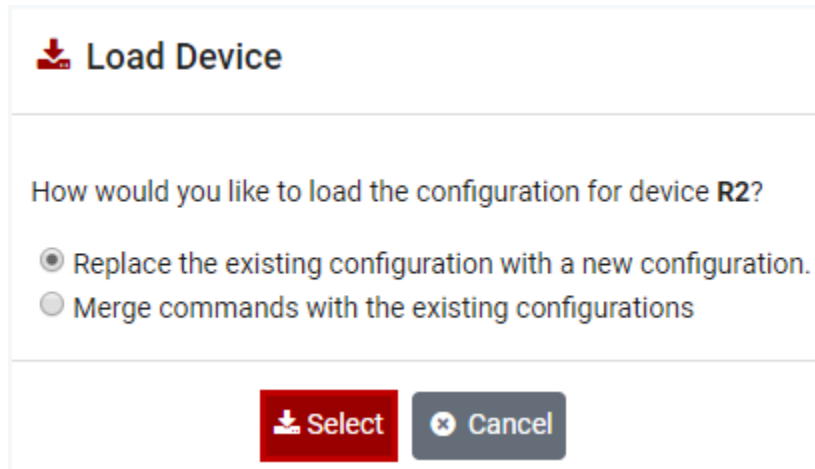
6.2.2 Loading Configuration Files During a Lab Reservation


When loading a configuration into a device, NETLAB+ will enter configuration mode and send each line of the configuration file as if you had typed it manually.

- To load a configuration file during a lab reservation, select the device (R1 in this example). Click the R1 button again to display the dropdown menu and select the option to **Load Configuration**.



- The Load Device popup window will be displayed. You may choose to replace the existing configuration or merge commands with the existing configuration on the device. For this example, we will choose **Replace the existing configuration with a new configuration** and click the **Select** button.





 **Load Device**

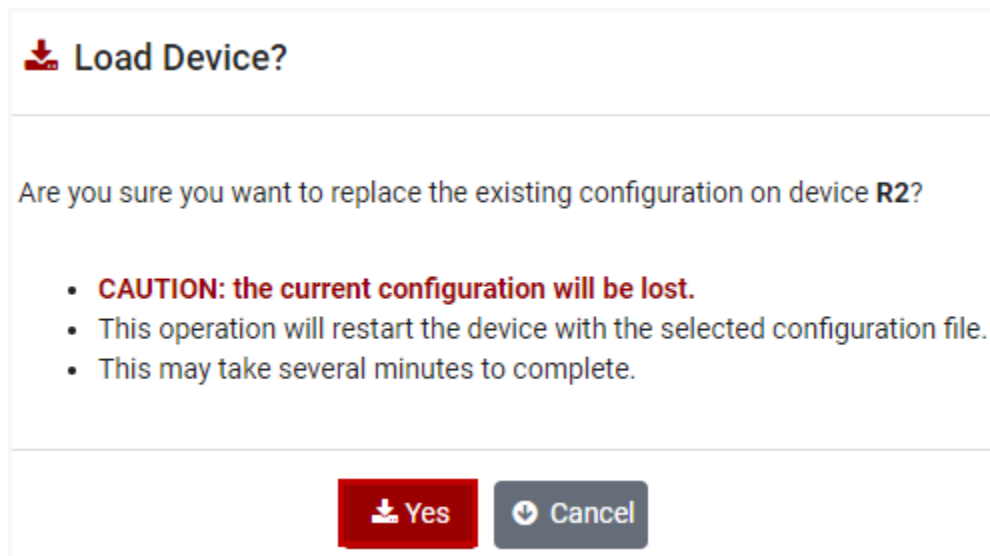
How would you like to load the configuration for device **R2**?


Replace the existing configuration with a new configuration.

Merge commands with the existing configurations

 **Select**  **Cancel**



- Confirm your choice to replace the existing configuration on the device by selecting **Yes**.



 **Load Device?**

Are you sure you want to replace the existing configuration on device **R2**?


- **CAUTION: the current configuration will be lost.**
- This operation will restart the device with the selected configuration file.
- This may take several minutes to complete.

 **Yes**  **Cancel**

- Select the source location of the configuration file. For this example, we will select History, which will allow us to use a configuration file saved from a previous lab session.



Configuration files for all lab devices in a topology are saved automatically by NETLAB+ at the end of each lab reservation. The files are stored in a folder named for the lab exercise. These folders may be accessed by selecting to load configurations from History, as shown below.

 **Source Location**


Where would you like to load the configuration from?


File System

History

↓ Select
✕ Cancel


- Select the account folder by clicking the folder name.

 **All Files**

Name	Type
 NDG	Account Folder

↓ Dismiss

- The Select File page will be displayed. You will see Config Group folders that contain configuration files that were automatically saved by NETLAB+ during previous lab reservations. Select a folder by clicking on the name. In this example, we select the folder from a reservation completed on 2018-06-14, lab exercise 2.6.1.2 (CCNA Security).



The contents of the Select File page will vary. You may see configuration files that were saved for individual devices. The list may also include folders for other classes and accounts.

Name	Type	Updated	Action
2.2.4.5 Lab - Configuring IPv6 Static and Default Routes	Config Group	2018-06-15 11:50	▼
3.2.1.9 Lab - Configuring Basic RIPV2	Config Group	2018-06-14 12:20	▼
2.6.1.2 Lab - Securing the Router for Administrative Access	Config Group	2018-06-14 10:44	▼
S1	Final Lab Config	2018-06-15 11:50	▼
R2	Final Lab Config	2018-06-15 11:50	▼
R3	Final Lab Config	2018-06-15 11:50	▼
S3	Final Lab Config	2018-06-15 11:50	▼
S2	Final Lab Config	2018-06-15 11:50	▼

[Dismiss](#)

- The configuration files saved at the end of the lab reservation for each device in the lab topology are listed (file type is Final Lab Config). You may **View** any file by selecting the option on the Action dropdown.

Name	Type	Updated	Action
R1	Final Lab Config	2018-06-14 10:44	▼
S3	Final Lab Config	2018-06-14 10:44	<div style="border: 2px solid red; padding: 2px; display: inline-block;"> View </div> Select
R3	Final Lab Config	2018-06-14 10:44	▼
S1	Final Lab Config	2018-06-14 10:44	▼
S2	Final Lab Config	2018-06-14 10:44	▼
R2	Final Lab Config	2018-06-14 10:44	▼

- The configuration file is displayed. You may choose to load this file on the device by clicking the **Select** button.

```

1  !! NETLAB+ saved configuration: time="2018-06-14 14:44:51 UTC"
2  !
3  ! Last configuration change at 20:21:35 UTC Mon Jun 12 2017
4  !
5  version 15.4
6  service timestamps debug datetime msec
7  service timestamps log datetime msec
8  no service password-encryption
9  !
10 hostname Router
11 !
12 boot-start-marker
13 boot-end-marker
14 !
15 !
16 !
17 no aaa new-model
18 memory-size iomem 15
19 !

```

- You will see the configuration loading. Keyboard input will be disabled while the automation is in progress.

```



CISCO2901/K9 platform with 524288 Kbytes of main memory
Main memory is configured to 72/-1(On-board/DIMM0) bit mode with ECC enabled

Readonly ROMMON initialized
<BREAK><BREAK><BREAK>rommon 1 >
rommon 1 >
rommon 1 > # NETLAB SYNC 1 #
rommon 2 > # NETLAB SYNC 2 #
rommon 3 > # NETLAB SYNC 3 #
rommon 4 > dir flash:
program load complete, entry point: 0x80803000, size: 0x1b340
Directory of flash:

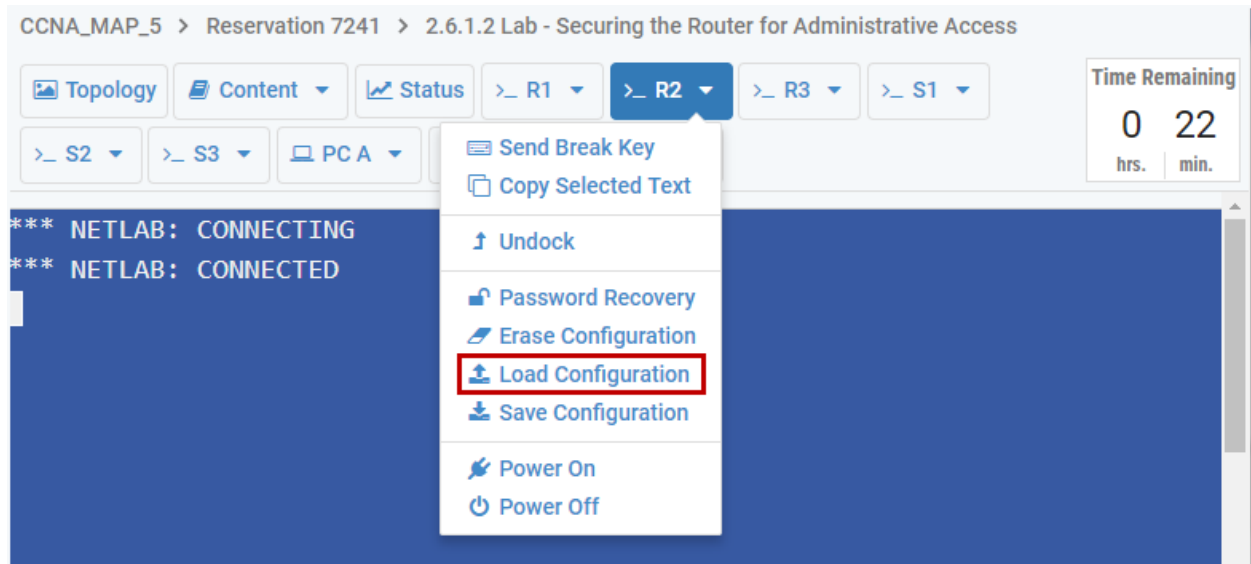
7      104134844 -rw-    c2900-universalk9-mz.SPA.154-3.M2.bin
25434  0          drw-    n
2      1793      -rw-    exit
4      1609      -rw-    R1-running-config-backup
5      0         drw-    ipsdir
3      1805      -rw-    running-config
rommon 5 > confreg 0x2142

```


⌨️ KEYBOARD INPUT DISABLED (AUTOMATION IN PROGRESS)

R1 80 X 24 TX RX  

- Next, we will load a configuration file into device R2. To load a configuration file during a lab reservation, select the device (R2 in this example). Click the R2 button again to display the dropdown menu and select the option to **Load Configuration**.



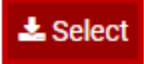

- To load a configuration file without erasing the current configuration on a device, select the option to **Merge commands with the existing configurations**.

 **Load Device**

How would you like to load the configuration for device **R2**?

Replace the existing configuration with a new configuration.

Merge commands with the existing configurations

12. Confirm your intention to modify the existing configuration by clicking the **Yes** button.

Load Device?

Are you sure you want to modify the existing configuration on device **R2**?

- **CAUTION: This may alter the current configuration.**
- This operation will merge the current configuration with the selected configuration file.


13. For this example, we will use a file that was saved during a previous lab reservation. Select the option to load a configuration from the **File System**.

Source Location

Where would you like to load the configuration from?

File System
 History

- The Select File page will be displayed. The list of files/folders includes class and account folders. Select a folder by clicking on the folder name.



The contents of the Select File page will vary. You may see configuration files that were saved for individual devices. The list may also include folders for other classes and accounts.

Select File

📁 All Files
All Files ▾
Search

Name	Type
📁 NDG	Account Folder
📁 CCNA Summer Routing and Switching 2018	Class Folder
📁 Ethical Hacking	Class Folder

⏴ Dismiss

- The class folder in this example contains a file that was previously saved by the class instructor. To view the file, click the file name.

Select File

📁 All Files > 📁 CCNA Summer Routing and Switching 2018 System Files
Search

Name	Type	Updated	Action
📄 Lab 2.6.1.2 Config for R2	File	2018-06-18 15:35	▾

⏴ Dismiss
+ Create File
+ Create Folder

16. The configuration file will be displayed. Click **Select** to load the file.



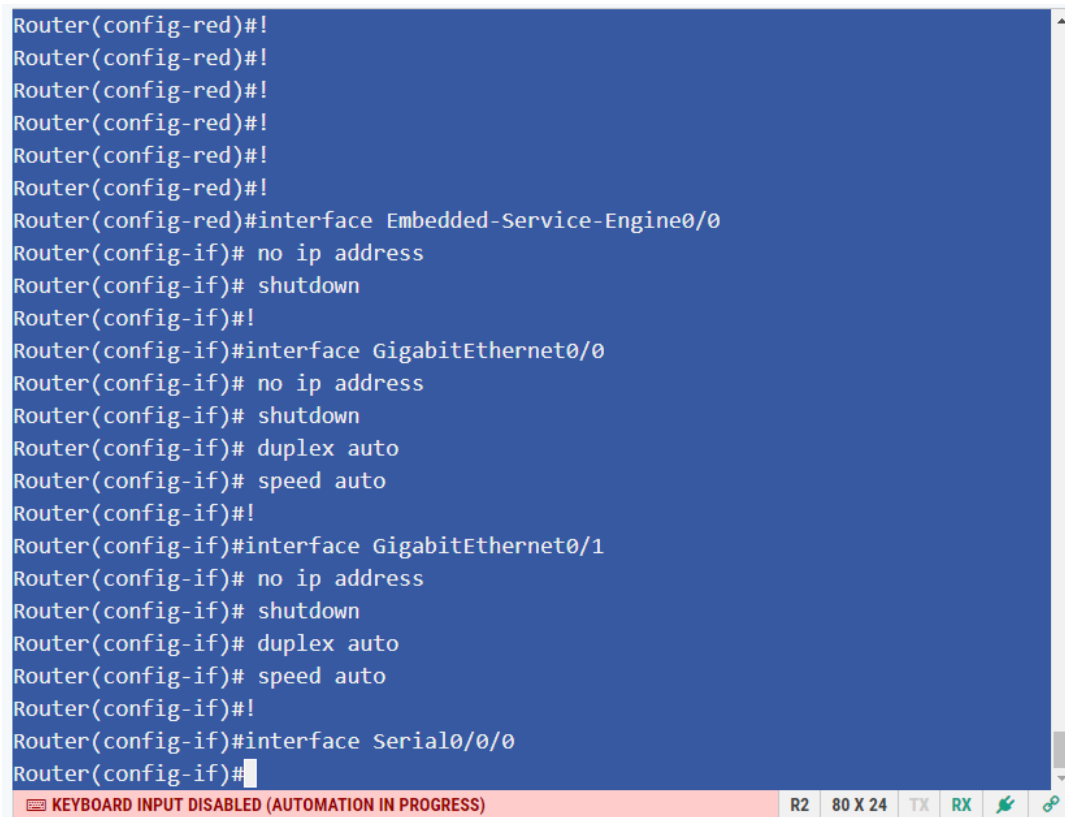
```

1  !! NETLAB+ saved configuration: time="2018-06-18 19:35:24 UTC" device="R2" hardw
2  !
3  ! Last configuration change at 14:29:55 UTC Mon Jun 18 2018
4  !
5  version 15.4
6  service timestamps debug datetime msec
7  service timestamps log datetime msec
8  no service password-encryption
9  !
10 hostname Router
11 !
12 boot-start-marker
13 boot-end-marker
14 !
15 !
16 !
17 no aaa new-model
18 memory-size iomem 15
19 !
20 !
21 !
22 !
23 !
24 !
25 !
26 !
27 !
28 !
29 !
30 !
31 !
32 !
33 ip cef
34 no ipv6 cef

```

Dismiss Select Edit

17. You will see the configuration loading. Keyboard input will be disabled while the automation is in progress.



```

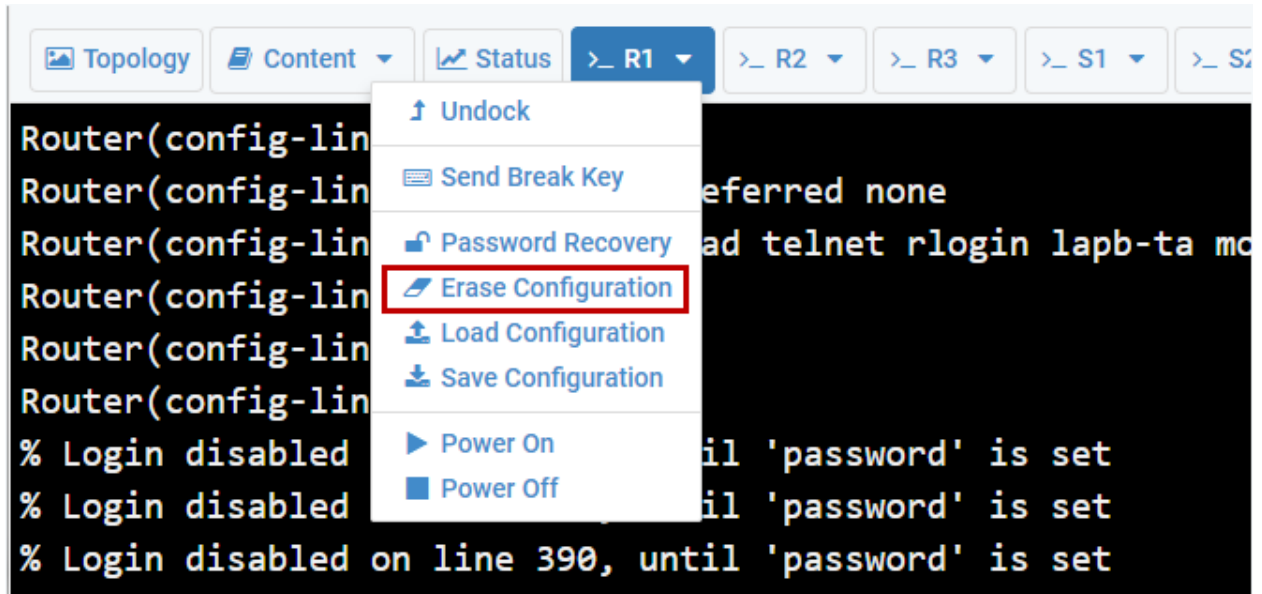
Router(config-red)#!
Router(config-red)#!
Router(config-red)#!
Router(config-red)#!
Router(config-red)#!
Router(config-red)#!
Router(config-red)#interface Embedded-Service-Engine0/0
Router(config-if)# no ip address
Router(config-if)# shutdown
Router(config-if)#!
Router(config-if)#interface GigabitEthernet0/0
Router(config-if)# no ip address
Router(config-if)# shutdown
Router(config-if)# duplex auto
Router(config-if)# speed auto
Router(config-if)#!
Router(config-if)#interface GigabitEthernet0/1
Router(config-if)# no ip address
Router(config-if)# shutdown
Router(config-if)# duplex auto
Router(config-if)# speed auto
Router(config-if)#!
Router(config-if)#interface Serial0/0/0
Router(config-if)#

```

KEYBOARD INPUT DISABLED (AUTOMATION IN PROGRESS) R2 80 X 24 TX RX

6.2.3 Erasing the Configuration on a Device During a Lab Reservation

1. To erase the configuration on a device during a lab reservation, select the device (R1 in this example). Click the R1 button again to display the dropdown menu and select the option to **Erase Configuration**.



2. A warning message will be displayed. Select **Yes** to confirm that you want to erase the configuration.

