



Student Guide

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NETLAB+ Version: **4.0.25+**

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1 Introduction

NETLAB+[®] is the premiere remote lab appliance for information technology training and distance learning, developed by Network Development Group, Inc. Students and instructors can share worldwide access to real lab equipment in a training environment that is easy to use and manage.

Depending on how your instructor has opted to use the NETLAB+ system, you may be able to log in, create and edit configuration files, and program one or more lab devices. Because NETLAB+ equipment can be accessed from any PC and browser connected to the Internet, you can perform configuration tasks from virtually anywhere. The NETLAB+ scheduler provides controlled access to the lab equipment. All lab access is by reservation, using the scheduler.

Your instructor may also choose to use the NETLAB+ system within the classroom. The Instructor-led lab features of NETLAB+ provide an effective way to teach new configuration tasks, as instructors lead their class through a lab exercise. Instructors can issue configuration commands to one or more devices while each student observes the process within a Telnet session initiated through NETLAB+.

Using NETLAB+, you may be given assignments to complete individually, or as part of an assigned team. Students grouped into teams can work together from different locations.

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2 Initial Login

Students access the NETLAB+ system via the web interface. Your instructor will provide you with the URL or IP address of the NETLAB+ server that you may access using your web browser. To access the login page, direct a browser to the IP address of the NETLAB+ server. Please review the information on the login page concerning browser support and firewall use.

You will also receive a username and initial password. Enter your username and password in the login box located on the left side of the page.

[NETLAB Academy Edition](#)[®] provides remote access to Cisco Networking Academy Program lab equipment and curriculum. To access, you need a user ID and password, assigned by your instructor or local system administrator.

Personal Firewall software can interfere with NETLAB. If you are having login problems or other issues, please disable your personal firewall to see if that fixes the problem. If so, adjust your firewall software accordingly.

Required Browser Plugins and Options

Java™	Enabled (IE users see below)
JavaScript	Enabled
Cookies	Enabled (for this site)
Popup Windows	Enabled (disable popup blockers for this site)

Browser Support

Browser	Version	Status
Microsoft Internet Explorer (Windows)	5.5, 6.x	<input checked="" type="radio"/> Supported
Firefox	1.x	<input checked="" type="radio"/> Supported
Mozilla	1.x	<input type="radio"/> Beta (not tested)
	7.x	<input type="radio"/> Beta (not tested)
Netscape	6.x	<input checked="" type="radio"/> Not supported (bugs)
	4.x	<input checked="" type="radio"/> Obsolete

Microsoft Internet Explorer users may need a Java plug-in. You can obtain Java at java.sun.com.

2.1 New Password

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

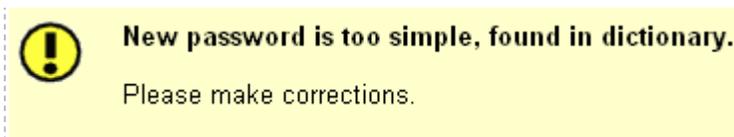
Passwords must meet the following requirements:

- **Not found in the English dictionary and not too simple**
- **Between 7 and 16 ASCII characters**
- **Contain both numbers and letters**

One strategy you may find helpful 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.

A screenshot of a web form for changing a password. It features two input fields: the first is labeled "New Password" and the second is labeled "Re-type New Password". Both fields contain masked characters (asterisks). Below the fields is a button with a green checkmark icon and the text "OK".

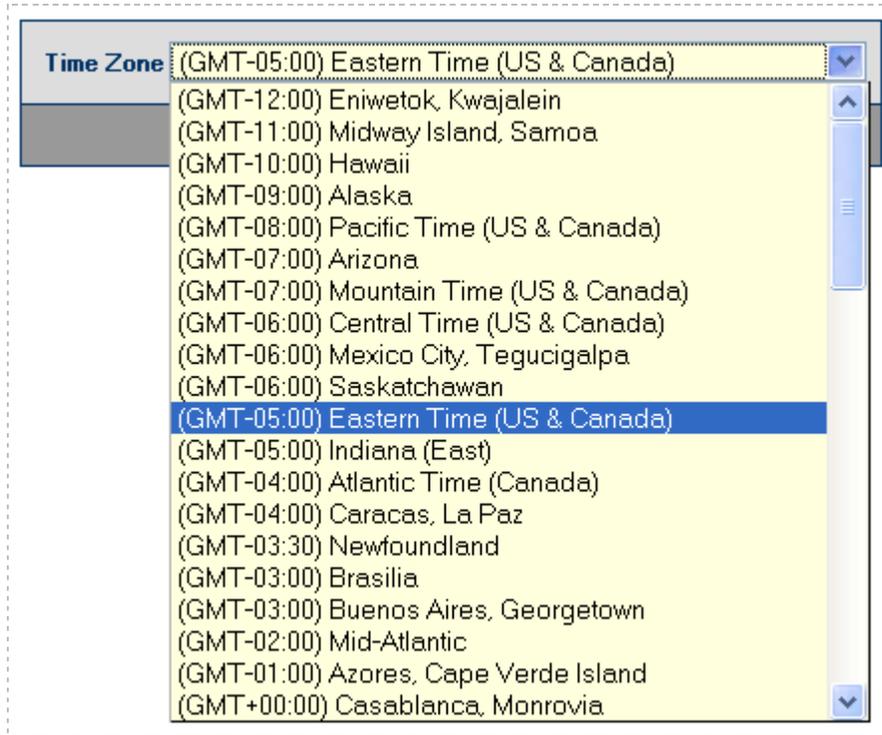
An error message is displayed if the password entered does not meet requirements. The message will indicate why the password was unacceptable. This example shows an error message displayed when the new password entered is a simple word found in the dictionary and therefore not eligible to be a password on the system.



The MyNETLAB Instructor Interface, described in the next section, will be displayed after you have successfully changed your password.

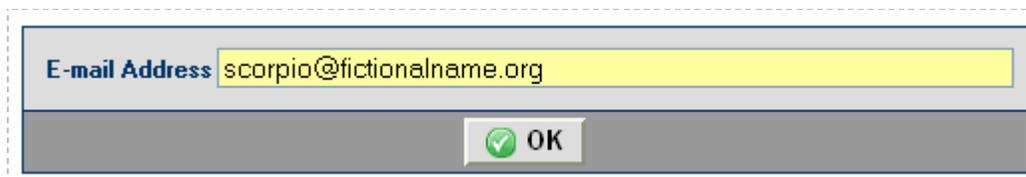
2.2 Time Zone

You will select the **Time Zone** appropriate to your region. Selecting the correct time zone is important, to allow correct time information to be displayed when using the scheduler (see section 5).



2.3 Email Address

The next field you will be prompted to enter is your **Email Address**. This field may already contain a value, if an email address was entered at the time your account was created. If so, edit the email address if necessary.



2.4 Remote Access Test

A Remote Access Test is performed during each user login. The purpose of the test is to attempt to establish an outbound TCP connection. This connection is necessary for remote device access, remote PC access and access to chat functions (chat functions will be available in a future software release).

This test will fail if a connection using the TCP port(s) defined by the NETLAB+ administrator cannot be established.

Remote Access TestSTUDENT
 bsmith

PORT TEST FAILED

A TCP/IP connection for remote console and remote PC functions could not be established.

Personal Firewall Software **Firewall** **Internet** **Firewall** **NETLAB+ Server**

Please refer to the diagram above.

This system uses **TCP port 23** for remote access functions. It is possible that personal firewall software on your computer, or some other firewall in the path is blocking connections on this TCP port.

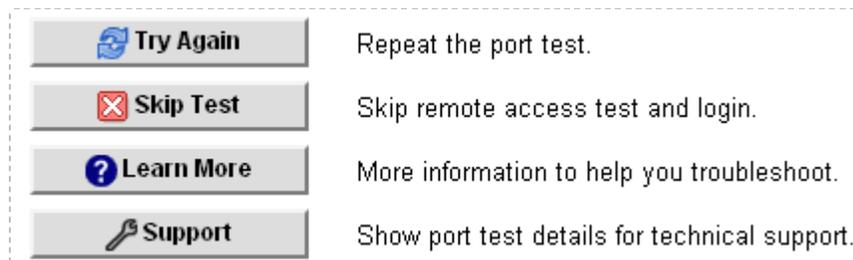
- Are you using Windows Firewall, McAfee®, Norton, Comodo, Zone Alarm®, AVG, or other security software?
- If your software is prompting you to validate the connection, please accept and try again.
- Manual configuration changes to your software may be required.
- For technical details about this port test, please click the Support button.

In this example, the Remote Access Test failed when student “bsmith” logged in.

NETLAB+ now allows the administrator to define the Remote Access Port (or list of ports) that may be used in place of the factory default, port 23.

There are several reasons why the Remote Access Test may fail:

- 1) Personal Firewall settings on your computer:** The personal firewall software on your computer may be set by default to prohibit the port connection. This issue is routinely resolved by selecting to allow the connection when prompted by a pop-up window from your personal firewall software.
- 2) Security policy at your current location:** It is possible that local security policy does not allow outbound access using the port(s) chosen by the NETLAB+ administrator. This is the most likely diagnosis if you are able to successfully access the system from another location.
- 3) Ports have not been opened in the site firewall:** As part of the installation process, you must be certain to open the ports in the site firewall that have been designated available for outbound client connections. This is only likely to be the problem if all users are unable to establish a connection.



Use the “**Try Again**” option if you wish to repeat the test after adjusting your personal firewall settings. You may select “**Skip Test**” if you prefer to proceed to your MyNETLAB page without resolving the issue at this time. You will not have remote device access, remote PC access or chat functions (chat functions will be available in a future software release).

3 MyNETLAB Student Interface

After successful login, the MyNETLAB student interface page will be displayed.

MyNETLAB STUDENT

File Scheduler Profile Curriculum Logout Help msmith

Welcome to the NETLAB system of XYZ Tech!

You have 1 [message](#).

ID	DATE / TIME	DESCRIPTION	POD
935	TODAY 11:00AM - 12:00PM	Mary Smith (msmith) Class: CCNP Fall Class	POD 1 BASIC ROUTER POD v2 3 Routers PC Support
936	TODAY 1:00PM - 2:30PM	Class: CCNP Fall Class Instructors: Jane Doe	POD 1 BASIC ROUTER POD v2 3 Routers PC Support

[Refresh](#) this page to check for recently scheduled labs.

Scheduler

Reserve lab time or check the schedule.

File Manager

Manage device configuration files.

Profile

Change your personal settings.

Curriculum

Access class learning materials.

[Logout](#) [Help](#)

In the upper right corner, the privilege level “student” and your Username are displayed.

The menu bar at the top of the screen contains choices including **File**, **Scheduler**, **Profile**, **Curriculum**, **Logout** and **Help**. These functions are accessed by selecting them on the menu bar or the corresponding icon on the page.

Use the **File** link to enter the section where you may manage your own configuration files and access shared files created for your class by your instructor.

You may use the **Scheduler** to schedule lab time, if your instructor has chosen to enable this access to your class. The scheduling feature facilitates scheduled access to lab equipment.

Use the **Profile** link to update your user preferences. You may update your email address, password and Telnet client selection.

Subject to availability, you can reference course content information in the **Curriculum** section. This can include learning materials that supplement your labs.

The **Logout** link is used to logout of the NETLAB+ system.

Select the **Help** section to access links to documentation and FAQs.

The section below the menu bar may contain information provided by the NETLAB+ administrator pertaining to your use or scheduling of the NETLAB+ resources. Review the section each time you log in.

Any scheduled lab times for you and your classes will be listed on the page. You may see instructor-led reservations, team reservations, and individual reservations.

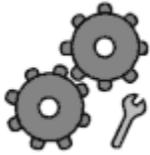
You may see a message indicator on the page. Selecting **Message** will display informational or error messages pertaining to lab reservations or the status of lab devices.

You have 1 [message](#).

The messages will be retained by exiting using the **Close** button. You may delete some or all of the messages by using the **Delete Selected** or **Delete All** buttons.

Select	ID	Time	Description
The following lab reservation was deleted by jdoe2006 (Jane Doe), who had administrative rights to perform this action.			
<input checked="" type="checkbox"/>	16	Mon Feb 13, 2006 4:30AM	<ul style="list-style-type: none"> ◆ Reservation: 898 ◆ Pod: POD 1 ◆ Starting: Thu Feb 9, 2006 12:00PM Eastern Time (US & Canada) ◆ Type: Team reservation ◆ Reserved for: Team A

4 Set Your Student Profile



To set the appropriate values in your student profile, access the profile page by selecting Profile on the MyNETLAB menu bar or the link in the body of the page. Some information may have been set by your instructor when creating your student account.

You should update your profile information as needed.



Your current profile settings will be displayed.

ACCOUNT SETTINGS (msmith)	
Full Name	Mary Smith
Community	XYZ Technical College
Privileges	Student
▶ Password	(not displayed)
▶ Time Zone	(GMT-05:00) Eastern Time (US & Canada)
▶ E-mail Address	msmith@fictionalname.org
▶ Telnet Client	NETLAB Telnet Applet

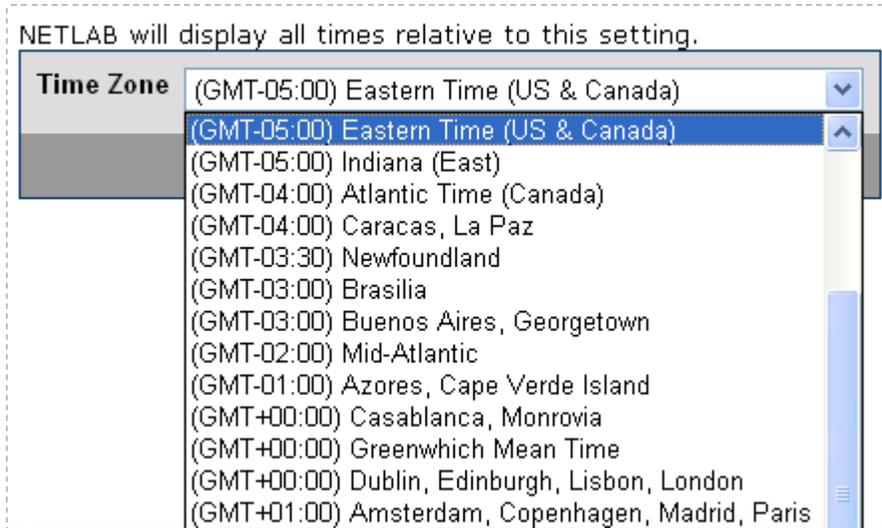
The first field, **Password** allows you to change your password. Select the password field to display the change password screen.

Passwords must meet the following requirements:

- **Not found in the English dictionary and not too simple**
- **Between 7 and 16 ASCII characters**
- **Contain both numbers and letters**

An error message will be displayed if the entered password does not meet these requirements. See section 2 for details.

The **Time Zone** field allows you to select the time zone appropriate to your region. Selecting the correct time zone is important, to allow correct time information to be displayed when using the scheduler (see section 5).



Enter your email address in the email address field.

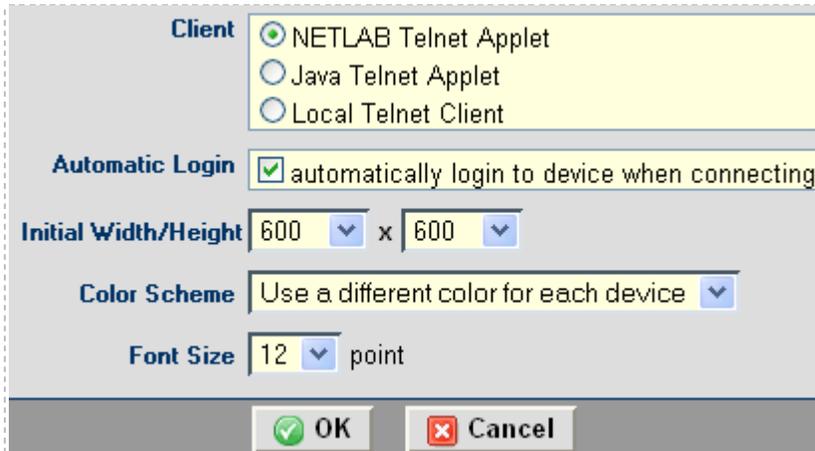


Your **Telnet Client** preference may be changed if needed. You may use the optional Java-based Telnet Applets supplied with NETLAB+, or you may use your own Telnet client application installed on your local machine.

- **NETLAB+ Telnet Applet** provides a Telnet applet streamlined for NETLAB+. It operates in line mode that is suitable for devices with a command line interface. It loads quickly, provides automatic login, can be resized in Microsoft Internet Explorer, and can provide a different color scheme for each device.
- **Java Telnet Applet** provides a consistent interface, automatic login, and full VT100 terminal emulation. It is 165 kilobytes, so it may load slowly the first time over a slow network connection.
- **Local Telnet Client** option will prompt for your NETLAB+ user ID and password each time you connect to a device. Your browser (or client computer) must be configured to associate URL's in the form of telnet:// with your local Telnet client application.

Windows XP Users Please Note: Both the Java™ Telnet Applet and NETLAB+ Telnet Applet require Java™. You can get the Java plug-in for Windows XP from java.sun.com

For both the Java and NETLAB+ applets, options for automatic login, initial width and height of the window, color scheme and font size may be selected.



The image shows a configuration dialog box with a light gray background and a dashed border. It contains several settings:

- Client:** A radio button group with three options: "NETLAB Telnet Applet" (selected), "Java Telnet Applet", and "Local Telnet Client".
- Automatic Login:** A checked checkbox followed by the text "automatically login to device when connecting".
- Initial Width/Height:** Two input fields, both containing "600", separated by an "x" symbol. Each field has a small downward arrow on its right side.
- Color Scheme:** A dropdown menu with the text "Use a different color for each device" and a downward arrow.
- Font Size:** An input field containing "12" followed by the word "point" and a small downward arrow.

At the bottom of the dialog, there are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon.

5 Schedule Lab Reservations



NETLAB+ includes a scheduling feature to facilitate scheduled access to lab equipment. If your instructor has configured NETLAB+ to allow students to schedule their own lab time, you will see a link for the **Scheduler** section on the MyNETLAB screen. Selecting this link will open the scheduling utility to reserve the equipment for a particular lab exercise or a block of time.

To schedule a lab reservation, select **Scheduler** from the menu bar or the link on the body of the MyNETLAB page.



The list of classes that you are enrolled in where student lab scheduling is enabled will be displayed. Unlike earlier versions of NETLAB+, you may now use a single NETLAB+ account to access the system regardless of how many classes you are enrolled.

YOUR CLASSES				
CLASS NAME	LEAD INSTRUCTOR(S)	# ENROLLED	START DATE	END DATE
CCNP Fall Class	Jane Doe	6	Jan 21, 2006	May 15, 2006
FNS review class	Jane Doe	3	None	None

Select a class by clicking on the class name link. The scheduling options available to you will depend on what options your instructor has enabled for the class. You may have the choice of individual or team reservations. Your team assignment (if available) is made by your instructor. See section 7 for a description of the different types of lab sessions available to students.

Scheduling Options

Your class allows both individual and team reservations.

You are a member of **team A**.

Team members are Ann Dole, John Smith, Mary Smith.

Reserve lab time for **yourself**

Reserve lab time for your **team**

If curriculum content has been installed on your NETLAB+ system, the course catalog will be displayed allowing you to select a specific exercise. Otherwise, you may proceed directly to the reservation calendar as shown below.

This example shows lab exercises available on a NETLAB_{AE} system. An exercise may be selected by clicking on the exercise name. Notice that the first option allows the selection of “no exercise”.

PARTIAL LIST OF LAB EXERCISES (BASED ON AVAILABLE LAB EQUIPMENT)				
TYPE	EXERCISE NAME	TIME LIMIT	DESCRIPTION	POD TYPE
CCNA Pod	▶ Reserve Basic Router Pod Version 2 (no exercise)	up to 4 hours	▶ show topology	BASIC ROUTER POD v2 3 Routers PC Support
CCNA Pod	▶ Reserve Basic Switch Pod Version 2 (no exercise)	up to 4 hours	▶ show topology	BASIC SWITCH POD v2 1 Router, 2 Switches PC Support
CCNA2 Lab	▶ 2.2.1: Router Configuration Using Setup	50 min	▶ view description	BASIC ROUTER POD v2 3 Routers PC Support
CCNA2 Lab	▶ 2.2.9: Command Line Fundamentals	50 min	▶ view description	BASIC ROUTER POD v2 3 Routers PC Support
CCNA2 Lab	▶ 3.1.2: Command Modes and Router Identification	50 min	▶ view description	BASIC ROUTER POD v2 3 Routers PC Support
CCNA2 Lab	▶ 3.1.3: Configuring Router Passwords	50 min	▶ view description	BASIC ROUTER POD v2 3 Routers PC Support

Once an exercise has been selected, the reservation calendar will be displayed, where a reservation time may be selected. Use the calendar in the upper left corner of the screen 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 > symbols.

The number of pods available for you to select from will depend upon the number and type of pods that have been installed on your NETLAB+ server that are appropriate for the class curriculum and lab exercise.. Consult your instructor if you have questions about the pods available to you.

Scheduler
STUDENT

MyNETLAB Logout
 msmith

<< February 2006 >>						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
			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				

Now Showing

Saturday
February
18
2006

Today's Date and Local Time

February 17, 2006

11:35 AM

Eastern Time (US & Canada)

Select a pod and reservation time for **Reserve Basic Router Pod Version 2 (no exercise)** by clicking on a

		POD 1 BASIC ROUTER POD v2 3 Routers PC Support	
12am		937 CCNP Fall Class	^
1am			≡
2am		938 CCNP Fall Class, Team B	v
3am			
4am			
5am			

To select a reservation time, scroll the page up and down as needed to display available reservation times. Available times are indicated with an symbol. Scrolling to the bottom of the page will display the color legend, designed to make the calendar easy to understand.

Color Legend	
	Date you are viewing
	Today's date
	Time reserved for you
	Time reserved for someone else
	Unreserved time
	* Access restricted to specific instructors and classes
	Available time, click to reserve

Once a lab reservation time has been selected by selecting an available time , the confirmation page will be displayed.. Select the appropriate option for initial configuration of the pod equipment. The restore last configuration option will try to restore the lab to the state it was in at the end of the last attended reservation. Select **Confirm** to confirm the reservation or **Back to Calendar** to make changes.

Here, we show the confirmation screen for a student self study session for student “msmith”. The instructor has configured this class to allow students to schedule individual reservations. If the class were configured for team reservations, the **Reserved For** area would display the assigned team.

Select **Confirm** to confirm the reservation or **Back to Calendar** to make changes.

Reservation Type Individual Self Study for Class

Class Name CCNP Fall Class

Exercise 2.2.9 Command Line Fundamentals

Equipment Pod POD 1

Reserve Pod For Mary Smith

Time Zone Eastern Time (US & Canada)

Start Time Saturday February 18, 2006 4:00AM

End Time Saturday February 18, 2006 5:00AM

Initial Configuration

restore configs from last Basic Router Pod (Version 2) reservation (if any)

no configs loaded (clean)

After confirming, a message will be displayed and you may make additional reservations, or select **I'm Done** to return to the MyNETLAB page.

Reservation 939	
Reservation Type	Individual Self Study for Class
Class Name	CCNP Fall Class
Exercise Name	2.2.9 Command Line Fundamentals
Equipment Pod	POD 1
Reserved For	Mary Smith (msmith)
Time Zone	(GMT-05:00) Eastern Time (US & Canada)
Start Time	Sat Feb 18, 2006 4:00AM
End Time	Sat Feb 18, 2006 5:00AM
Initial Configuration	load last saved config (if any)




Once a reservation has been confirmed, it will be displayed on the MyNETLAB page. Here, we see that reservation 939 has been added to the list of lab reservations.

This example also shows a lab reservation occurring at the current time. Lab reservation 935 indicates **Now** rather than **Future** and the **Enter Lab** button is displayed. Entering a lab session will be discussed in section 7.1. At this time, the reservation information will also appear on your instructor's MyNETLAB page, giving your instructor the option to participate in the session and monitor your progress or provide assistance.

LAB RESERVATIONS			
ID	DATE / TIME	DESCRIPTION	POD
935	Now 11:00AM - 12:00PM	 Mary Smith (msmith) Class: CCNP Fall Class	POD 1 BASIC ROUTER POD v2  3 Routers PC Support
937	Sat Feb 18, 2006 12:00AM - 1:30AM	    Class: CCNP Fall Class Instructors: Jane Doe	POD 1 BASIC ROUTER POD v2  3 Routers PC Support
939	Sat Feb 18, 2006 4:00AM - 5:00AM	 Mary Smith (msmith) Class: CCNP Fall Class	POD 1 BASIC ROUTER POD v2  3 Routers PC Support

6 Delete Reservations

If you know you will be unable to make use of a lab reservation you have scheduled, delete the reservation to allow the lab resources to be available for others to reserve. On the Lab Reservations section of the MyNETLAB page, click on the lab reservation number to display the reservation details.

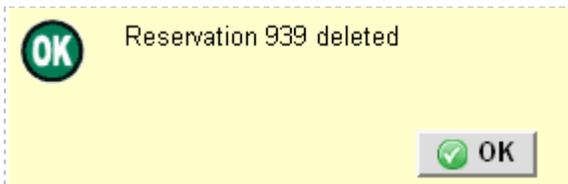
Please Note: You may only delete reservations that you have scheduled

939	Sat Feb 18, 2006 4:00AM - 5:00AM	 Mary Smith (msmith) Class: CCNP Fall Class	POD 1 BASIC ROUTER POD v2  3 Routers PC Support
---------------------	-------------------------------------	---	--

Selecting **OK** will return you to the MyNETLAB page with no deletion. Select **Cancel Reservation** to delete the reservation

Reservation 939	
Reservation Type	Individual Self Study for Class
Class Name	CCNP Fall Class
Exercise Name	2.2.9 Command Line Fundamentals
Equipment Pod	POD 1
Reserved For	Mary Smith (msmith)
Time Zone	(GMT-05:00) Eastern Time (US & Canada)
Start Time	Sat Feb 18, 2006 4:00AM
End Time	Sat Feb 18, 2006 5:00AM
Initial Configuration	load last saved config (if any)

A message will display indicating the reservation deletion has been performed..



7 Lab Sessions

Section 5 described how lab reservations are made using the scheduling system. The labs will be listed in the Lab Reservations section of the MyNETLAB page. The labs displayed will include lab sessions for your own use (individual or team) and instructor-led lab sessions.

 **Instructor-led training time for a class.** These sessions are scheduled by your instructor for lecturing or guiding a whole class of students.

 **Self-study time for student teams.** Team assignments are made by your instructor. Your instructor may make lab reservations for your team, or may choose to allow you to schedule your own team reservations.

 **Self-study time for individual students.** Your instructor may make lab reservations for you, or may choose to allow you to schedule your own reservations.

The reservation ID, status, Date and time of the reservation, instructor and/or student/team designation, pod name, and type are displayed.

Notice that this example lab access page for user “msmith” displays several reservations including a current individual lab reservation, a team reservation and a reservation for an instructor-led reservation.

LAB RESERVATIONS			
ID	DATE / TIME	DESCRIPTION	POD
946	HOW 9:30AM - 10:30AM <input type="button" value="ENTER LAB"/>	 Mary Smith (msmith) Class: CCNP Fall Class	POD 1 BASIC ROUTER POD v2  3 Routers PC Support
943	TODAY 11:00AM - 12:00PM	 Class: CCNP Fall Class Instructors: Jane Doe	POD 1 BASIC ROUTER POD v2  3 Routers PC Support
944	TODAY 1:00PM - 2:00PM	 Team A: Ann Dole, John Smith, Mary Smith Class: CCNP Fall Class	POD 1 BASIC ROUTER POD v2  3 Routers PC Support

7.1 Enter a Lab Session

Here, we show a lab reservation that has been scheduled for an individual student's use. At the scheduled time, the lab session indicates **Now** rather than **Future** and the **Enter Lab** button will display. The student can enter the Lab Access Interface by selecting the **Enter Lab** button

LAB RESERVATIONS			
ID	DATE / TIME	DESCRIPTION	POD
946	Now 9:30AM - 10:30AM ENTER LAB	Mary Smith (msmith) Class: CCNP Fall Class	POD 1 BASIC ROUTER POD v2  3 Routers PC Support

The **Lab Access** Page is divided into several tabbed sections, allowing users to easily access all of NETLAB+'s functions. The **Topology**, **Action**, **Status**, **Connections**, **Load** and **Save** sections can be accessed by selecting the section name on the tab. Details on each of these sections is provided in section 8.

You may see the **Initializing** indicator displayed on the page at the very beginning of your session. This indicates that NETLAB+ is in the process of initializing the lab devices in the topology to prepare them for use. When initialization is complete, the **We're Done** button (for team), or **I'm Done** button (for individual) will appear allowing you to end the session prior to the scheduled end time (see section 7.3). Only instructors may choose to end an instructor-led session.

Lab Access
STUDENT

MyNETLAB [Logout](#)
 msmith

INITIALIZING
ALERTS
POD 1 45 minutes remaining

Topology
Action
Status
Connections
Load
Save

Click on the content button below to view the lab instructions.

You are using a NETLAB Basic Router Pod for this exercise. Only one router is required to complete the lab. All three routers may be used for team or class activities.

You will access the router console remotely using NETLAB. To open a console connection, click on one of the routers on the left. This will provide the equivalent access of a local PC and HyperTerminal.

Please note, NETLAB will allow more than one user to connect to each router or PC. This is a feature of NETLAB, not the router device.

2.2.9 Command Line Fundamentals
[Show Lab Content](#)

Throughout your lab session, you may see the **Alerts** indicator appear (as shown in previous picture of the lab access interface). Selecting Alerts will display informational or error messages pertaining to the status of the lab devices in the pod. The alerts can be deleted or saved.

Select	ID	Time	Description
			The following lab reservation was deleted by jdoe2006 (Jane Doe), who had administrative rights to perform this action.
<input checked="" type="checkbox"/>	16	Mon Feb 13, 2006 4:30AM	<ul style="list-style-type: none"> ◆ Reservation: 898 ◆ Pod: POD 1 ◆ Starting: Thu Feb 9, 2006 12:00PM Eastern Time (US & Canada) ◆ Type: Team reservation ◆ Reserved for: Team A

Close
Delete Selected
Delete All

NETLAB+ devices may be accessed by opening a Telnet session through the **Topology**, **Action**, **Status** or **Connections** tabs on the Lab Access interface. See section 8 for a detailed description of each section.

7.2 Accessing Devices

NETLAB+ supports two methods for remotely accessing lab devices:

- Remote Console for routers, switches, firewalls
- Remote K/V/M (keyboard/video/mouse) for remote PCs

NETLAB+ devices may be accessed from the Topology, Status or Connections tabs on the Lab Access interface (see section 8 for a detailed description of each tab). To access a device, select the Topology tab and click on the device in the drawing. Alternatively, you may use the hyperlinks on Connection tab or Status tab.

By default, NETLAB+ will open the built-in console viewer or remote PC viewer. These viewers are Java based, so there is no special client to load (other than Java). You may also use your own Telnet software for Remote Console connections (see section 4).

NETLAB+ support sharing of both console based devices and remote PCs. During an instructor-led session or a team reservation, multiple users may enter the lab and simultaneously connect to the same device. This is ideal for both Blended Distance Learning and team-based collaboration.

Please Note: Each Remote K/V/M connection consumes additional CPU processing power on the remote PC. A practical limit of 3 shared sessions to the same remote PC should be observed to maintain reasonable response times. Remote Console based connections (routers, switches, and firewalls) do not consume significant CPU resources and can support as many as 30 sessions.

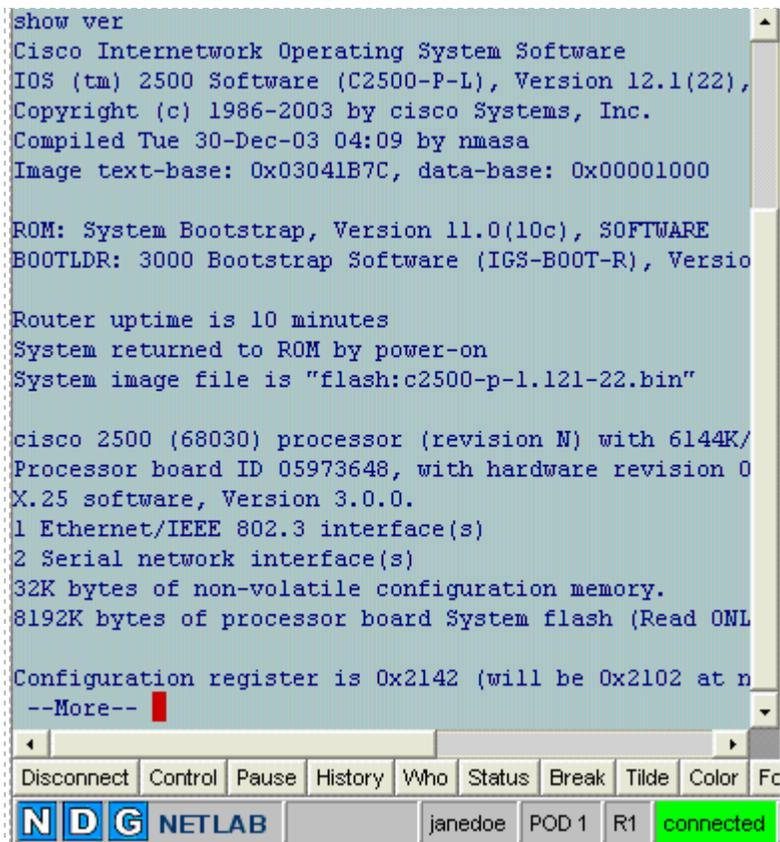
7.2.1 Remote Console Connection

Remote Console connections provide remote access to the console port of devices such as routers, switches and firewalls. These connections are established transparently through an access server. The access server is not displayed in the topology diagram. By using console ports, NETLAB+ does not depend on the configuration of the lab topology to access a device.

Console devices may be accessed from the Topology, Status or Connections tabs on the Lab Access interface (see section 8 for a detailed description of each tab). To access a device, select the Topology tab and click on the device in the drawing. Alternatively, you may use the hyperlinks on Connection tab or Status tab.

By default, NETLAB+ uses the built-in viewer. You must click inside the window prior to entering in commands.

In the following example, console access has been opened to **ROUTER1** by clicking on the device icon shown on the Topology tab displayed in 7.1. NETLAB+ opens a Remote Console viewer.



```
show ver
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-P-L), Version 12.1(22),
Copyright (c) 1986-2003 by cisco Systems, Inc.
Compiled Tue 30-Dec-03 04:09 by nmasa
Image text-base: 0x03041B7C, data-base: 0x00001000

ROM: System Bootstrap, Version 11.0(10c), SOFTWARE
BOOTLDR: 3000 Bootstrap Software (IGS-BOOT-R), Versio

Router uptime is 10 minutes
System returned to ROM by power-on
System image file is "flash:c2500-p-1.121-22.bin"

cisco 2500 (68030) processor (revision N) with 6144K/
Processor board ID 05973648, with hardware revision 0
X.25 software, Version 3.0.0.
1 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash (Read ONL

Configuration register is 0x2142 (will be 0x2102 at n
--More--
```

If a third party (local) Telnet client is configured in your NETLAB+ profile, the local Telnet application will open and ask the user to log in with the NETLAB+ user ID and password. The username and password required here are the same as the ID and password required to log into the NETLAB+ system.

```
Connecting...
Please login to NETLAB device.
Unauthorized access is prohibited.

NETLAB user ID: janedoe
NETLAB password:
```

You must **first** click on the device before attempting to log in using a local Telnet client. This action identifies the device that NETLAB+ will subsequently establish a connection to (after you provide your username and password).

NETLAB+ Telnet Applet	Correct Action	⇒ Click on the device you want to access. • NETLAB+ connects you to the device. • Login is automatic.
Local Telnet Application (3 rd party Telnet client)	Correct Action	⇒ Click on the device you want to access. • NETLAB+ invokes your Telnet client. ⇒ Enter your username and password. • NETLAB+ connects you to the device.
	Incorrect Action	⇒ Telnet directly to NETLAB+ before clicking on the device you want to access. • This will not work.

Once a connection is established, you may perform any activity supported by the device’s console port.

You must click inside the window prior to entering in commands.

```
Router>?
Exec commands:
  access-enable   Create a temporary Access-List entry
  access-profile  Apply user-profile to interface
  clear           Reset functions
  connect         Open a terminal connection
  disable        Turn off privileged commands
```

NETLAB+ Remote Console provides several unique features that can be invoked once a connection has been established.

If you are using the NETLAB+ Telnet Applet as your Remote Console viewer, you may click on any of the buttons on the Telnet Button Bar to invoke these features.



If you are using a 3rd party (local) Telnet client, you can use keyboard shortcuts to invoke a feature. Each shortcut starts with a tilde (~) followed by a letter. To send a tilde (~) to the console device, press tilde twice.

Button	Keyboard Shortcut	Description
Disconnect	~D	Terminates your connection. Other users (if any) remain connected.
Control	~C	Click once to take control of a session so other users cannot type. Click again to release control.
Pause	~P	Click once to stop the device from displaying output. Click again to resume output.
History	~H	Replays recent output from the device.
Who	~W	Lists users connected to the device.
Status	~S	Displays the status of your connection.
Break	~B	Sends a hardware break to the console device. Typically used for password recovery exercises.
Tilde	~~	Sends a tilde character to the console device.
Color	n/a	Changes the screen colors. NETLAB+ Telnet Applet only.
Font	n/a	Changes the screen font. NETLAB+ Telnet Applet only.
Help	~?	Displays this information.

Shared access to a console device is facilitated automatically as each user joins the device. Remote Console based connections (routers, switches, and firewalls) do not consume significant CPU resources and can support as many as 30 sessions.

Here, instructor Jane Doe has connected to **ROUTER1** during an instructor-led session. As her students do the same, messages indicate when each user has joined the connection.

```
*** you are connected to ROUTER1
*** press ~? for help

Trying 169.254.1.22...
Connected to 169.254.1.22.
Escape character is 'off'.

*** jsmith (John Smith) joined the connection...
*** ajones (Arnold Jones) joined the connection...
```

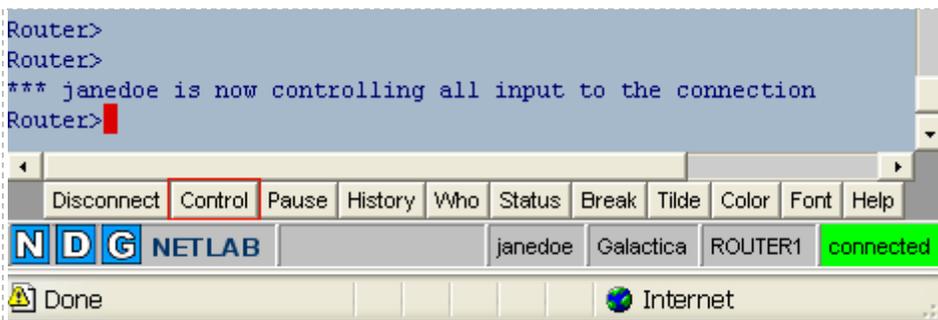
The **Control** and **Who** features are used in conjunction with session sharing.

Clicking the Control button (or keyboard shortcut) allows you to take control over the device. Other users in the session may then watch your configuration commands, but will not be able to type commands. Control can be transferred to other users during the session to allow others to make configuration changes. A user who wants to control the device should click the Control button.

Instructors have priority over students. An instructor may always take control from a student, but a student cannot take control from an instructor. Similarly, NETLAB+ automated operations have priority over both instructors and student. When NETLAB+ is performing an automated operation such as password recovery, it will take control of the session. As this happens, users can watch but not interfere with the operation.

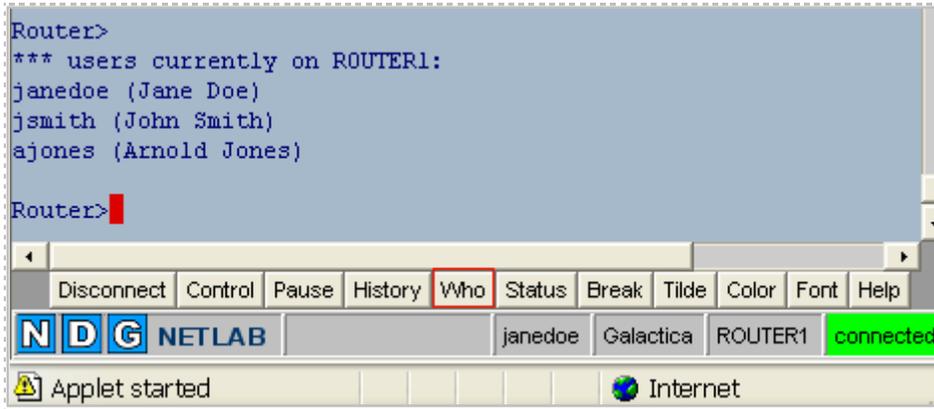
Here, Jane Doe has taken control of the device by pressing the Control button. A message will alert everyone connected that Jane has taken control of the device.

```
Router>
Router>
*** janedoe is now controlling all input to the connection
Router> █
```



Please Note: It is not necessary to take control of a device when it is being shared, but this may be helpful in preventing users from typing over each other.

Selecting the **Who** button will display a list of users currently connected to the device. This information is also displayed on the Connections tab.



```
Router>
*** users currently on ROUTER1:
janedoe (Jane Doe)
jsmith (John Smith)
ajones (Arnold Jones)
Router>
```

Disconnect Control Pause History **Who** Status Break Tilde Color Font Help

NDG NETLAB janedoe Galactica ROUTER1 connected

Applet started Internet

The **Status** button can be used to display who has control of the session and the number of connections.



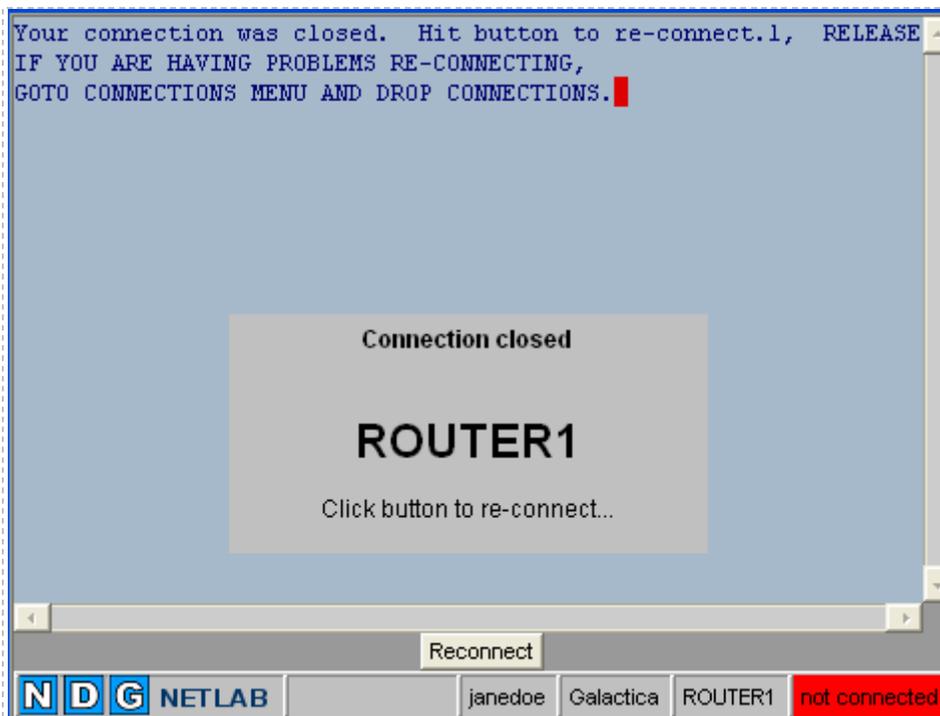
```
Router>
*** you are connected to ROUTER1
*** 2 other user(s) also connected
*** your terminal has control of the connection
*** input from other users is disabled
*** press ~? for help
Router>Router>
```

Disconnect Control Pause History Who **Status** Break Tilde Color Font Help

NDG NETLAB janedoe Galactica ROUTER1 connected

Applet started Internet

The **Disconnect** button is used to close a user's connection. If there are other users connected to the device, they will remain connected. When the connection has been closed, the reconnect button will be displayed. Here, Jane Doe has disconnected from **ROUTER1**.



Other connected users will see a message indicating that Jane has left the connection.



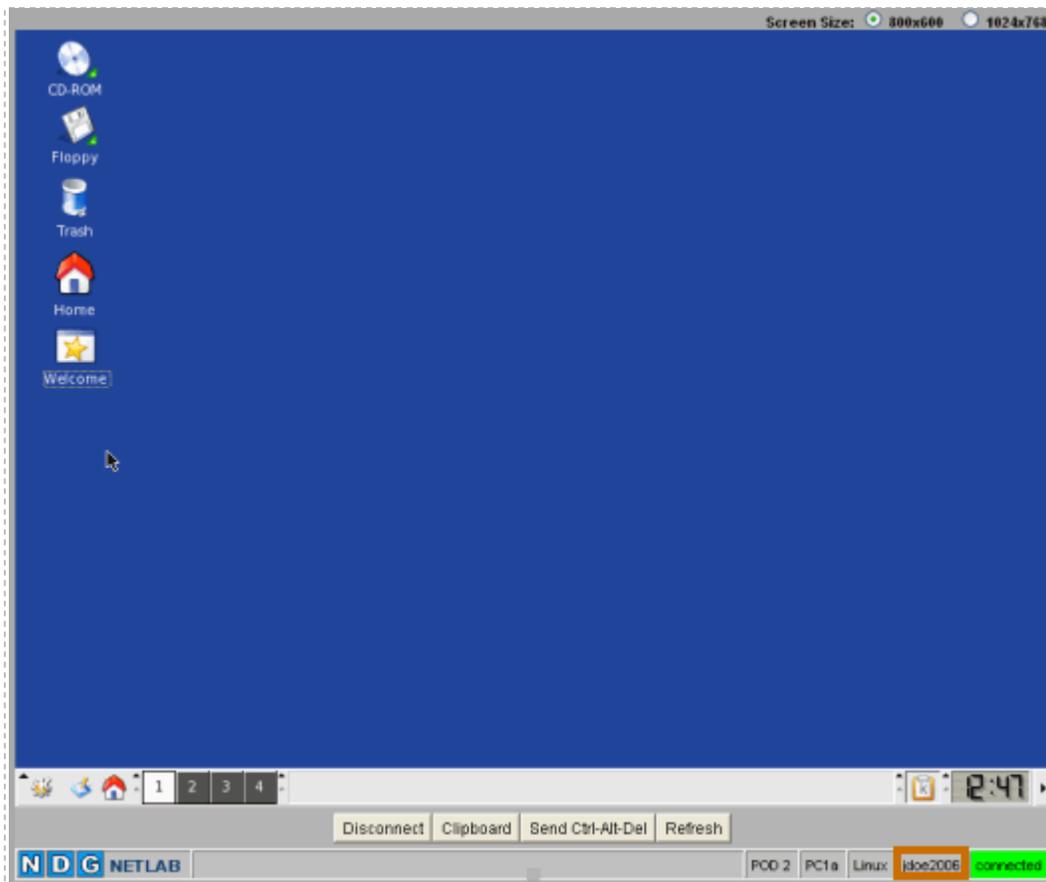
Connections can also be dropped using the function on the Connections tab (see section 8.4).

7.2.2 Connection to a PC (Remote K/V/M)

NETLAB+ can also provide a connection to a PC. A remote PC configured for *direct access* allows users to control the keyboard, video, and mouse using a Java based viewer. No special client software (other than Java) is required on the user's computer. NETLAB+ will download the viewer to the client whenever the user clicks on the PC shown in the lab topology. Please see the *NETLAB+ Remote PC Guide* for more details.

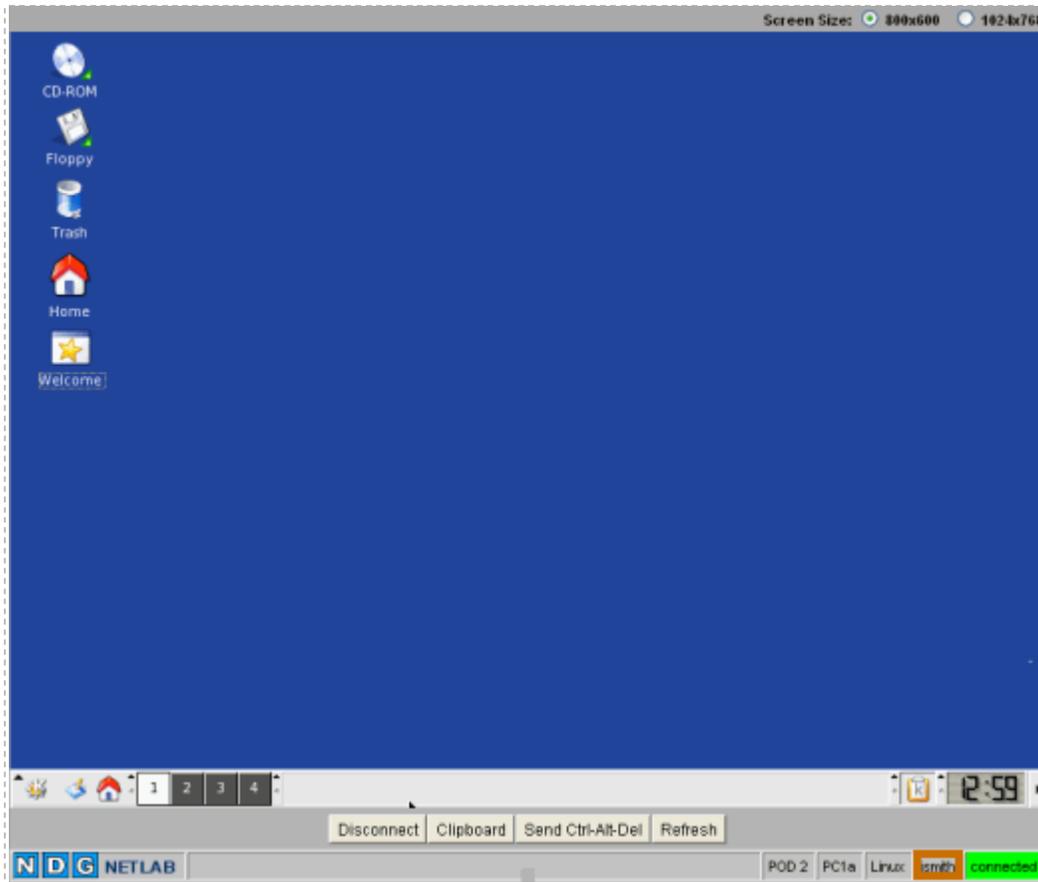
Please Note: These connections are graphically oriented and not recommended for dial-up users.

Working from the topology shown in section 7.1, instructor jdoe2006 has established a connection to remote **PC 1a**.



Session sharing is facilitated automatically by NETLAB+.

Here, student jsmith has also established a connection to **PC 1a**, and is sharing the session with instructor jdoe2006.



Please Note: Each Remote K/V/M connection consumes additional CPU processing power on the remote PC. A practical limit of 3 shared sessions on a remote PC should be observed to maintain reasonable response time.

Either user may view the list of connected users for all devices in the topology on the connections tab (see section 8.4). In this example, we can see that both Jane Doe and jsmith are connected to **PC 1b**. Jsmith has also established a connection to **R2**. Jane Doe also has connections to devices **R1**, **R3**, and **PC 1a**.

Topology	Action	Status	Connections	Load	Save	Exercise
DEVICE	TYPE	USER ID	NAME	PRIORITY		
R1	Cisco 1841 (S0/1/x)	jdoe2006	Jane Doe	3		
R2	Cisco 2801/2811 (S0/1/x)	jsmith	John Smith	1		
R3	Cisco 2801/2811 (S0/1/x)	jdoe2006	Jane Doe	3		
PC1a	Linux	jdoe2006	Jane Doe			
PC1b	Other	jdoe2006	Jane Doe			
		jsmith	John Smith			

CLICK ON THE DEVICE NAME TO OPEN A CONNECTION

 **Drop My Connections**

The button bar on the viewer provides access to several functions, **Disconnect**, **Clipboard**, **Send Ctrl-Alt-Del** and **Refresh**.

Disconnect	Clipboard	Send Ctrl-Alt-Del	Refresh
------------	-----------	-------------------	---------

To disconnect from the PC, select the **Disconnect** button. Connections can also be dropped using the function on the Connections tab (see section 8.4).

The **Clipboard** can be used to copy and paste text between the remote PC and your PC.



Please Note: To use the clipboard feature, the software on the remote PC software must also support it. Currently, VMware does not implement the clipboard.

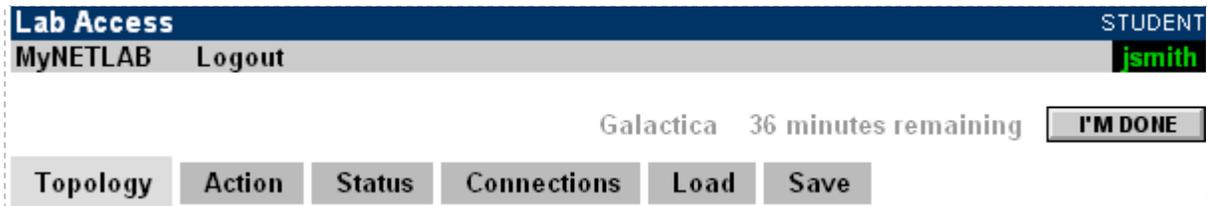
To simulate the actions of pressing Ctrl-Alt-Delete, press the **Send Ctrl-Alt-Del** button.

To refresh the view of the information you are currently displaying, select the **Refresh** button. You may find this helpful when the display appears incorrect or incomplete.

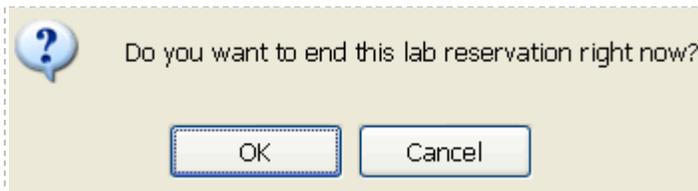
7.3 End a Reservation

When the reservation time expires, all connections will be dropped. It is important to save any configuration files prior to the session expiration if you want these files to be available for future use. Users should allow 5 minutes at the end of the session to save configuration files. See section 8.6 for information on saving configuration files.

A reservation may also be ended prior to the scheduled time by using the **We're Done** button (for team), or **I'm Done** button (for individual). These buttons will appear after initialization of the pod has been completed, at the start of a lab session. The We're Done button will appear only to the instructor for an instructor-led session.



After confirming the selection, the session will be ended.



The lab session will end immediately and any open user connections will be closed. NETLAB+ will then execute a scrub to prepare the equipment for the next reservation. After the lab scrub has completed, the scheduler will be updated to include any unused time increments of thirty minutes or more to be available for reservation.

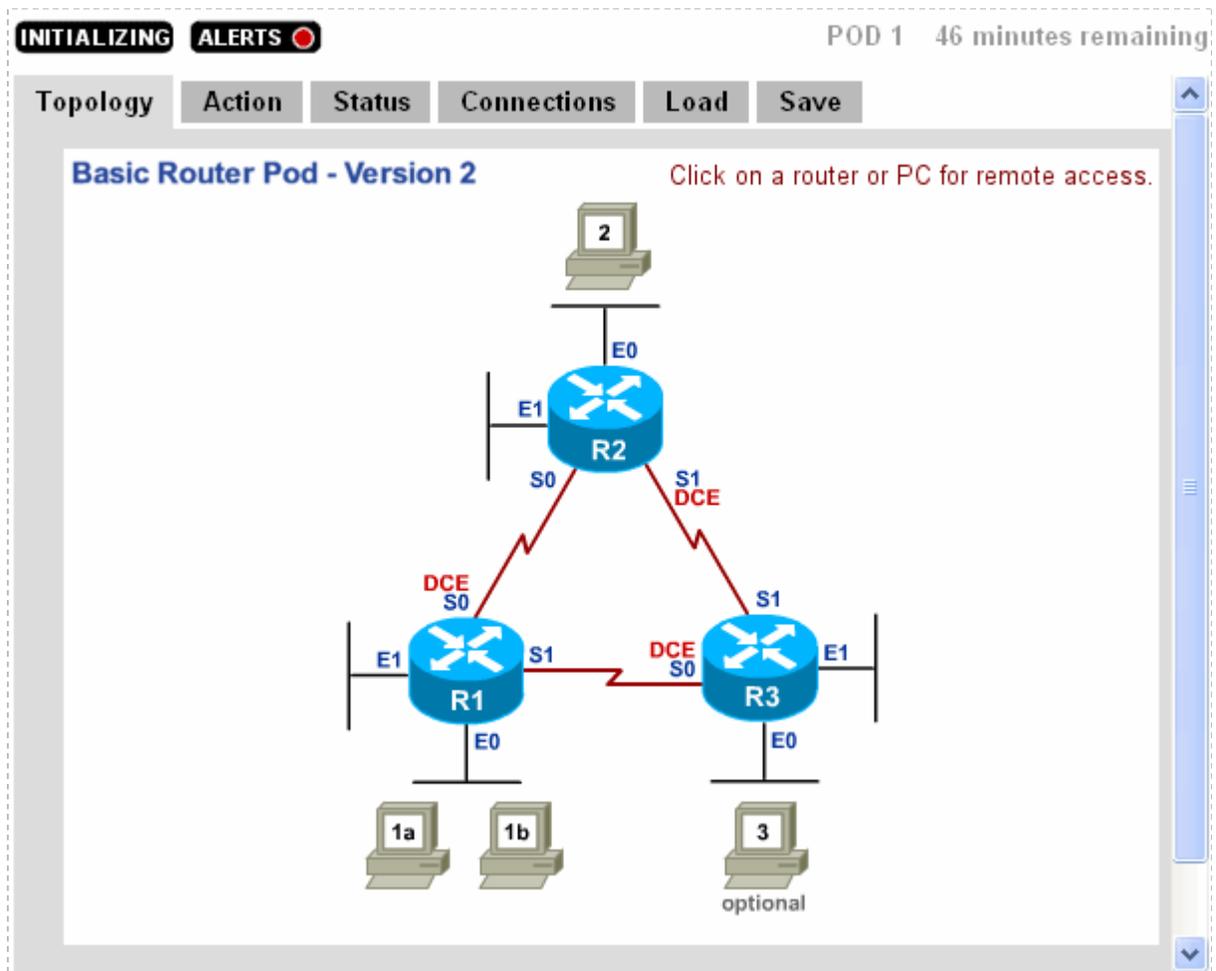
8 Sections of the Lab Access Interface

This section describes in detail the functions available on each section of the Lab Access Interface. The Lab Access Page is divided into several tabbed sections, allowing users to easily access all of NETLAB+'s functions. The **Topology**, **Action**, **Status**, **Connections**, **Load** and **Save** sections can be accessed by selecting the section name on the tab.

You will notice that some functions can be performed from several of the tabbed sections. For example, NETLAB+ devices may be accessed by opening a session through the **Topology**, **Action**, **Status** or **Connections** tabs.

8.1 Topology Tab

The **Topology** tab displays the lab topology including the IP addressing scheme and physical or logical connections. You may click on all devices configured for direct access to establish direct console or GUI access.

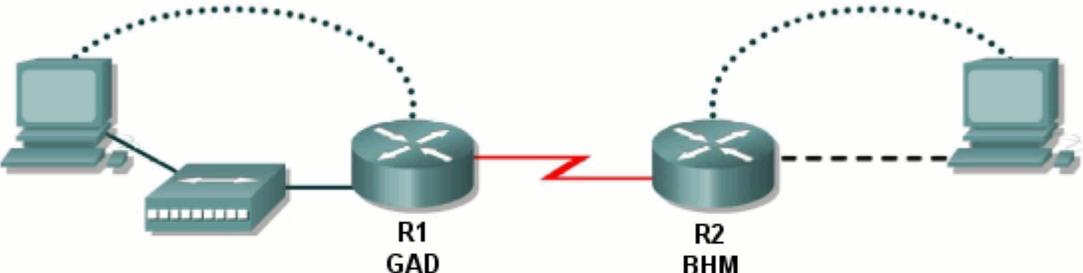


You may see an alerts indicator on the page. Selecting **Alerts** will display informational or error messages pertaining to the status of lab devices. You may see the **Initializing** indicator displayed on the page at the very beginning of your session. This indicates that NETLAB+ is in the process of initializing the lab devices in the topology to prepare them for use. See section 7.1 for more information concerning Initializing and Alerts indicators.

If a lab exercise was selected when the lab reservation was made, or if an instructor selects an exercise during an instructor-led session, the topology shown may contain graphics specific to the lab exercise.

Topology **Action** **Status** **Connections** **Load** **Save**

Click on the terminal or router icons to open console connections to the routers.



This lab is using a NETLAB Basic Router Pod.
Router R3 is not used in this lab.

Click the Show Lab Content button below to view the instructions for this lab.
The instructions are in PDF format and require the Adobe Acrobat Reader.

1.2.3 Review of Basic Router Configuration with RIP [Show Lab Content](#)

Another example of the Topology tab for a lab reservation to perform a selected lab exercise.

Topology **Action** **Status** **Connections** **Load** **Save**

Click on the router or terminal icons to open console connections to the routers.

Click the Show Lab Content button below to view the instructions for this lab.
The instructions are in PDF format and require Adobe Acrobat Reader.

2.3.6 Propagate Default Route Information in an OSPF Domain [Show Lab Content](#)

Here, we have opened a connection to R3 by clicking on the device icon shown on the Topology tab.

```
*** NETLAB (system process) departed the connection...
Router>sho ver
Cisco Internetwork Operating System Software
IOS (tm) 2500 Software (C2500-P-L), Version 12.1(22), RELEASE SO
Copyright (c) 1986-2003 by cisco Systems, Inc.
Compiled Tue 30-Dec-03 04:09 by nmasa
Image text-base: 0x03041B7C, data-base: 0x00001000

ROM: System Bootstrap, Version 5.2(8a), RELEASE SOFTWARE
BOOTLDR: 3000 Bootstrap Software (IGS-RXB00T), Version 10.2(8a),

Router uptime is 7 minutes
System returned to ROM by power-on
System image file is "flash:c2500-p-1.121-22.bin"

cisco 2500 (68030) processor (revision L) with 6144K/2048K bytes
Processor board ID 03238200, with hardware revision 00000000
X.25 software, Version 3.0.0.
1 Ethernet/IEEE 802.3 interface(s)
2 Serial network interface(s)
32K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash (Read ONLY)

Configuration register is 0x2142 (will be 0x2102 at next reload)
--More--
```

Disconnect Control Pause History Who Status Break Tilde Color Font Help

NDG NETLAB | janedoe | POD 1 | R3 | connected

8.2 Action Tab

The **Action** tab provides a convenient method to power off, power on, power recycle, scrub devices (return them to clean state) or perform automatic password recovery. Actions may be performed on single devices or the entire pod simultaneously.

The text box located on this tab displays the passwords NETLAB+ will use to access the devices. If the equipment passwords are not configured to match these, NETLAB+ may not be able to complete the requested action. If this type of error occurs, the ALERTS icon will flash. Errors can be retrieved by clicking on the icon. Also, if the equipment passwords do not match the listed passwords that NETLAB+ expects to be used in the lab, the final configuration will not be saved for instructor review or student use for a future reservation

To perform an action on one device in the topology, select the **Action** command from the drop down menu next to a single device.

NAME	TYPE	ACTION	ACTION ON ENTIRE POD
R1	Cisco 1841 (S0/1/x)	-select-	-select-
R2	Cisco 2801/2811 (S0/1/x)	-select-	-select-
R3	Cisco 2801/2811 (S0/1/x)	power off	-select-
PC1a	Linux	power on	-select-
PC1b	Other	power recycle	-select-
		scrub device	-select-
		password recover	-select-

For automated operations to work properly, please use the following passwords for lab routers, switches, and firewalls:

console: **cisco** enable secret: **class**

Selecting the Action command from the drop down menu under “**Action on Entire Pod**” will perform the selected action on each device in the topology. Connections to devices can be made from this tab by clicking the hyperlink for the device.

Topology	Action	Status	Connections	Load	Save	Exercise
NAME	TYPE	ACTION			ACTION ON ENTIRE POD	
R1	Cisco 1841 (S0/1/x)	-select-			-select-	
R2	Cisco 2801/2811 (S0/1/x)	-select-			-select-	
R3	Cisco 2801/2811 (S0/1/x)	-select-			power off	
PC1a	Linux	-select-			power on	
PC1b	Other	-select-			power recycle	
					password recover	
					scrub device	

For automated operations to work properly, please use the following passwords for lab routers, switches, and firewalls:

console: **cisco** enable secret: **class**

Routers, switches and firewalls are accessed through a console connection (see section 7.2.1). NETLAB+ also provides connectivity to PCs (see section 7.2.2). Not all actions are available on all types of devices. Certain restrictions apply when the lab device is a remote PC, depending on the type of implementation selected. Please see the *NETLAB+ Remote PC Guide* for more details.

Availability of Actions for Lab Devices:

	Console Based Router, Switch, Firewall	PC Based Direct/ VMware (GSX)	PC Based Direct/ Standalone
Power Off	Yes	Yes	No
Power On	Yes	Yes	No
Power Recycle	Yes	Yes	No
Password Recovery	Yes	N/A	N/A
Scrub Device	Yes, erases configuration.	Yes, reverts to a snapshot (built into VMware).	Yes, performs a reboot to revert to a clean state (requires third party software).

8.3 Status Tab

The status of all devices in the topology is displayed on the **Status** tab. For reservations that are instructor-led or team sessions, several users may be attached to the devices. The number of users will be displayed in the **Users** column. You can also access a device by clicking the device name.

Topology	Action	Status	Connections	Load	Save	Exercise
DEVICE	TYPE	POWER	USERS	STATUS		
R1	Cisco 1841 (S0/1/x)	ON	2	normal		
R2	Cisco 2801/2811 (S0/1/x)	ON	0	normal		
R3	Cisco 2801/2811 (S0/1/x)	ON	0	normal		
PC1a	Linux	ON	1	online		
PC1b	Other	ON	0	online		
PC2				not implemented in this pod		
PC3				not implemented in this pod		

CLICK ON THE DEVICE NAME TO OPEN A CONNECTION

8.4 Connections Tab

Device connections are shown on the **Connections** tab. For reservations that are instructor-led or team sessions, several users may be attached to devices during a lab session and their User Id and Names are displayed. Each user attached to the device is assigned a *Priority* to determine who can assert exclusive control over the devices when more than one user is sharing the device's console port. Instructors have priority over students. NETLAB+ automated operations have priority over both instructors and students. This tab also contains a button to **Drop My Connections** that allows connected users to quickly disconnect from all devices. Connections to devices can be made from this tab by clicking the device name.

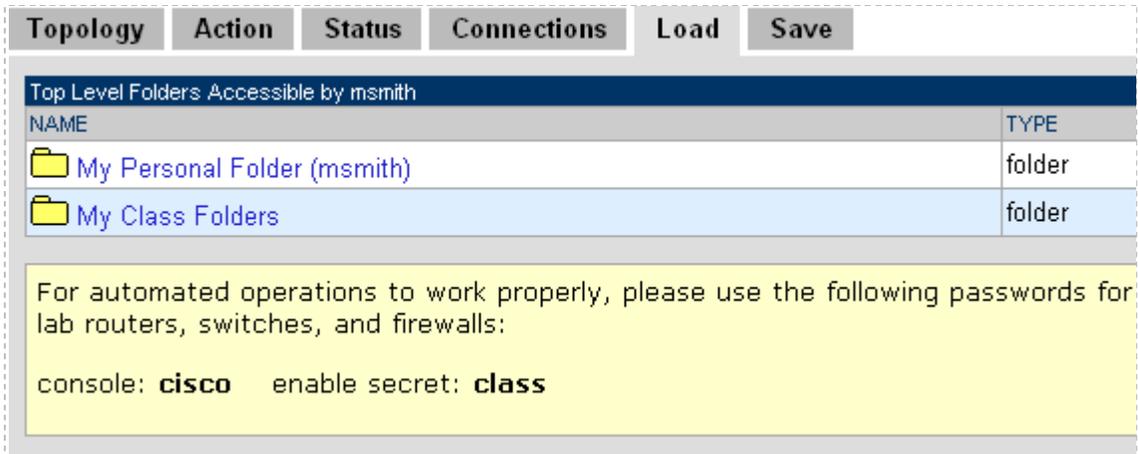
Topology	Action	Status	Connections	Load	Save	Exercise
DEVICE	TYPE	USER ID	NAME	PRIORITY		
R1	Cisco 1841 (S0/1/x)	jdoe2006	Jane Doe	3		
		jsmith	John Smith	1		
R2	Cisco 2801/2811 (S0/1/x)	-	-	-		
R3	Cisco 2801/2811 (S0/1/x)	-	-	-		
PC1a	Linux	jsmith	John Smith			
PC1b	Other	-	-	-		

CLICK ON THE DEVICE NAME TO OPEN A CONNECTION

Drop My Connections

8.5 Load Tab

The **Load** tab is used to load saved configuration files into one or more console based devices. These saved configuration files can be the result of a previously saved session, or files created and edited offline. The file path is displayed at the top of the directory list. The top-level folders allow for separation between personal and class files. Students may access both folders but may only alter the contents of their personal folder.



Selecting the **My Class Folders** link will display a shared files folder for each of your classes. These folders will contain items made available for class use by your instructor. Students may use the files to load devices. You may copy items to your personal folders (see section 9.4). Students may not edit or delete items in the shared class folders.

Here we'll select the folder for the CCNP Fall Class.



Individual configuration files are displayed along with configuration folders. Please refer to section 9 for details concerning configuration file management. Configuration folders contain configuration files for each device in a lab topology. If all devices will be configured from saved files, it is more efficient to save all device configuration files into a single folder.

In this example, there are two configuration folders in the CCNP Fall Class Shared Files folder, Configs Exercise 1 and Configs Exercise 2.

Topology	Action	Status	Connections	Load	Save
CURRENT FOLDER: CCNP Fall Class Shared Files					
NAME	TYPE	SIZE	UPDATED		
<i>go up one level</i>					
Configs Exercise 1	config folder		Fri Feb 10, 2006 11:13AM		
Configs Exercise 2	config folder		Fri Feb 10, 2006 3:26PM		
CCNP Test Commands	config	26	Thu Feb 9, 2006 11:36AM		
R1	config	812	Fri Feb 10, 2006 3:47PM		
<p>For automated operations to work properly, please use the following passwords for lab routers, switches, and firewalls:</p> <p>console: cisco enable secret: class</p>					

Select a configuration folder from the list to display the folder contents. Here, we've selected the **Configs Exercise 1** configuration folder. The folder contents are displayed.

Topology	Action	Status	Connections	Load	Save
CURRENT FOLDER: CCNP Fall Class Shared Files > Configs Exercise 1					
NAME	TYPE	SIZE	UPDATED		
<i>go up one level</i>	folder				
R1	config	813	Sat Feb 11, 2006 12:09PM		
R2	config	813	Sat Feb 11, 2006 12:09PM		
R3	config	813	Sat Feb 11, 2006 12:09PM		
<p><input type="button" value="Load All Devices"/> <input checked="" type="checkbox"/> reload with erase before loading</p>					
<p>For automated operations to work properly, please use the following passwords for lab routers, switches, and firewalls:</p> <p>console: cisco enable secret: class</p>					

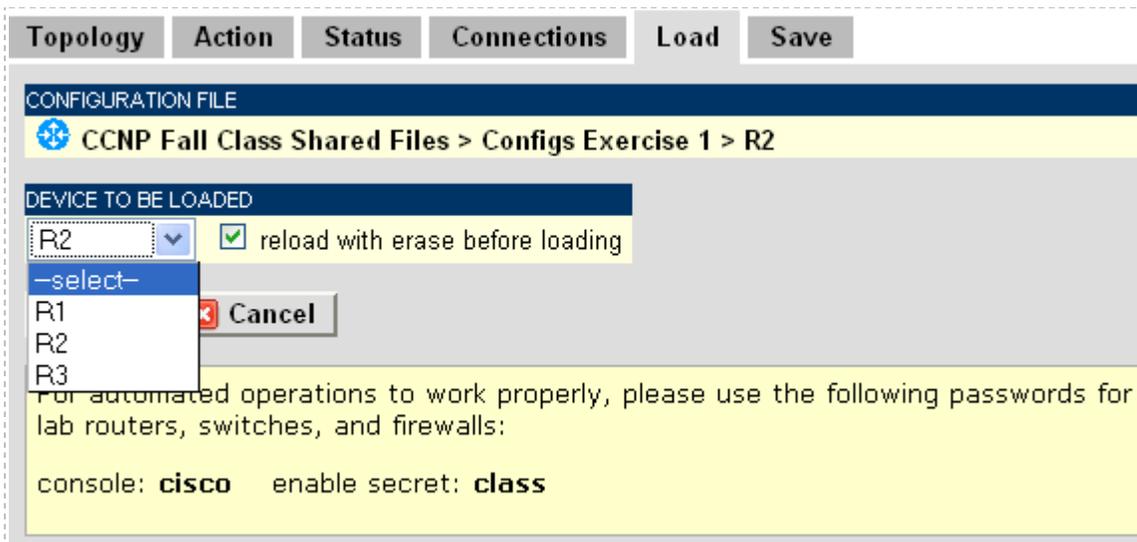
Select the **Load All Devices** button to load the configuration files for each device. You may load all devices with the saved files with the option of erasing the devices prior to loading these files. If the erase option is selected, NETLAB+ will perform a write erase/reload prior loading the selected configuration file. Erasing prior to loading files may be necessary if the passwords have been misconfigured or forgotten. If the erase option is not selected, NETLAB+ will load the overlay the configuration “on top of” the existing configuration, this process is faster but may produce “side effects” depending on the current device configuration.

A pop-up window will confirm the loading process is taking place.

- ◆ loading configuration for msmith on R1 : **Submitted**
- ◆ loading configuration for msmith on R2 : **Submitted**
- ◆ loading configuration for msmith on R3 : **Submitted**

*Your request may be delayed by other jobs.
Any errors encountered will be sent as alerts.*

There is also the option to select a file in the configuration folder to load a single device. Here, the file **R2** was selected. The file may be loaded into any selected device.

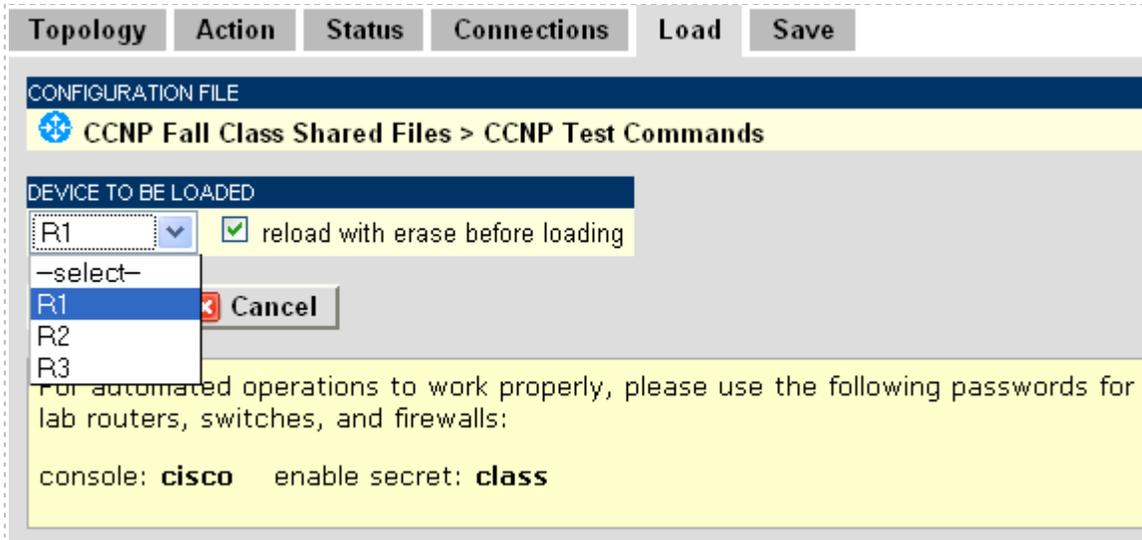


After choosing a device and selecting **OK**, a pop-up window will confirm the loading process is taking place.

- ◆ loading configuration for msmith on R2 : **Submitted**

*Your request may be delayed by other jobs.
Any errors encountered will be sent as alerts.*

In this example, the file **CCNP Test Commands** is selected. This configuration file was created by the instructor and placed in the CCNP Fall Class Shared Files folder for class use. The file may be loaded into any selected device.



After choosing a device and selecting **OK**, a pop-up window will confirm the loading process is taking place.

◆ **loading configuration for msmith on R1 : Submitted**

*Your request may be delayed by other jobs.
Any errors encountered will be sent as alerts.*

The page also displays the passwords that NETLAB+ will use to access the devices for the loading process. If the currently configured passwords do not match these, NETLAB+ may be unable to access the devices to load the files.

Note: This does not apply to Remote PCs.

Please Note: Files are only loaded from this screen; they cannot be edited here. To edit files the student must use the File Manager accessible from the MyNETLAB main page.

8.6 Save Tab

The **Save** tab is used to save the configuration files of one or more console based devices into selected folders that reside on the NETLAB+ server. Configurations can be saved at any point in the lab reservation. There are two options when saving configuration files. A configuration folder can be created to hold the configuration files for all devices or files for specific devices can be saved individually. To manage configuration files, please refer to section 9.

Topology Action Status Connections Load Save

CURRENT FOLDER (configurations saved here)

msmith Change Folder

SAVE ALL (enter a folder name)

Homework Assignment 1 Save All

DEVICE	FILE NAME	
R1	R1	Save
R2	R2	Save
R3	R3	Save

Overwrite existing configurations

For automated operations to work properly, please use the following passwords for lab routers, switches, and firewalls:

console: **cisco** enable secret: **class**

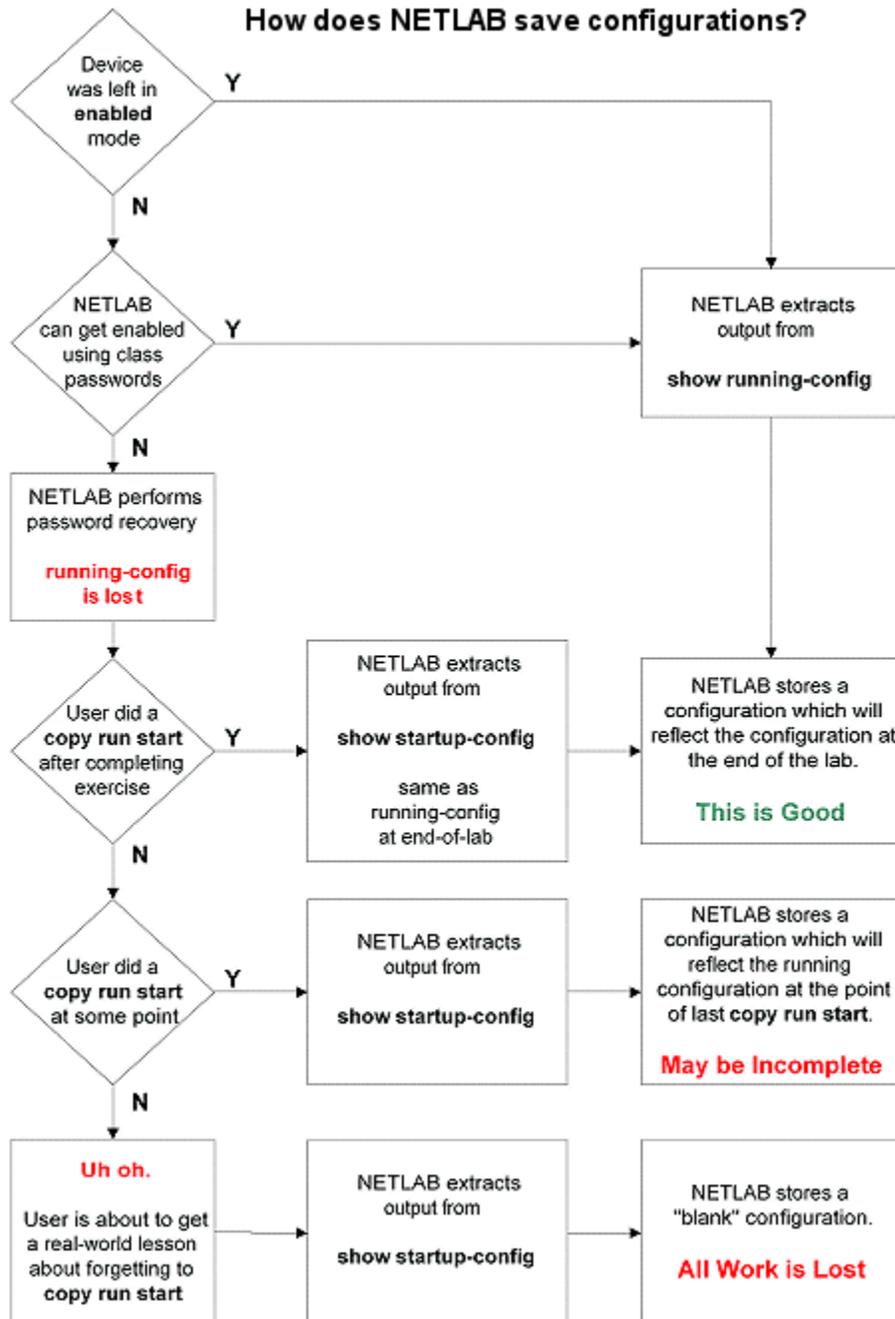
Select the **Save All** option to save configuration files for each device into a configuration folder. You must enter a folder name in the box to the left of the **Save All** button.

Configuration files devices can also be saved individually. The descriptive file name may be edited in the text box prior to clicking the **Save** button next to the device. The configuration file will be saved in the listed directory. Files can be overwritten depending on the state of the overwrite checkbox.

Use the **Change Folder** button if you wish to navigate to another directory location, prior to saving folders or files. The folder structure is hierarchical and can be used to save the configurations from multiple sessions. These files can later be retrieved, edited, or loaded into devices in the topology.

The flowchart below illustrates the process that NETLAB+ will follow to automatically save lab configurations at the end of a reservation. The configuration is automatically restored for the next reservation (of the same type) when the **Restore from Last Saved**

Config option is selected while confirming the reservation. If the device passwords are correct (i.e. match NETLAB+'s), the saved configurations will reflect the “running-config”. If the device passwords are not correct, NETLAB+ will save the “startup-config” based on the last “copy run start”.



9 File Manager



The File Manager is used to view add, change, or delete configuration files and folders NETLAB+ can upload and download *configuration files* to devices in the lab. These files are stored in NETLAB+ 's *file system*. To access the file manager, select **File** on the MyNETLAB menu bar.



NETLAB+ can upload and download *configuration files* to devices in the lab. These files are stored in NETLAB+'s *file system*.

To avoid reliance on the lab topology and state, NETLAB+ performs these operations through the console port on each device. 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. When saving a configuration, NETLAB+ captures the output from the 'show running' or equivalent commands

 *Configuration Files* contain the actual device configurations.

 *Ordinary Folders* may contain other ordinary folders, configuration folders, and configuration files.

 *Configuration Folders* are special folders used for 'Load All' and 'Save All' operations.

- When you issue a 'Load All' request to NETLAB+, you are requesting that the entire equipment pod be loaded with configuration files from a named configuration folder. Any configuration files whose file name matches the name of the device are loaded into the device. Configuration files whose names do not match a device name are not loaded in a 'Load All' operation.
- When you issue a 'Save All' request to NETLAB+, you are requesting that the configuration of each device in the equipment pod be saved. NETLAB+ will create a configuration folder using the name specified and create a configuration for each device in this folder. The name of each configuration file will match the name of the device from which it was saved.

9.1 Open Configuration Files

The top-level folders allow for separation between personal and class files. The top-level folders cannot be modified. You have read access to the shared class folders set up for each class by your instructors. As a student, you may only alter the contents of your personal folder.

My Configuration Files

- ◆  Clicking on a folder file changes the current folder
- ◆  Clicking on a configuration file opens the file for viewing or editing

Top Level Folders Accessible by msmith	
NAME	TYPE
 My Personal Folder (msmith)	folder
 My Class Folders	folder

 Due to access restrictions, you can not create, modify or delete files and folders here.

[!\[\]\(02616ff618c32064771553305c849377_img.jpg\) Return to MyNETLAB](#)

Selecting the **My Class Folders** folder displays the shared folder for each class. The files in the class shared folders may be accessed by students. You 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.

My Class Folders (msmith)

NAME
 go up one level
 CCNP Fall Class Shared Files
 FNS review class Shared Files

The contents of the CCNP Fall Class Shared files folder is shown here.

CURRENT FOLDER: CCNP Fall Class Shared Files				
SELECT	NAME	TYPE	SIZE	UPDATED
	go up one level			
<input type="checkbox"/>	Configs Exercise 1	config folder		Fri Feb 10, 2006 11:13AM
<input type="checkbox"/>	Configs Exercise 2	config folder		Fri Feb 10, 2006 3:26PM
<input type="checkbox"/>	CCNP Test Commands	config	26	Thu Feb 9, 2006 11:36AM
<input type="checkbox"/>	R1	config	813	Fri Feb 10, 2006 3:16PM

Here we select the **R1** configuration file by clicking on the file name. As indicated, this file is opened in **read only** access. The file is in a class shared directory and cannot be edited by a student.

```

CCNP Fall Class Shared Files > R1 (read only)
!! NETLAB saved configuration: time="2006-02-10 15:49:49 UTC" elapsed=
!! device="R1" user="CCNP Fall Class" reservation="908"
!! config_location="RUNNING" hardware="C1841-S01"
!!
!
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Router
!
boot-start-marker
boot-end-marker
!
!
no aaa new-model
!
resource policy
!
mmi polling-interval 60
no mmi auto-configure
no mmi nvc

```

Close

Here, the contents of student msmith's personal folder are displayed. Students may modify the contents of their personal folder.

CURRENT FOLDER: msmith				
SELECT	NAME	TYPE	SIZE	UPDATED
	<i>go up one level</i>			
<input type="checkbox"/>	.LAST_SAVED_BRPV2	config folder		Mon Feb 6, 2006 7:20PM
<input type="checkbox"/>	Assignment One	config folder		Sun Feb 19, 2006 9:50AM
<input type="checkbox"/>	Sample Commands	config	792	Sun Feb 19, 2006 9:51AM

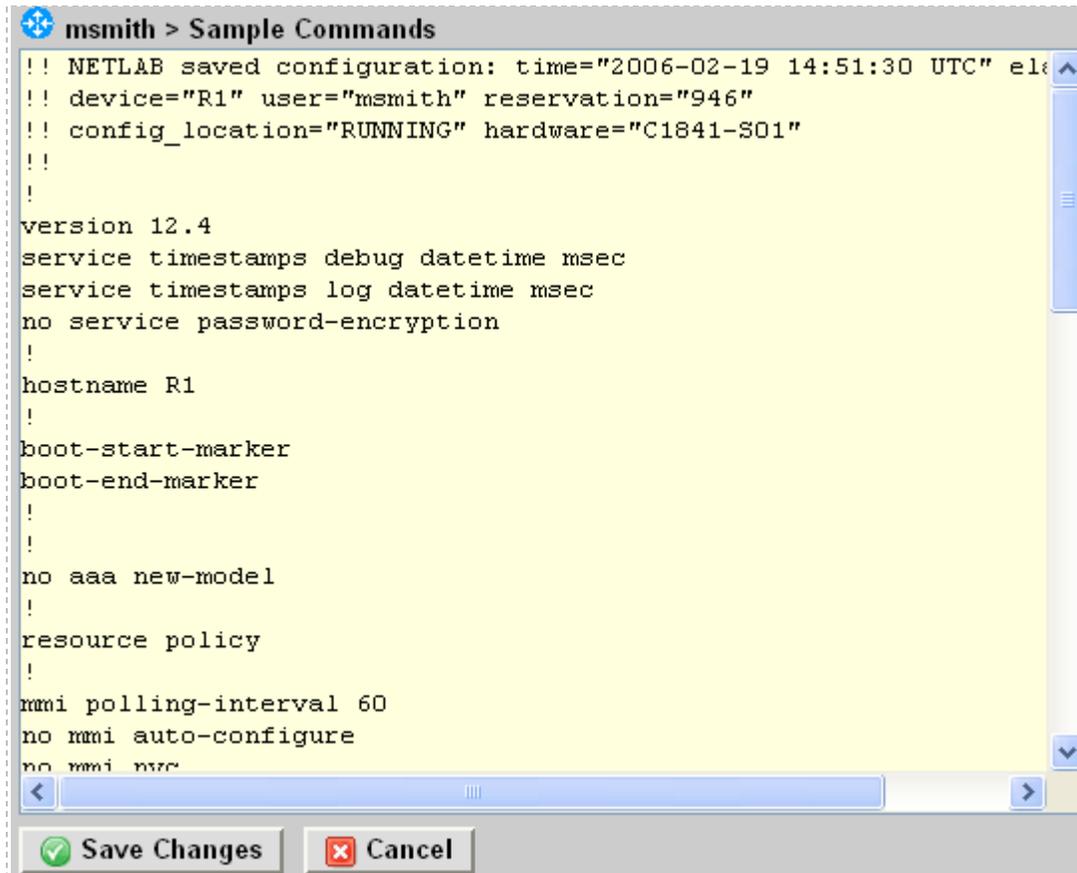
The **Sample Commands** configuration file is displayed after selecting the file name link.

```

msmith > Sample Commands
!! NETLAB saved configuration: time="2006-02-19 14:51:30 UTC" el
!! device="R1" user="msmith" reservation="946"
!! config_location="RUNNING" hardware="C1841-S01"
!!
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname R1
!
boot-start-marker
boot-end-marker
!
!
no aaa new-model
!
resource policy
!
rmi polling-interval 60
no rmi auto-configure
no rmi nvr

```

Select **Edit This File** in order to make modifications.



```
msmith > Sample Commands
!! NETLAB saved configuration: time="2006-02-19 14:51:30 UTC" el
!! device="R1" user="msmith" reservation="946"
!! config_location="RUNNING" hardware="C1841-S01"
!!
!
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname R1
!
boot-start-marker
boot-end-marker
!
!
no aaa new-model
!
resource policy
!
nmi polling-interval 60
no nmi auto-configure
no nmi nrc
```

Save Changes Cancel

Select **Save Changes** to save the modified version or **Cancel** to exit without saving.

9.2 Creating Folders and Files

Using the File Manager, you can create a configuration file or folder outside of a lab session by creating, naming, and editing the file or folder. You may find it useful to create a configuration file offline when you want to practice your router commands or create files to use in later sessions. These files can be created 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.

In this example, we'll create a new configuration folder in the current directory. Configuration folders provide a convenient way to store and access configuration files for a topology (see section 9). Select the list item, **Create new configuration folder** and then select **Go**.

My Configuration Files

- ◆  Clicking on a folder file changes the current folder
- ◆  Clicking on a configuration file opens the file for viewing or editing

CURRENT FOLDER: msmith				
SELECT	NAME	TYPE	SIZE	UPDATED
	 <i>go up one level</i>			
<input type="checkbox"/>	 .LAST_SAVED_BRPV2	config folder		Mon Feb 6, 2006 7:20PM
<input type="checkbox"/>	 Assignment One	config folder		Sun Feb 19, 2006 9:50AM
<input type="checkbox"/>	 Sample Commands	config	792	Sun Feb 19, 2006 9:51AM

<- perform action on this folder ->

<- perform action on this folder ->
 Create new configuration file
 Create new ordinary folder
Create new configuration folder
 Add selected items to copy list
 Delete selected items

Specify the name of the new folder and then select the **Create** button.

CURRENT FOLDER (new folder is created here)

msmith

NEW FOLDER NAME (required)	TYPE
Assignment Two	 Configuration Folder

The **Assignment Two** configuration folder is now displayed in the directory list..

CURRENT FOLDER: msmith				
SELECT	NAME	TYPE	SIZE	UPDATED
	 <i>go up one level</i>			
<input type="checkbox"/>	 .LAST_SAVED_BRPV2	config folder		Mon Feb 6, 2006 7:20PM
<input type="checkbox"/>	 Assignment One	config folder		Sun Feb 19, 2006 9:50AM
<input type="checkbox"/>	 Assignment Two	config folder		Sun Feb 19, 2006 1:36PM
<input type="checkbox"/>	 Sample Commands	config	792	Sun Feb 19, 2006 9:51AM

In this example, a new ordinary folder will be added to the directory. Creating ordinary folders will allow you to create a custom hierarchical structure to organize your configuration files and configuration folders.

CURRENT FOLDER: msmith				
SELECT	NAME	TYPE	SIZE	UPDATED
	go up one level			
<input type="checkbox"/>	.LAST_SAVED_BRPV2	config folder		Mon Feb 6, 2006 7:20PM
<input type="checkbox"/>	Assignment One	config folder		Sun Feb 19, 2006 9:50AM
<input type="checkbox"/>	Assignment Two	config folder		Sun Feb 19, 2006 1:36PM
<input type="checkbox"/>	Sample Commands	config	792	Sun Feb 19, 2006 9:51AM

<- perform action on this folder -> Go My Top Level Folders Refresh List

<- perform action on this folder ->
 Create new configuration file
Create new ordinary folder
 Create new configuration folder
 Add selected items to copy list
 Delete selected items

Enter the name of the new ordinary folder and then select the **Create** button.

CURRENT FOLDER (new folder is created here)	
msmith	
NEW FOLDER NAME (required)	TYPE
Practice Exam	Folder

Create Cancel

The **Practice Exam** folder is now listed in the directory.

CURRENT FOLDER: msmith				
SELECT	NAME	TYPE	SIZE	UPDATED
	<i>go up one level</i>			
<input type="checkbox"/>	Practice Exam	folder		
<input type="checkbox"/>	.LAST_SAVED_BRPV2	config folder		Mon Feb 6, 2006 7:20PM
<input type="checkbox"/>	Assignment One	config folder		Sun Feb 19, 2006 9:50AM
<input type="checkbox"/>	Assignment Two	config folder		Sun Feb 19, 2006 1:36PM
<input type="checkbox"/>	Sample Commands	config	792	Sun Feb 19, 2006 9:51AM

Here, we'll create a new configuration file. Select the list option, **Create new configuration file** and then select **Go**.

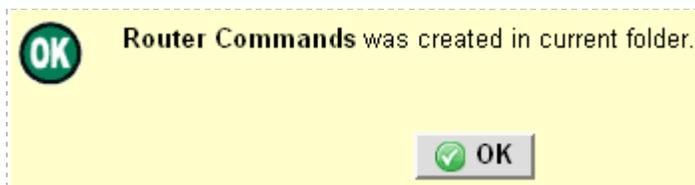
CURRENT FOLDER: msmith				
SELECT	NAME	TYPE	SIZE	UPDATED
	<i>go up one level</i>			
<input type="checkbox"/>	Practice Exam	folder		
<input type="checkbox"/>	.LAST_SAVED_BRPV2	config folder		Mon Feb 6, 2006 7:20PM
<input type="checkbox"/>	Assignment One	config folder		Sun Feb 19, 2006 9:50AM
<input type="checkbox"/>	Assignment Two	config folder		Sun Feb 19, 2006 1:36PM
<input type="checkbox"/>	Sample Commands	config	792	Sun Feb 19, 2006 9:51AM

<- perform action on this folder ->	<input type="button" value="Go"/>	My Top Level Folders	Refresh List
<ul style="list-style-type: none"> <- perform action on this folder -> Create new configuration file Create new ordinary folder Create new configuration folder Add selected items to copy list Delete selected items 			

The Configuration File Edit Page will be displayed. You will be required to enter a file name. After entering in CLI commands, select **Save** to store the configuration file.

CURRENT FOLDER (new file is created here)	
msmith	
FILE NAME (required)	TYPE
Router Commands	Configuration File
CLI COMMANDS	
show version	

A confirmation message will indicate that the file has been saved in the current folder.



9.3 Deleting Files and Folders

To delete items in the current directory, select the box to the left of the file and/or folder name. From the drop-down menu list, select **Delete Selected Items** and then click the **Go** button.

CURRENT FOLDER: msmith				
SELECT	NAME	TYPE	SIZE	UPDATED
	<i>go up one level</i>			
<input type="checkbox"/>	Practice Exam	folder		
<input type="checkbox"/>	Exercise 1	config folder		Mon Feb 20, 2006 10:11AM
<input type="checkbox"/>	Exercise 2	config folder		Fri Feb 24, 2006 11:55AM
<input checked="" type="checkbox"/>	Exercise 3	config folder		Fri Feb 24, 2006 11:48AM
<input type="checkbox"/>	Lecture Exercise	config folder		Mon Feb 20, 2006 11:03AM
<input checked="" type="checkbox"/>	Config Practice R1	config	9	Fri Feb 24, 2006 11:52AM
<input type="checkbox"/>	Sample Commands	config	621	Fri Feb 24, 2006 11:47AM

<- perform action on this folder -> Go My Top Level Folders Refresh List

<- perform action on this folder ->
 Create new configuration file
 Create new ordinary folder
 Create new configuration folder
 Add selected items to copy list
Delete selected items

Confirm that you wish to delete the items by selecting the **OK** button.

Delete selected files / folders / sub-folders?

9.4 Copying Files

The NETLAB+ File Manager includes a process that allows you to easily copy files from one folder to another. This can be useful if you wish to create new configuration files by editing copies of existing files.

In this example, we will copy the configuration files from the **Exercise 1** folder. Select the files to be copied by click the select box to the left of each file name. From the drop-down menu list, select **Add selected items to copy list** and then click the **Go** button.

CURRENT FOLDER: msmith > Exercise 1				
SELECT	NAME	TYPE	SIZE	UPDATED
	go up one level	folder		
<input checked="" type="checkbox"/>	R1	config	581	Mon Feb 20, 2006 10:11AM
<input checked="" type="checkbox"/>	R2	config	665	Mon Feb 20, 2006 10:11AM
<input checked="" type="checkbox"/>	R3	config	665	Mon Feb 20, 2006 10:11AM
<input type="checkbox"/>	Test	config	581	Mon Feb 20, 2006 10:45AM

<- perform action on this folder ->

- <- perform action on this folder ->
- Create new configuration file
- Create new ordinary folder
- Create new configuration folder
- Add selected items to copy list**
- Delete selected items

The three selected items have been added to the copy list.

Copy List

There are **3** items in your copy list.

You may display a list of the items in the copy list by selecting the **Show Items** button.

COPY LIST (3 items)		
SELECT	FILE	STATUS
<input type="checkbox"/>	 msmith > Exercise 1 > R1	ready to copy
<input type="checkbox"/>	 msmith > Exercise 1 > R2	ready to copy
<input type="checkbox"/>	 msmith > Exercise 1 > R3	ready to copy

Next, traverse the directory structure to make the **Exercise 2** folder the current folder. The files in the copy list will be copied to this folder by selecting **Paste to Current Folder** button on the copy list box.

Use the *file manager* to manage configuration files for your lab device. The [help](#) page contains a complete description of this feature.

My Configuration Files

-  Clicking on a folder file changes the current folder
-  Clicking on a configuration file opens the file for viewing or editing

Copy List

There are **3** items in your copy list.

CURRENT FOLDER: msmith > Exercise 2				
SELECT	NAME	TYPE	SIZE	UPDATED
<input type="checkbox"/>	 go up one level	folder		

Confirm that you wish to copy the files into the current folder by selecting the **OK** button.

 Paste 3 item(s) in copy buffer to current folder?

A list of the items copied will be displayed with the status of the copy process for each item.

COPY LIST (3 items)		
SELECT	FILE	STATUS
<input type="checkbox"/>	 msmith > Exercise 1 > R1	copied OK
<input type="checkbox"/>	 msmith > Exercise 1 > R2	copied OK
<input type="checkbox"/>	 msmith > Exercise 1 > R3	copied OK

The copied files are now listed in the directory of the **Exercise 2** folder.

CURRENT FOLDER: msmith > Exercise 2				
SELECT	NAME	TYPE	SIZE	UPDATED
	 <i>go up one level</i>	folder		
<input type="checkbox"/>	 R1	config	581	Fri Feb 24, 2006 12:09PM
<input type="checkbox"/>	 R2	config	665	Fri Feb 24, 2006 12:09PM
<input type="checkbox"/>	 R3	config	665	Fri Feb 24, 2006 12:09PM

Clear out the items in the copy list by selecting the **Clear List** button.

Copy List

There are **3** items in your copy list.

9.5 Interface Name Translation

Your NETLAB+ server may contain pods containing Cisco routers. The IOS commands used to configure router interfaces for one hardware type may not be compatible with other hardware types in your pods. For example, if you have 2600 series routers in Pod A and 2500 series routers in Pod B, a configuration file created with commands compatible with the 2600 series routers will not work if loaded into the 2500 series routers. The interface commands below illustrate this incompatibility.

Configuring an Ethernet interface on a **2600 series** router:

```
2600_router# interface fastethernet 0/0
2600_router# ip address 10.10.10.2
```

Configuring an Ethernet interface on a **2500 series** router:

```
2500_router# interface ethernet 0
2500_router# ip address 10.10.10.2
```

NETLAB+ Academy Edition pod types support *interface name translation*. This feature allows configuration files saved by NETLAB+ to be loaded, without errors, on a different pod with different router types. As a configuration is loaded, NETLAB+ will substitute the correct interface names for the actual router types being used (if necessary). To do this, NETLAB+ maintains a fixed table of interface names that should present on each router model. This may influence the selection of modular interface cards and slot placement within the router.

Configuration files and folders created during lab sessions using the Save tab of the Lab Access interface will contain metadata allowing the configuration commands to work with multiple router hardware platforms. Using the Save tab (see section 8.6) will ensure that configuration files and folders will work across router hardware types.

10 Curriculum Content For NETLAB_{AE}



NETLAB_{AE} allows participants in the Cisco Networking Academy Program® to view curriculum content within the NETLAB_{AE} environment.

Select **Curriculum** on the MyNETLAB menu bar.



Available curriculum will be displayed in a list and can be selected by clicking on the subject name. Students will only see curriculum for courses in which they are enrolled.

Please Note: Only pre-installed curriculum modules are shown. The NETLAB_{AE} administrator can add and remove curriculum modules as desired. Consult your instructor if you have questions about the availability of curriculum subjects.

CURRICULUM LIST		
SUBJECT	LANGUAGE	COMMENTS
▶ CCNA v2.1.2 - Semester 4	French	
▶ CCNA1 v3.1	English	
▶ CCNA1 v3.1 accessible	English	
▶ CCNP1 Bridge Course v3.0	English	
▶ CCNP1 v3.0	English	
▶ FNSP v1.2	English	
▶ FNSR v1.2	English	
▶ GLN Orientation v2.0	English	
▶ IT Essentials 1 v3.0	English	
▶ IT Essentials 2 v2.0	English	

You will be required to enter your user ID and password..

CCNA1 v3.1 accessible - please enter your NETLAB user ID and password to access

User name:

Password:

Remember my password

The selected curriculum will then be displayed.

Modules

Take the CCNA 3 Curriculum Tour

CCNA 3: Switching Basics and Intermediate Routing v3.1

CCNA3: Switching Basics and Intermediate Routing is the third of four courses leading to the Cisco Certified Network Associate (CCNA) certification. The course focuses on advanced IP addressing techniques (Variable Length Subnet Masking (VLSM)), intermediate routing protocols (RIP v2, single-area OSPF, EIGRP), command-line interface configuration of switches, Ethernet switching, Virtual LANs (VLANs), Spanning Tree Protocol (STP), and VLAN Trunking Protocol (VTP).

11 Log Out



To log out of the NETLAB+ system, select **Logout** on the MyNETLAB menu bar, or the link in the body of the page.



Logging out of the system when you have completed using NETLAB+ will prevent others from accessing your profile information from a previous connection.