

What is a CLI?

A CLI is another way for you to interact with your computer (instead of clicking around with a mouse (i.e. GUI (graphical user interface))).

What is a GUI?

Before explaining what a CLI is, it is helpful to understand its opposite. A GUI (**G**raphical **U**ser **I**nterface) is when you use a mouse to click on different things (browser, desktop, etc..) on your computer. This *user interface* is one way you can use your computer. A GUI executes commands/applications when you click on things.

CLI

Before a GUI existed there was only one way to interact with your computer, a CLI (**C**ommand **L**ine **I**nterface). This uses a shell (don't worry, this will be explained in a second) to execute commands you tell it to run.

Shell

The shell interprets commands that you type into your terminal. For example the cd command tells your shell to **c**hange **d**irectories to another folder. Typing your commands into your shell *is* your experience with your CLI. Examples of shells are powershell, cmd (Windows Command Prompt), bash, zsh, etc..

Terminal

Your terminal is the actual application that launches your shell and your CLI experience. For example on linux you can launch "Gnome Terminal" to start your bash shell (which is your CLI experience).

Windows is a bit more complicated, because they overload the same words. So, you launch the powershell application to give you a powershell shell (which is your CLI experience). 😅

Extra resources

- https://youtu.be/mUXVBMhr7Xg
- https://en.wikipedia.org/wiki/Command-line_interface
- https://en.wikibooks.org/wiki/A-level_Computing/CIE/Computer_systems,_communications_and_software/System_software/User_interfaces



OverTheWire

The OverTheWire community offers several different **wargames** that give you a fun way to learn and practice different security concepts. We will look at the **Bandit** wargame in this workshop to learn some of the basic commands on a Linux CLI. We only go through Level 5, but feel free to keep going and try the rest of the levels on your own or with a group!

In these levels, you will read the prompt and utilize the resources listed to figure out what commands you need to run and how to do that. Different passwords will be present in various places that you find by running the right commands, and you use the password you find at each level to reach the next level.

The commands needed are listed below, but don't cheat yourself! The whole point is to learn by doing, so only use these if you really get stuck and can't figure it out. If you do need to use the commands cheat list, highlight to view and copy them. Make sure to check out some **other awesome resources** at the bottom of this doc if you want to go further and need some tutorials.

Important Notes

Check out their Notes for Beginners **here**.

> You will encounter many situations in which you have no idea what you are supposed to do. **Don't panic! Don't give up!** The purpose of this game is for you to learn the basics. Part of learning the basics, is reading a lot of new information.

Bandit Level 0

To get started, follow the instructions **here**.
Hint: Use the format <connection type> <port> <username>@<hostname>
Use the resources listed to find out how to specify the port number

STEPS

1. Connect to the game using SSH
   [redacted]
2. Confirm you want to continue connecting
   [redacted]
3. Enter password given in prompt
   NOTE: You won't see any feedback, just type the password and hit ENTER
   [redacted]



4. Should be able to confirm you are now logged in if you see the following

```
bandit0@bandit:~$
```

GENERAL NOTES

If you want to logout, you can type **`exit`** and should see the following:

```
bandit0@bandit:~$ exit
logout
Connection to bandit.labs.overthewire.org closed.
```

Each level will involve you repeating the login process with the new-found password and new username. The username will be an increasing # for “bandit#” (examples: bandit1, bandit2). The password will be a string of characters found by following the prompt for the current level.

To Login to Next Level

1. End connection to current level
   `$ exit`

2. Connect to the game using SSH
   NOTE: Replace ”X” in “banditX” with the next level number (example: bandit1)
   `$ ssh -p 2220 banditX@bandit.labs.overthewire.org`

3. Enter password found on current level
   Powershell: CTRL + C to copy and then right click your mouse to paste and hit ENTER.
   OSX: It should be Command + C to copy and then Command + V to paste.
   Linux: (In most distros) you can use Ctrl + Shift + C to copy and then Ctrl + Shift + v to paste.

4. Should be able to confirm you are now logged in if you see the following:

```
  Enjoy your stay!

bandit1@bandit:~$
```

Fun CLI Shortcuts: You can use the ⬆️to use previous commands, so you don’t have to type them again. Then you can you your ⬅️ and ➡️ to get to a place in the command if you want to edit it before hitting ENTER. Note: This will only work for commands that were run in your current shell.

COMMAND LINE >_GAMES

Bandit Level 0 → 1

To get started, follow the instructions **here**.
*Hint: We want to figure out where the **readme** file is and see its contents.*

STEPS

1. Locate the readme file
   [redacted]
2. Print its contents
   [redacted]
3. Copy the password and use it to **login to the next level**

Fun CLI Shortcuts: Once you start typing a filename, you can hit TAB to autocomplete. If the first option that pops up is not the filename you want, you can keep hitting it to cycle through more results. Try it with step 2 for this level!

Bandit Level 1 → 2

To get started, follow the instructions **here**.
*Hint: We want to figure out where the **-** file is and see its contents, but printing its file contents is slightly different with how it is named.*

STEPS

1. Locate the **-** file
   [redacted]
2. Print its contents
   [redacted]
3. Copy the password and use it to **login to the next level**

COMMAND LINE >_GAMES

Bandit Level 2 → 3

To get started, follow the instructions **here**.
*Hint: We want to figure out where the **spaces in this filename** file is and see its contents, but printing its file contents is slightly different with how it is named.*

STEPS

1. Locate the **-** file
   [redacted]
2. Print its contents
   [redacted]
3. Copy the password and use it to **login to the next level**

Fun CLI Shortcuts: If you use the previous shortcut with step 2 of this level, it will autocomplete another way you can specify a filename with spaces in it. Try it!

Bandit Level 3 → 4

To get started, follow the instructions **here**.
Hint: We need to learn how to display hidden files in a directory. Directories (aka folders) typically are colored whereas filenames are not.

STEPS

1. Locate the **inhere** directory
   [redacted]
2. Move into the **inhere** directory
   [redacted]
3. Print all files, including hidden ones
   [redacted]
4. Print the contents of the file you find
   [redacted]
5. Copy the password and use it to **login to the next level**

Fun CLI Shortcuts: You can use the same autocomplete shortcut as before with folder names. Try it with step 2 for this level! You can also use `cd ..` to move back a directory!

COMMAND LINE >_GAMES

Bandit Level 4 → 5

To get started, follow the instructions **here**.
Hint: We need to explore what files we have and learn how to determine which one is a human-readable file. To do this, we want to figure out a command that will tell us what kind of data each of these files contains. There are many ways to do this, but one of the simplest commands involves understanding two separate concepts. Check out these resources:

- *https://linuxize.com/post/linux-file-command/*
- *https://elrey.casa/bash#bashmisclsglob*

STEPS

1. See what files/folders we have
   [redacted]
2. Move into the available directory
   [redacted]
3. Print the files in this directory
   [redacted]
4. Print the files with the type of info the files contain
   [redacted]
5. Print the contents of the only file with human-readable data
   NOTE: Remember how to print contents of files with a dash in the beginning of their name
   [redacted]
6. Copy the password and use it to **login to the next level**

COMMAND LINE
>_GAMES

Bandit Level 5 → 6

To get started, follow the instructions **here**.
*Hint: We want to see the files and their properties within the **inhere** directory, and we need to learn how to tell what properties mean that the file is human-readable, 1033 bytes in size, and not executable.We can use the **man** command to learn more about potential things we can use in our **find** command to specify a file's properties. Check out this resource for how to use the **man** command: https://linuxize.com/post/basic-linux-commands/#the-man-command*

STEPS

1. See what files/folders we have
   [redacted]
2. Move into the available directory
   [redacted]
3. See what files/folders are in this directory
   [redacted]

   NOTE: This is a lot of directories to check, so we need to find an easier way to look for the file based on its properties. This is a good time to use the **man find** command. You can use your □ and □ to scroll through the list, and hit **q** to quit. Make notes for the useful flags and information you find.
4. String together the command and properties to conduct your search
   [redacted]
6. Print the contents of the resulting file
   [redacted]

   NOTE: You can also move into the directory and print the file contents as shown in previous level steps. The command above shows how to specify the path to the file you want to print without needing to be in that same directory.
7. Copy the password and use it to **login to the next level**



Extra Resources

- ## OverTheWire Bandit Walkthrough [Video]

  This video goes through each of the levels, and you can jump to a particular timestamp in the video if you want help on any of the levels 0 - 5.

- ## OverTheWire - Bandit Walkthrough [Guide]

  This guide lists the commands and passwords of each of the levels 0 - 25 and explains the process they took to get them.
  NOTE: There are some easier ways to do some levels and some commands shown in this guide that use things that don't work anymore. The following are some clarifications.

  Level 4 → 5
  [redacted]

  Instead of trying to loop over the files in the current directory, using the ./* tells your shell to apply the command to all files in your current directory. The './' is the part of the command that specifies your current directory, and the * is a special character which says match everything (i.e. all files). More on the glob **here**.

  Level 7 → 8
  [redacted]

  Instead of having to "cat | grep", you can simplify the command to just passing the filename to grep at the end of your pattern you want to match. More on this **here**.

  Level 9 → 10
  (Solution in the guide doesn't work anymore) [redacted]

  For specifically the command, you can check out **this link** for an explanation. Then this is to help explain the Perl regex: **https://regex101.com/r/VhrQ56/1**

  Level 10 → 11
  [redacted]

  Instead of having to "cat | base64" you can just specify the file to be passed in as a redirect. More info on this **here**.