

Hacker Highschool

SECURITY AWARENESS FOR TEENS



LESSON 2

BASIC COMMANDS IN LINUX AND WINDOWS



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Contributors

Daniel Fernández Bleda, Internet Security Auditors

Jairo Hernández, La Salle URL Barcelona

Jaume Abella, La Salle URL Barcelona - ISECOM

Kim Truett, ISECOM

Pete Herzog, ISECOM

Marta Barceló, ISECOM



Universitat Ramon Llull





2.1. Introduction and Objectives

This lesson introduces commands and basic tools for both Windows and Linux operating systems so that you can become familiar with them. These commands will be used to complete the exercises in the following lessons

At the end of this lesson, you should know the following commands:

- General Windows and Linux commands
- Basic network commands and tools
 - ping
 - tracert
 - netstat
 - ipconfig
 - route

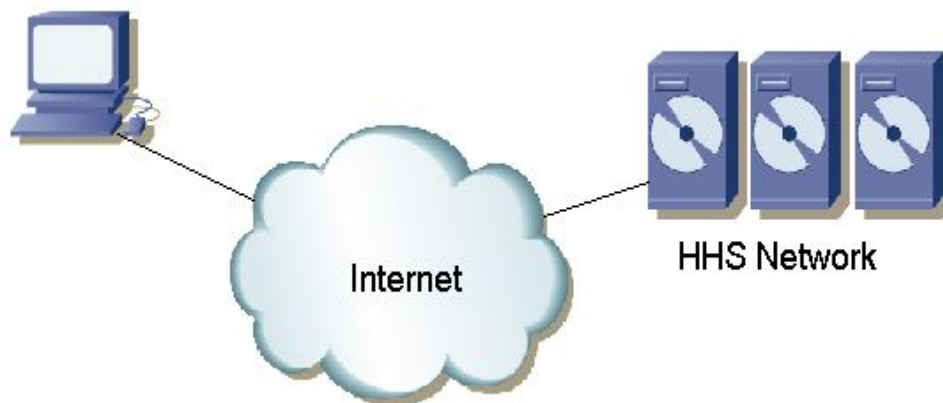
2.2. Requirements and Setup

2.2.1 Requirements

For the lesson, the following are needed:

- a PC with Windows 98/Me/2000/NT/XP/2003
- a PC with Linux Suse/Debian/Knoppix
- access to the Internet.

2.2.2 Setup



This is the setup in which you are going to work. It consists of your PC, with access to the Internet, and the ISECOM Hacker Highschool network, which you will access through the Internet. This is the network against which you will make most of the tests.

Note that access to the ISECOM test network is restricted. In order to gain access to it, your instructor must contact the system administrator, as detailed on the www.hackerhighschool.org web site.



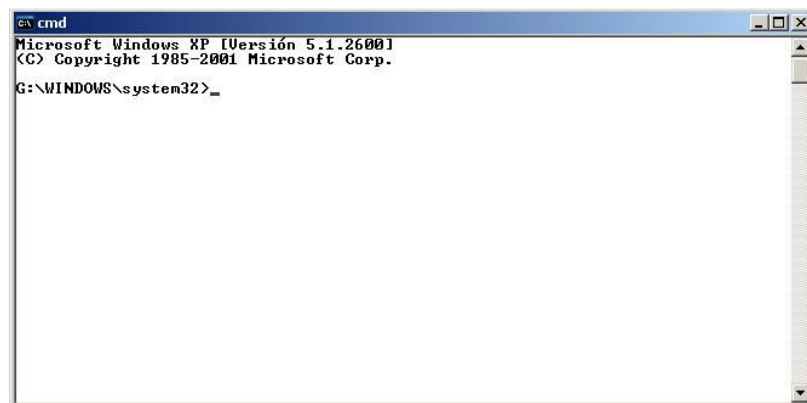
2.3. System Operation: WINDOWS

Most of the tools used for the study of networks are internal commands in the Windows operating system. Therefore, we are going to explain how to open a command window when the Windows operating system is being used.

2.3.1 How to open an MS-DOS window

To issue the following commands, it is necessary to open a command prompt (an MS-DOS window). The procedure for this is the same for all versions of Windows.

- 1.- Click the START button
- 2.- Choose the RUN option
- 3.- Type "**command**" if you are using Windows 95/98 or "**cmd**" for all other versions of Windows and press Enter or click OK.
- 4.- A window similar to the following one will appear:



- 5.- Now the commands and tools listed below can be entered.

2.3.2 Commands and tools (Windows)

Commands

| | |
|----------------------------|--|
| date | Display or set the date of the system |
| time | Display or set the time of the system |
| ver | Display the MS-DOS version that is being used |
| dir | Display the list of subdirectories and files of a directory |
| cls | Clear the screen |
| mkdir, md directory | Make a directory with the name "directory" Example: md tools |
| chdir, cd directory | Display the name or change the current directory to "directory" Example: cd tools |
| rmdir, rd directory | Delete the directory with the name "directory" Example: rd tools |



| | |
|------------------------------------|---|
| tree directory | Display the structure of folders of a path in text-graphic format Example: tree c:\tools |
| chkdsk | Check a disk and show a status report |
| mem | Show the amount of memory used and free in the system |
| rename, ren source dest | Change the name of files Example: ren oldname newname |
| copy source dest | Copy one or more files to another location Example: copy c:\tools\myfile.txt c:\tmp |
| move source dest | Move files and change the name of files and directories Example: move c:\tools c:\tmp |
| type file | Type the content of one or more text files Example: type c:\tools\myfile.txt |
| more file | Display the information screen by screen Example: more c:\tools\myfile.txt |
| delete, del file | Delete one or more files Example: del c:\tools\myfile.txt |

Note: The words in italics are not commands, and must be replaced by the desired values. Some of the commands can be used by typing either their long version or short version; for example, "delete" and "del," are the same command.

Tools

| | |
|------------------|---|
| ping host | <p>Verify contact with the machine "host"</p> <p>The command ping sends "packets" using ICMP (Internet Control Message Protocol) to another computer, to learn whether it is accessible through the network. In addition, it shows a statistical summary about the percentage of packets that have not been answered and the response time. The name of the machine can be used directly or its IP address.</p> <p>Examples: ping www.google.com ping 193.145.85.2</p> <p>Some options are:</p> <ul style="list-style-type: none"> - n N: send N packets - t: ping the specified host until stopped (press CTRL+C to end) <p>To see more options: ping /h</p> |
|------------------|---|



| | |
|---------------------|--|
| tracert host | <p>Show the route that packets follow to reach the machine "host"</p> <p>The command tracert is the abbreviation of trace route, which allows you to learn the route that a packet follows from the origin, (your machine) to the destination machine. It can also tell you the time it takes to make each jump. At the most, 30 jumps will be listed. It is sometimes interesting to observe the names of the machines through which the packets travel.</p> <p>Examples: tracert www.google.com tracert 193.145.85.2</p> <p>Some options are: - h N: to specify N, at the most, jumps. - d: to not show the names of the machines.</p> <p>To see more options: tracert</p> |
| ipconfig | <p>Display information on the active interfaces (ethernet, ppp, etc.) in the computer.</p> <p>Some options: /all: to show more details /renew <i>name</i>: renews connection with "name" when automatic configuration with DHCP is used. /release <i>name</i>: deactivates all matching connections when automatic configuration with DHCP is used.</p> <p>To see more options: ipconfig /?</p> |
| route print | <p>Display the routing table</p> <p>The command route serves to define static routes, to erase routes or simply to see the state of the routes.</p> <p>Some options: print: to show the list of routes. delete: to delete a route. add: to add a route.</p> <p>To see more options: route/?</p> |
| netstat | <p>Displays information on the status of the network and established connections with remote machines.</p> <p>Some options: -a: To sample all the connections and listening ports -n: to display addresses and port numbers in numeric form -e: to sample Ethernet statistics</p> <p>For example: netstat - an</p> <p>To see more options: netstat/?</p> |

For additional information on these commands and tools type "command /h" or "command /?", or "help command" from a MS-DOS window.

For example, for additional information on the tool netstat, we have three possibilities:

- 1) netstat /h
- 2) netstat /?
- 3) help netstat

2.4. System Operations: Linux

Just as in Windows, if you are using Linux, a great majority of the commands that you will use are executed from a console emulation window. Therefore, we will next learn how to open a console window in Linux.



2.4.1 How to open a console window

To issue the following commands, it is necessary to open a console window:

1. - To go to the START APPLICATION button
2. - Select "Run Command"
3. - Enter "konsole"
4. - A window similar to the following one will appear:



5. - Now the commands and tools listed below can be entered.

2.4.2 Commands and tools (Linux)

Commands

| | |
|-----------------|---|
| pwd | Display the name of the current directory. |
| hostname | Display the name of the local host (the computer which you are currently using) |

| | |
|------------------------------|---|
| finger user | Display information on the user "user" Example: finger root |
| ls | List the content of the directories Example: ls -la |
| cd directory | Change from current directory to "directory". If no directory name is specified it changes to the home directory, Example: For the login name "mylogin" the command \$cd changes the directory to /home/mylogin Example: \$cd - changes to the last visited directory Example: \$cd /tmp changes to the "tmp" directory |
| cp source dest | Copy files. Copy the file "source" to the file "dest". Example: cp /etc/passwd /tmp |
| rm file | Delete files. Only the owner of the file (or root) can delete it. Example: rm myfile |
| mv source dest | Move or rename files and directories. Example: mv oldname newname |
| mkdir directory | Make a directory with the name "directory". Example: mkdir tools |
| rmdir directory | Delete the directory with the name "directory" if it is empty. Example: rmdir tools |
| find / -name file | Find a file with the name "file" beginning the search in the root directory Example: find / -name myfile |
| echo string | Write the string "string" in the standard output Example: echo hello |
| command > file | Redirect the normal screen output of the command "command" to the file "file" Example: ls > myls |
| command >> file | Redirect the normal screen output of the command "command" to the file "file". If the file already exists, it appends the output to the end of the file. Example: ls >> myls |
| man command | Show the pages of the online manual about "command" Example: man ls |

Note: The words in italics are not commands and must be replaced by the desired values.



For additional information on the use of these commands and tools, type in "command -help" or "man command" in the console window.

For example, for additional information on the "ls" command, type in either of these two possibilities:

- 1) ls --help
- 2) man ls

Tools_(Please see the Windows section for details on these tools.)

| | |
|---------------------|---|
| ping host | Verify the contact with the machine "host" Example: ping www.google.com |
| tracert host | Show the route that the packets follow to reach the machine "host". Example: tracert www.google.com |
| ifconfig | Display information on the active interfaces (ethernet, ppp, etc.) |
| route | Display the routing table |
| netstat | Display information on the status of the network Example: netstat -an |

Basic command equivalences for Windows/Linux

This is a table showing the basic command equivalences between Linux and Windows. Commands are executed from a shell (in Linux) or from a MS-DOS window (in Windows).

| Linux | Windows |
|-----------------|------------------------|
| command --help | command /h, command /? |
| man command | help command |
| cp | copy |
| rm | del |
| mv | move |
| mv | ren |
| more, less, cat | type |
| lpr | print |
| rm -R | deltree |
| ls | dir |
| cd | cd |
| mkdir | md |
| rmdir | rd |
| route | route print |
| tracert -l | tracert |
| ping | ping |
| ifconfig | ipconfig |



2.5. Exercises

2.5.1 Exercises in Windows

1. Go to a MS-DOS window.
2. Identify the version of MS-DOS that you are using. What version have you detected? What command have you used?
3. Identify the date and time of the system. If they are incorrect, modify them so that they are correct. What command have you used?
4. Identify all the directories and files that are in "c:\". What command have you used?
5. Create the directory c:\hhs\lesson0. Copy in this directory all the files with the extension ".sys" that are in "c:\". What files have you found? What commands have you used?
6. Identify the IP address of your host. What command have you used? What IP address do you have?
7. Trace the route to "www.google.com". Identify IPs of the intermediate routers.

2.5.2 Exercises in Linux



1. Identify the owner of the file "passwd". (Note: first locate where this file is). What command have you used?
2. Create the directory "work" in your own home directory (for example, if your login is "mylogin", create the directory in "/home/mylogin"), and copy the file "passwd" in the directory "work" that you have just created. Identify the owner of the file "passwd" that has been copied.
3. Create the directory ".hide" in the "work" directory. List the contents of this directory. What did you have to do to see the contents of directory ".hide"?
4. Create the file "test1" with the content "This is the content of the file test1" in the "work" directory. Create the file "test2" with the content "This is the content of the file test2" in the "work" directory. Copy into a file with the name "test" the contents of previous files. What commands have you used?
5. Identify the name and the IP address of your machine. What commands have you used? What IP address do you have?
6. Trace the route to "www.google.com". Identify IPs of the intermediate routers.

2.5.3 Exercise 3

Complete the following table with parallelisms between Windows and Linux. For example: the Linux command "command -help" is equivalent to the Windows



command "command /h". As another example, in Linux: "cp" is just like the Windows command, "copy".

|  |  |
|---|--|
| command -- | command / |
| help | h |
| cp | copy |
| | del |
| mv | |
| more | |
| | print |
| | deltree |
| ls | |
| cd | |
| | md |
| | rd |
| route | |
| | tracert |
| Ping | |
| | ipconfig |



Further Reading

For an extensive glossary of terms visit the following URLs:

<http://www.matisse.net/files/glossary.html>

<http://www.uic.edu/depts/accc/inform/v106.html>

<http://www.catb.org/~esr/jargon/>

Windows – for additional information on commands and tools, type in "command /h" or "command /?", or "help command" from a MS-DOS window.

Linux – for additional information on commands and tools, type in "command --help" or "man command" from a shell.