Module 08
System Hacking
Windows Hacking

Windows Hacking

Windows hacking, a subset of System hacking, is the science of testing computers and networks for vulnerabilities and plug-ins.

ICON KEY


Important Information

Quiz


CPTE Labs


Course Review

Lab Objectives

The objective of this lab is to help students learn to monitor a system remotely and to extract hidden files and other tasks that include:

- Password cracking
- Password attacks
- Identifying various password cracking tools
- Formulating countermeasures for password cracking
- Escalating privileges
- Executing applications
- Keyloggers and Spywares
- Spyware and keylogger countermeasures
- Hiding files and extracting hidden files
- Understanding rootkits
- The use of Steganography
- Covering tracks
- Monitoring a system remotely

Lab Scenario

Password hacking is one of the easiest and most common ways hackers obtain unauthorized computer or network access. Although strong passwords that are difficult to crack (or guess) are easy to create and maintain, users often neglect this.

Therefore, passwords are one of the weakest links in the information security chain.

Passwords rely on secrecy. After a password is compromised, its original owner isn't the only person who can access the system with it. Hackers have many ways to obtain passwords. Hackers can obtain passwords from local computers by using password-cracking software. To obtain passwords from across a network, hackers can use remote cracking utilities or network analyzers. This lab demonstrates just how easily hackers can gather password information from your network and describes password vulnerabilities that exist in computer networks along with countermeasures to help prevent these vulnerabilities from being exploited on your systems.

Lab Environment

This lab requires:

- A computer running Windows 7 as host machine
- Windows Server 2008 running in virtual machine as guest machine
- A web browser with Internet access

Lab Duration

Time: 100 Minutes

Overview of Windows Hacking

The goal of system hacking is to gain access, escalate privileges, execute applications, and hide files.

Lab Tasks

Recommended labs to assist you in Windows Hacking:

- **Lab 1: User System Monitoring and Surveillance Needs Using Spytech SpyAgent**
- **Lab 2: Hiding Files Using NTFS Streams**
- **Lab 3: Find Hidden Files Using ADS Spy**
- **Lab 4: Hiding Files Using the Stealth Files Tool**
- **Lab 5: Extracting SAM Hashes Using PWdump7 Tool**
- **Lab 6: Creating the Rainbow Tables Using Winrtge**
- **Lab 7: Password Cracking Using RainbowCrack**

System Monitoring and Surveillance Needs Using Spytech SpyAgent

Lab 1

ICON KEY

Important Information

Quiz

CPTE Labs

Course Review

Spytech SpyAgent Overview

Spytech SpyAgent is a powerful computer spy software that allows you to monitor everything users do on your computer, in total stealth. SpyAgent provides a large array of essential computer monitoring features, as well as website, application, and chat client blocking, lockdown scheduling, and remote delivery of logs via email or FTP.

SpyAgent also features powerful filtering and access control features, such as Chat Blocking (to restrict access to chat software), Application Blocking (to prevent specific applications from being executed), and Website Filtering.

Lab Scenario

Today, employees are given access to computer, telephone, and other electronic communication equipment. Email, instant messaging, global positioning systems, telephone systems, and video cameras have given employers new ways to monitor the conduct and performance of their employees. Many employees also are given laptop computer and wireless phones they can take home and use for business outside the workplace.

Whether an employee can claim a reasonable expectation of privacy when using such company-supplied equipment, in large part, depends upon the steps the employer has made to minimize that expectation.

The objective of this lab is to help students use Spytech and the SpyAgent tool.

After completing this lab, students will be able to:

- Install and configure Spytech SpyAgent
- Monitor keystrokes typed, websites visited, and Internet Traffic Data

Lab Resources

To run this lab, you will need the following:

- SpyTech SpyAgent located at Desktop
- Run this tool on Windows 7
- Administrative privileges to run tools

Lab Duration

Time: 15 Minutes

Lab Tasks

Task 1

Installation of Spytech SpyAgent

You can download the spytech SpyAgent from *http://www.spytech-web.com/*

1. Navigate to Desktop
2. Double-click **SpyTechSetup.exe**. You will see the following window. Click **Next**.

Figure 1.1 – Installation of Spytech SpyAgent

3. The **Welcome** wizard of the Spytech SpyAgent program appears; read the instructions and click **Next.**

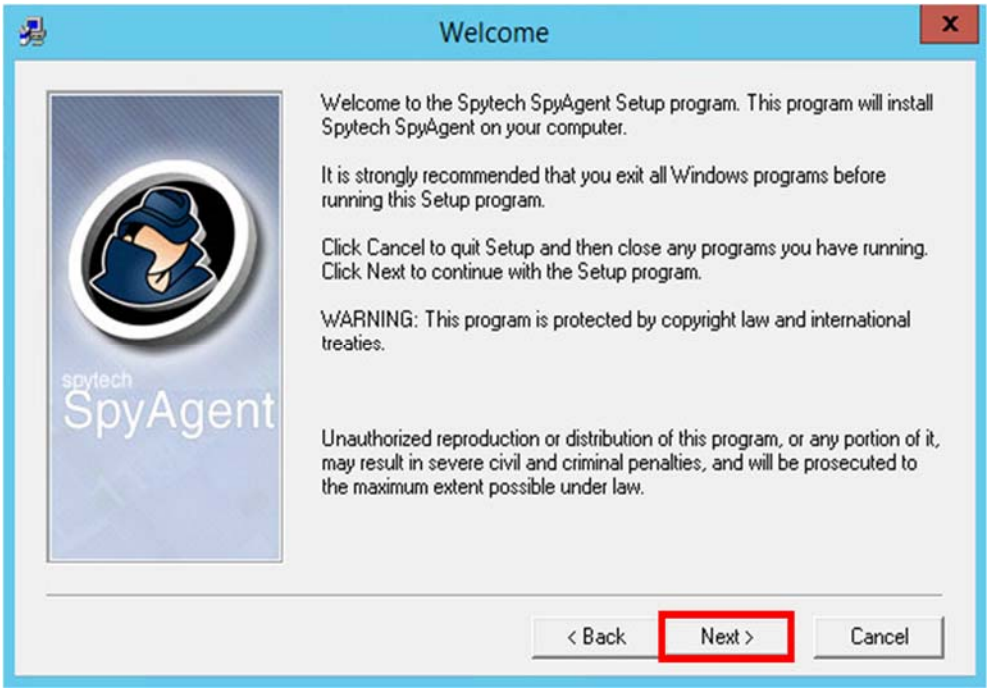

Figure 1.2 – Installation wizard of Spytech SpyAgent

Active Mode: This option allows SpyAgent to be started in monitoring mode when it is opened -no need for manually starting its monitoring

4. The **Important Notes** window appears. Read the note and click **Next**.

Figure 1.3 – Installation wizard

5. The **Software License Agreement** window appears; you must accept the agreement to install Spytech SpyAgent.
6. Click **Yes** to continue.

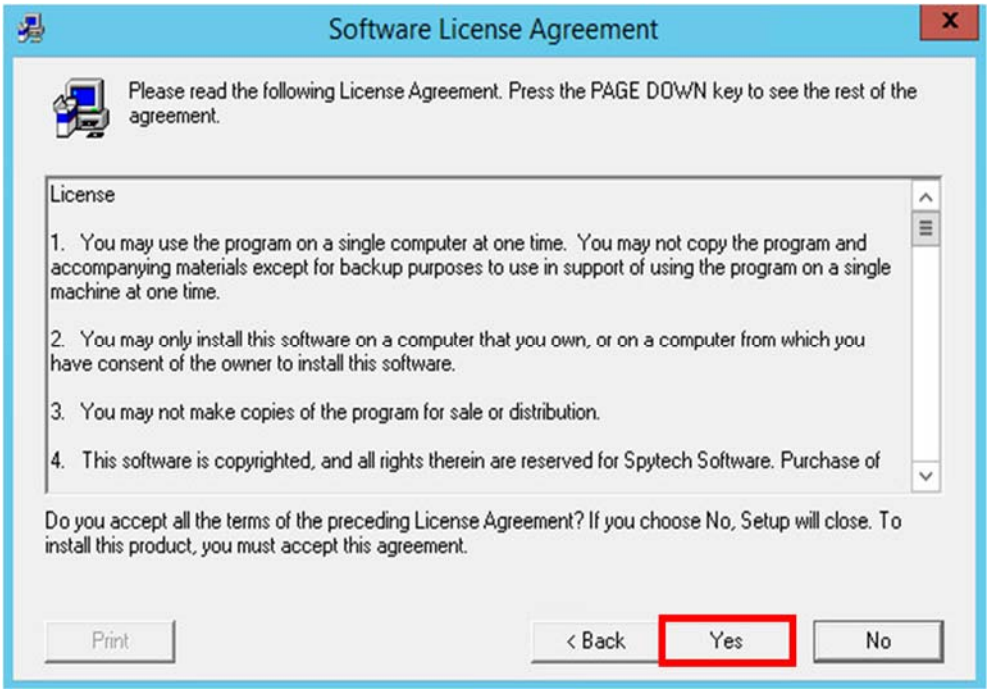

Figure 1.4 – Select the Agreement

Stealth Mode: This option allows SpyAgent to run in total stealth. Combined with 'Active Mode' the software will load and run in monitoring mode in complete stealth.

7. Choose the **Destination Location** to install Spytech SpyAgent.
8. Click **Next** to continue installation.

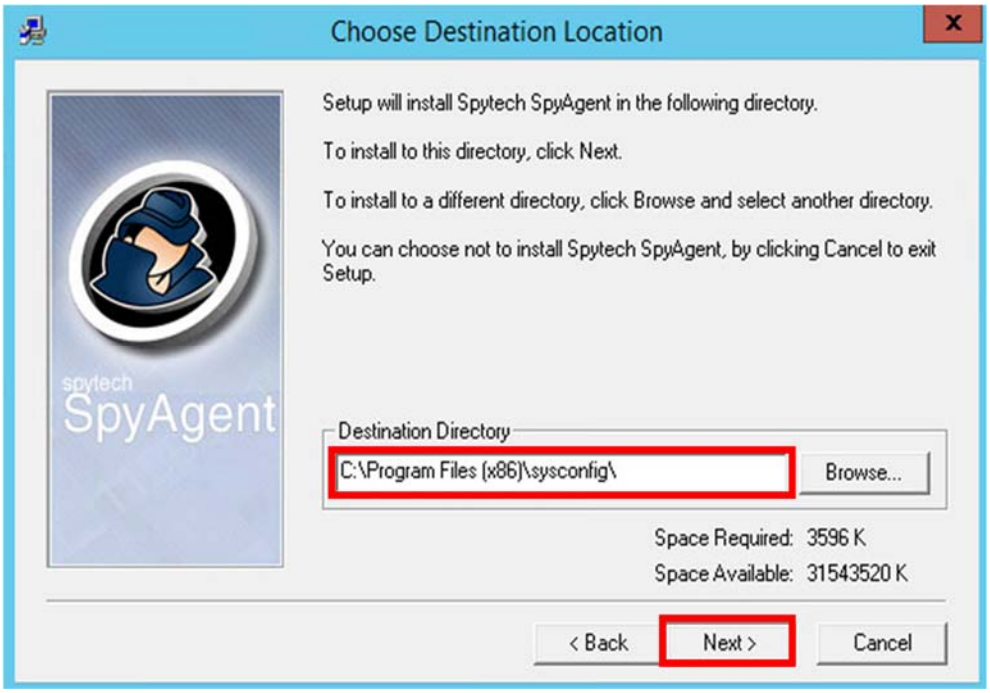

Figure 1.5 – Selecting folder for installation

9. Select SpyAgent installation type, and select **Administrator/Tester** as the setup type.
10. Click **Next**.

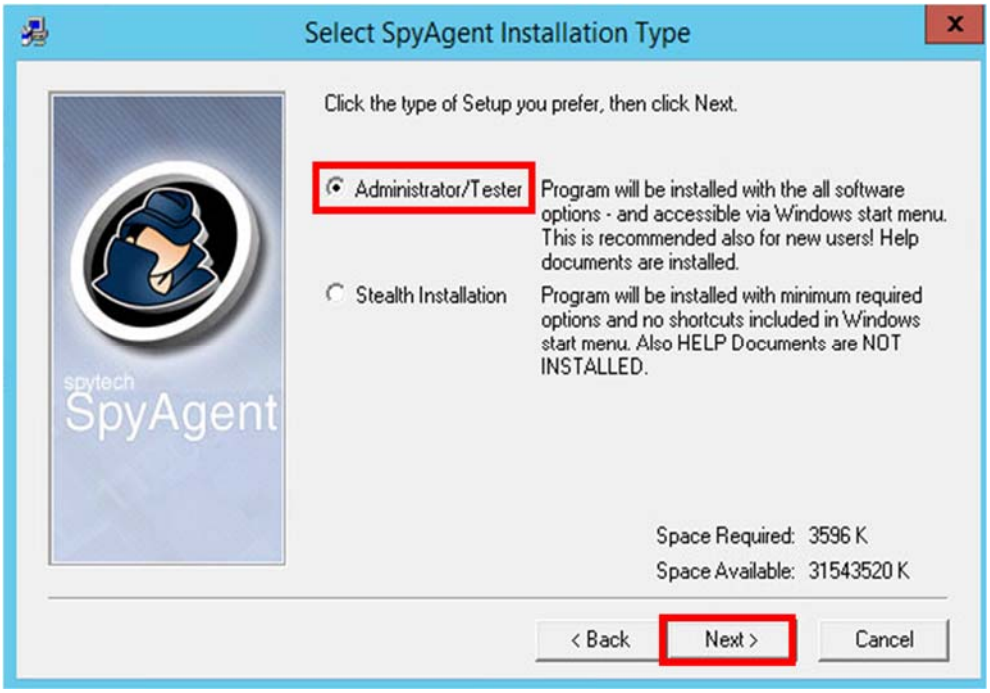

Figure 1.6 – Selecting installation type

11. The **Ready to Install** window appears. Click **Next** to start installing Spytech SpyAgent.

Log Location: This allows you to specify where you want SpyAgent to store its activity logs. For Windows NT/2000/XP systems monitoring, for ALL users it is recommended that the log location be set to x:\documents and settings\all users

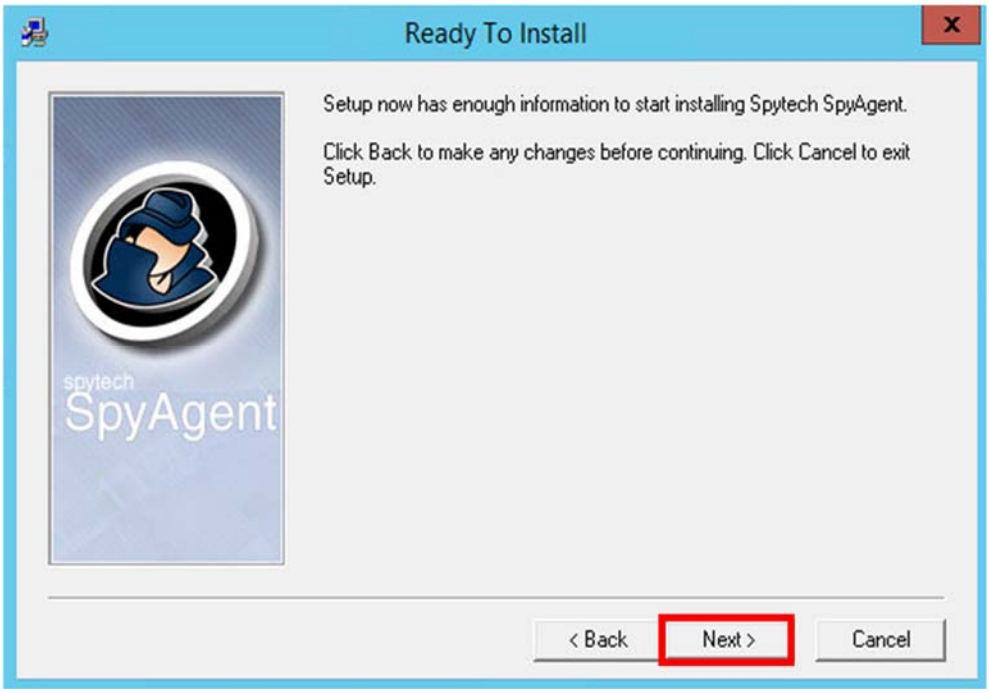

Figure 1.7 – Ready to Install window

12. The prompt will ask: *Would you like to include an uninstaller*? Click **Yes**.

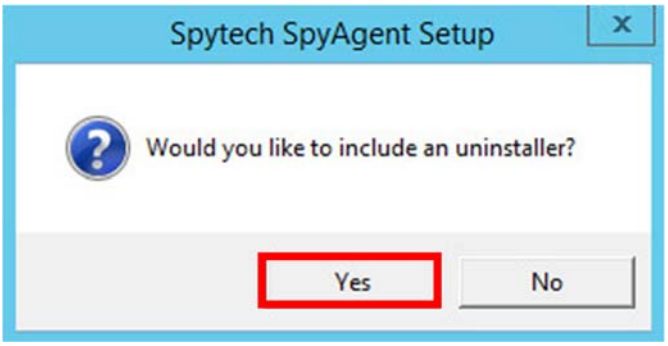

Figure 1.8 – Selecting an uninstaller

13. A **Notice for Antivirus Users** window appears; read the text, click **Next**.

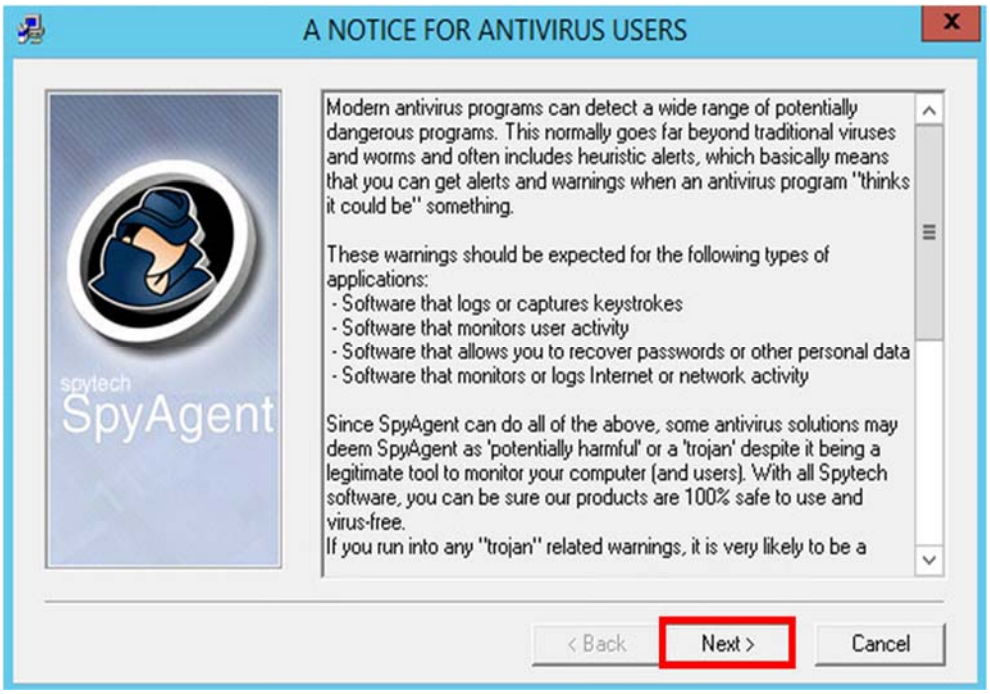

Figure 1.9 – Accept Antivirus notice

14.The **Finished** window appears. Click **Close** to end the setup.

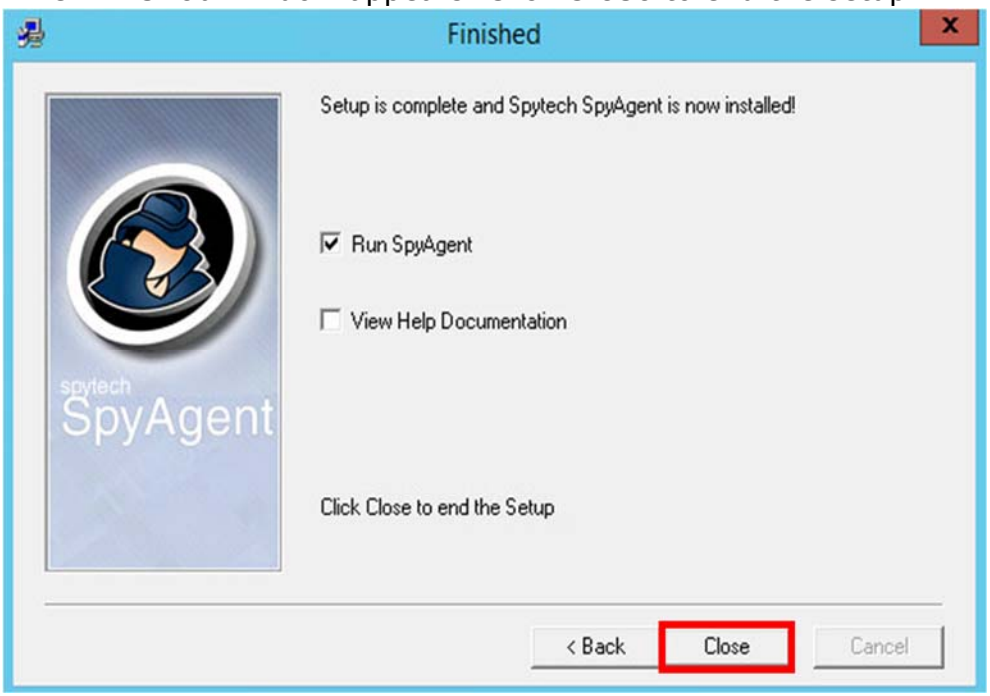

Figure 1.10 – Accept Antivirus notice

15.The following window appears. Click **continue**.

Figure 1.11 – Ordering Info SpyAgent window

Figure 1.12 – Welcome SpyAgent window – Step 1

16. The following window appears. Enter the password in **New Password** field, and retype the same password in **Confirm** field.
17. Click **OK**.

Figure 1.13 – Selecting New Password

18. The following window appears. Click **click to continue**

Figure 1.14 – Welcome SpyAgent window – Step 2

19. Configuration package wizard appears. Select the **Complete + Stealth Configuration** package.
20. Click **Next**.

Figure 1.15 – Selecting configuration package

21. Choose additional options, and select the **Display Alert on Startup** check box.
22. Click **Next**.

Figure 1.16 – Selecting additional option

Internet Traffic Data: This logs ALL incoming and outgoing internet data transmitted and received by users. All email passwords, FTP passwords, website transmissions, etc. will be logged by this feature

23.The **Confirm Settings** wizard appears. To continue click **Next**.

Figure 1.17 – Confirm setting wizard

SpyAgent has the unique ability to allow you to have its activity logs delivered to your personal e-mail address or FTP account

24. The **Configurations Applied** window appears. Click **Next**.

Figure 1.18 –Configuration applied window

25. The **Configuration Finished** window appears. Click **Finish** to successfully set up SpyAgent.

Figure 1.19 –Configuration finished window

SpyAgent has a built in scheduling feature that allows you to configure SpyAgent to log user activities during specific hours of the day, or to lock down your computer at certain times.

26. The main window of Spytech SpyAgent appears, as shown in the following figure. Click **Click to continue...**
27. To check the general user activities, click **Start Monitoring**.

Task 2

Monitoring User Activities

SpyAgent has a feature called SmartLogging that lets you trigger monitoring when certain events arise, instead of constantly logging everything that users do.
SmartLogging ties into the keystrokes, websites visited, applications ran, and windows used logging functions.

Figure 1.18 – Start Monitoring

28. When the **Enter Access Password** window appears, enter the **password**.
29. Click **OK**.
30. When the Stealth Notice window appears, read the instructions, click **OK**
    NOTE: To bring SpyAgent out of stealth mode, press **CONTROL+SHIFT+ALT+M** on your keyboard.
31. To check user keystrokes from the keyboard, click **Keyboard & Mouse,** then **View Keystrokes log**.
32. It will show all the resulting keystrokes as shown in the following screenshot.

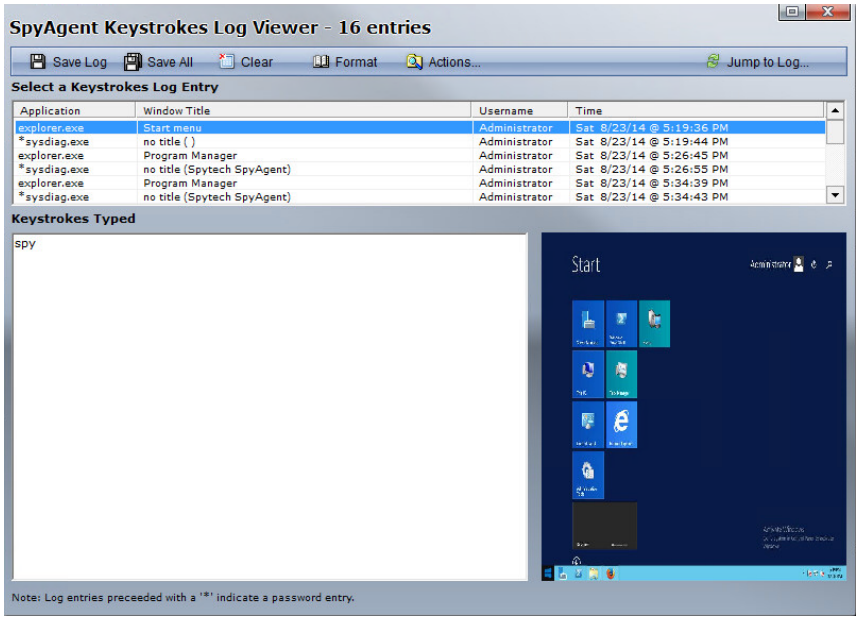

Figure 1.19 – Resulted Keystorkes

33. To check the websites visited by the user, click **Website Usage,** then click **View Websites logged.**
34. It will show all the user visited website results, as shown in the following screenshot.

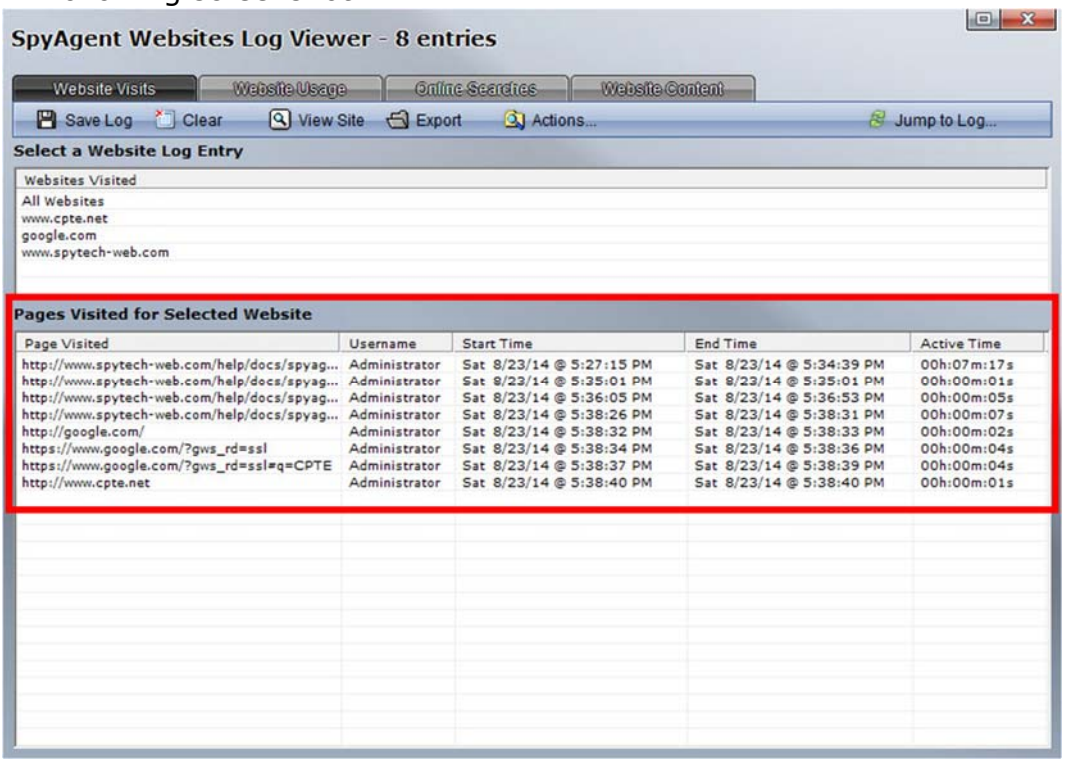

Figure 1.19 – Resulted of visited websites

SpyAgent features a large set of reporting tools that allow you to save and prepare log data for later viewing, documentation, and printing. All reports are formatted in HTML for viewing with your web browser.

Lab Analysis

Analyze and document the results related to the lab exercise. Give your opinion on your target's security posture and exposure.

Tool / Utility	Information Collected / Objectives Achieved
Spytech SpyAgent	Output: • Monitoring keystrokes typed • Website log entries • Pages visited for selected website • Internet traffic data

Hiding Files Using NTFS Streams

Lab 2

NTFS Streams Overview

Alternate Data Streams (ADS) have been around since the introduction of windows NTFS. They were designed to provide compatibility with the old Hierarchical File System (HFS) from Mac which uses something called resource forks. [http://www.securityfocus.com/infocus/1822, http://en.wikipedia.org/wiki/Alternate_Data_Streams]
Access these sites outside of the lab environment for more information.
Basically, ADS can be used to hide the presence of a secret or malicious file inside the file record of an innocent file. That is, when Windows shows you a file, say "readme.txt", the metadata that tells your system where to get "readme.txt" may also contain information for "EvilSpyware.exe". Thus, malicious files may be on your system and you cannot see them using normal means.

Lab Scenario

Once the hacker has fully hacked the local system, installed their backdoors and port redirectors, and obtained all the information available to them, they will proceed to hack other systems on the network. Most often there are matching service, administrator, or support accounts residing on each system that make it easy for the attacker to compromise each system in a short amount of time. As each new system is hacked, the attacker performs the steps outlined above to gather additional system and password information. Attackers continue to leverage information on each system until they identify passwords for accounts that reside on highly prized systems including payroll, root domain controllers, and web servers. In order to be an expert ethical hacker and penetration tester, you must understand how to hide files using NTFS streams.

The objective of this lab is to help students learn how to hide files using NTFS streams.
It will teach you how to:

- Use NTFS streams
- Hide files

Lab Resources

To run this lab, you will need the following:

- A computer running on Windows 7 Virtual Machine
- NTFS drive
- Administrative privileges to run tools

Lab Duration

Time: 15 Minutes

Lab Tasks

Task 1

NTFS Stereams

1. Run this lab in a Windows 7 virtual machine
2. Create a folder called **cpte** on the **C:** drive and copy **calc.exe** from C:\windows\system32 to C:\cpte.
3. Open a command prompt and go to C:\cpte and type **notepad readme.txt** in the command prompt and press **Enter**.
4. **readme.txt** in Notepad appears. (Click the Yes button if prompted to create a new readme.txt file.)
5. Type **Hello World!** and **Save** the file.

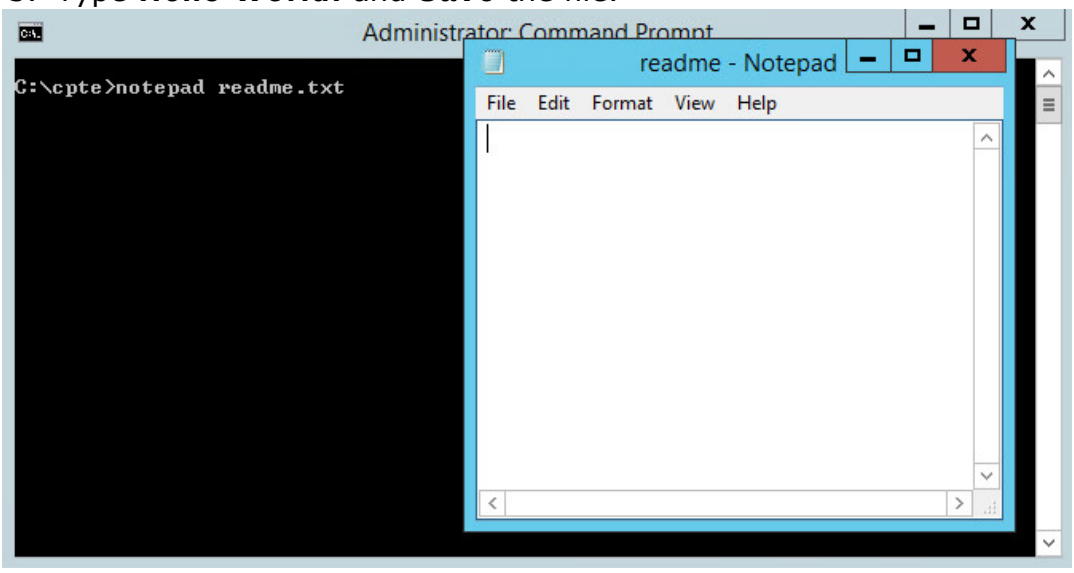

Figure 3.1 – Command prompt with "notepad readme.txt"

6. Note the file **size** of the **readme.txt** by typing **dir** in the command prompt.
7. Now hide **calc.exe** inside the **readme.txt** by typing the following in the command prompt:

```
type c:\cpte\calc.exe > c:\cpte\readme.txt:calc.exe
```

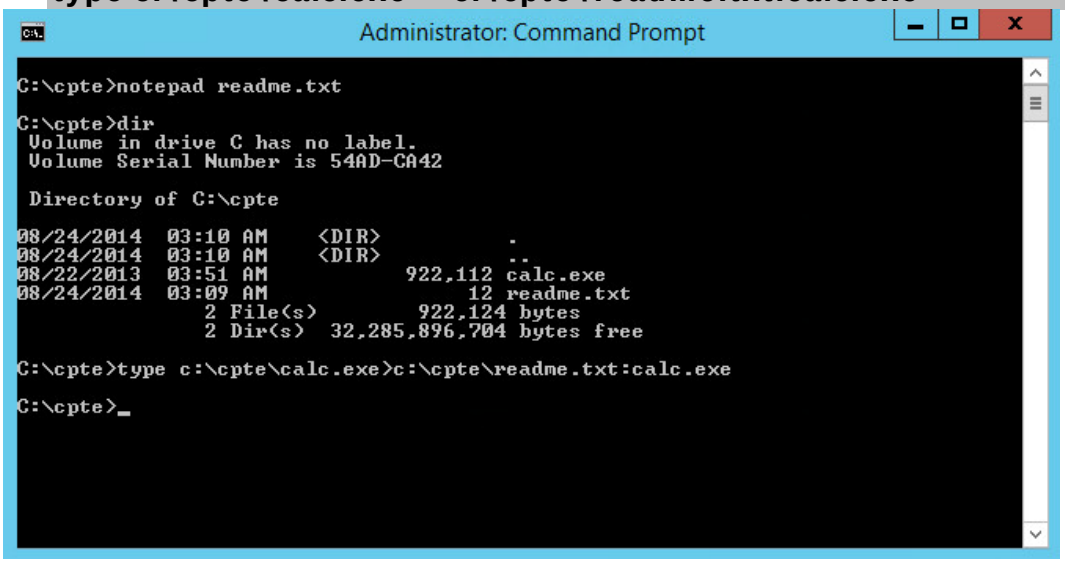

Figure 3.2 – Command prompt with hiding calc.exe

NTFS (New Technology File System) is the standard file system of Windows.

A stream consists of data associated with a main file or directory (known as the main unnamed stream).

8. Type **dir** in the command prompt and note the tile size of **readme.txt**.

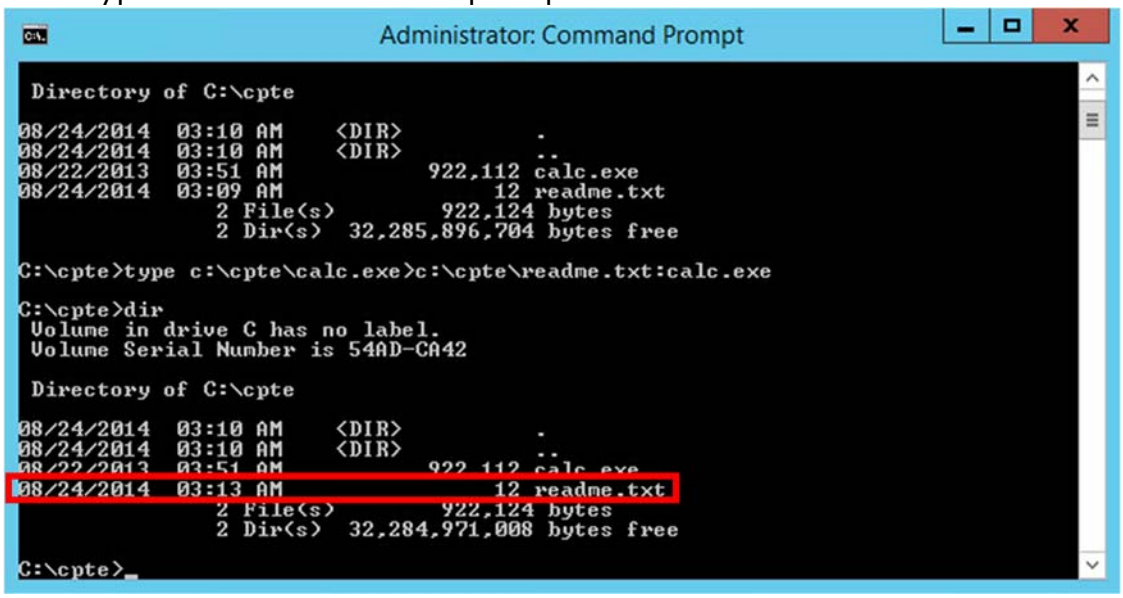

Figure 3.3 – Command prompt with executing hidden calc.exe command

NTFS (New Technology File System) is the standard file system of Windows.

NTFS supersedes the FAT file system as the preferred file system for Microsoft's Windows operating systems.

9. The file **size** of the **readme.txt should not change**. Now navigate to the directory **c:\cpte** and **delete calc.exe**.
10. Return to the command prompt and type command:

mklink backdoor.exe readme.txt:calc.exe and press Enter

Note: outside of this lab environment you would now be able to type backdoor.exe to open calculator. Unfortunately this part doesn't work in the virtual environment.

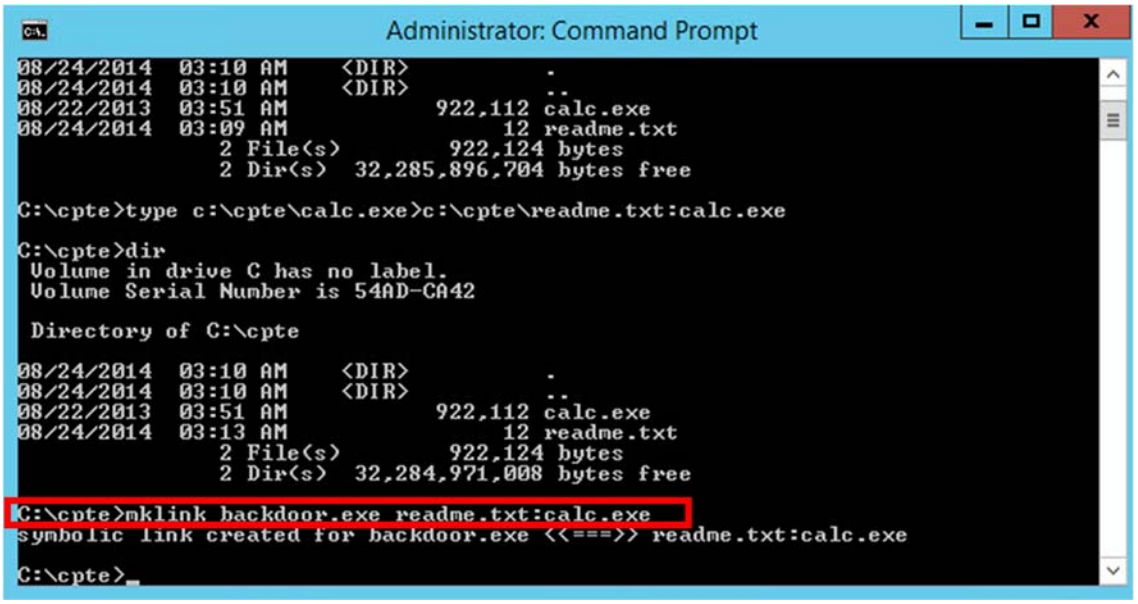

Figure 3.4 – Command prompt linking the hidden calc.exe

A stream is a hidden file that is linked to a normal (visible) file.

If the mklink fails, another option is:

start .\readme.txt:calc.exe *or* ***start \cpte\readme.txt:calc.exe***

FYI, typing in ***backdoor.exe*** *starts the calc.exe program on physical devices yet this typically fails on virtual machine systems.*

Lab Analysis

Document all the results discovered during the lab.

Tool / Utility	Information Collected / Objectives Achieved
NTFS Streams	**Output:** Calculator (calc.exe) file executed

Quiz

1. Evaluate alternative methods to hide the other exe files (like calc.exe).
2. Does ADS (Alternate Data Streams) lose hidden streams when copied across the network?
3. Can *Nix handle NTFS ADS data streams?
4. Enumerate Alternate Data Streams with LADS tool.

Lab 3

Find Hidden Files Using ADS Spy

ADS Spy Overview

ADS Spy: A small tool to list, view or delete Alternate Data Streams (ADS) on Windows systems with NTFS file systems. ADS are a way of storing meta-information about files, without actually storing the information in the file it belongs to, carried over from early MacOS compatibility from Windows NT4. This meta-information is not visible in Windows Explorer.
Recently, browser hijackers began using this technique to store hidden information on the system, and even store Trojan executable files in ADS streams of random files on the system. Use with caution, Windows and several antivirus programs also store (temporary) information in ADS.

ICON KEY


Important Information

Quiz


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Course Review

Lab Scenario

Hackers have many ways to obtain passwords. Hackers can obtain passwords from local computers by using password-cracking software. To obtain passwords from across a network, hackers can use remote cracking utilities or network analyzers. This chapter demonstrates just how easily hackers can gather password information from your network and describes password vulnerabilities that exist in computer networks and countermeasures to help prevent these vulnerabilities from being exploited on your systems. In order to be an expert penetration tester, you must understand how to find hidden files using ADS Spy.

The objective of this lab is to help students learn how to list, view, or delete Alternate Data Streams and how to use them.

It will teach you how to:

- Use ADS Spy
- Find hidden files

Lab Resources

To run this lab, you need the following:

- ADS Spy is located at Desktop
- Run this tool in Windows 7

Lab Duration

Time: 10 Minutes

Lab Tasks

1. Double-click and launch **ADS Spy** from Desktop.

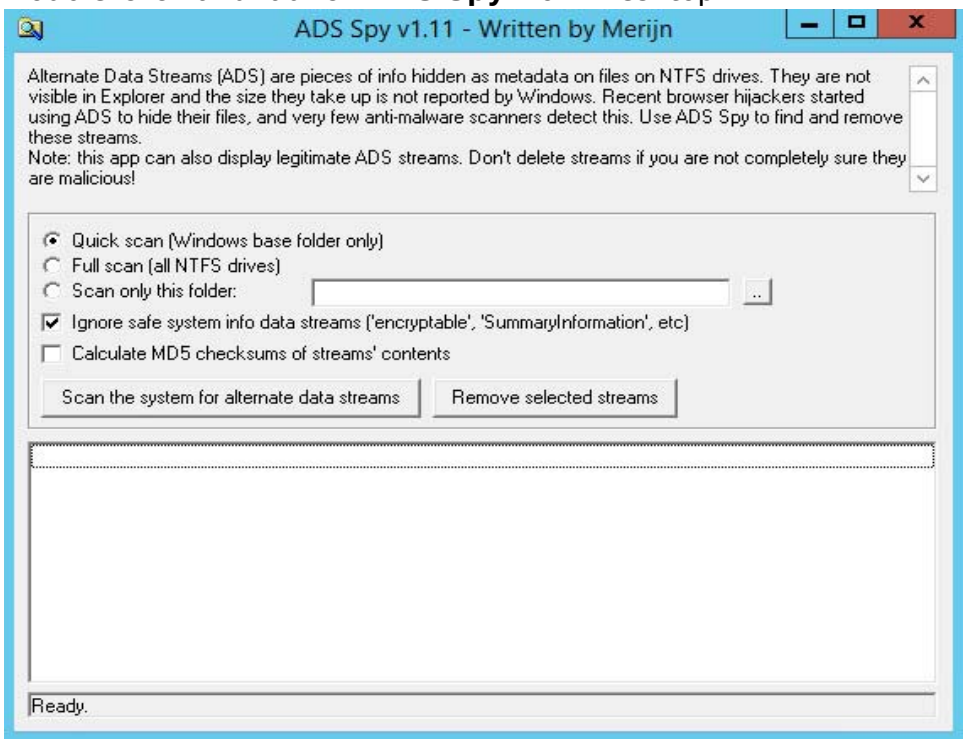
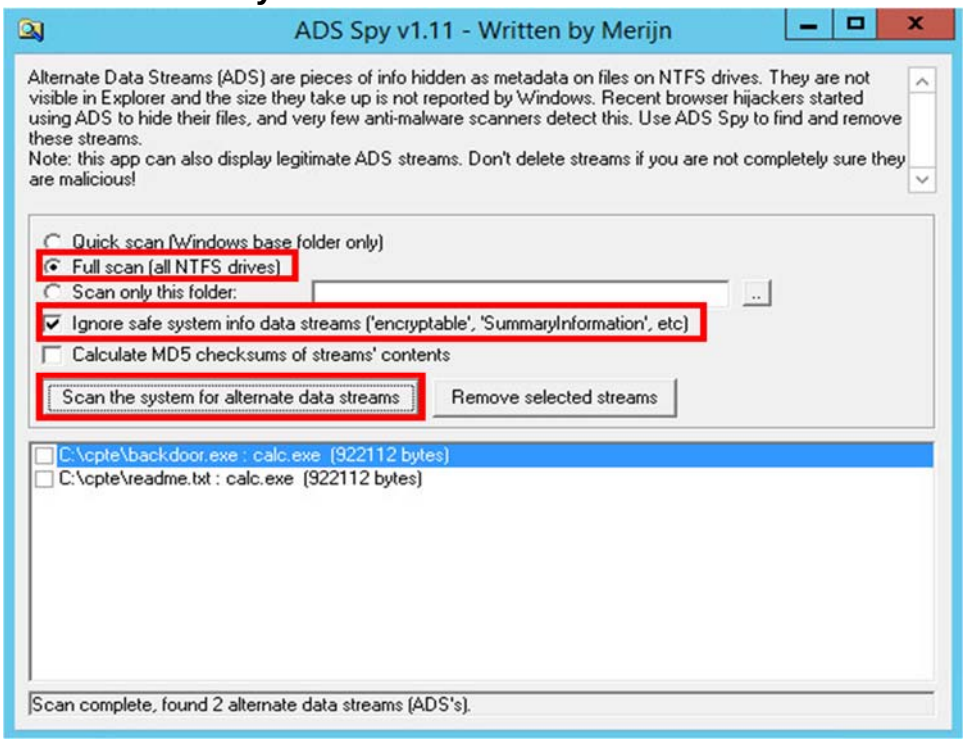


Figure: 4.1- Welcome screen of ADS Spy

2. Start an **appropriate scan**.
3. Click **Scan the system for alternate data streams**.



Task 1

Alternative Data Streams

ADS Spy is a small tool to list, view, or delete Alternate Data Streams (ADS) on Windows Operating Systems with NTFS file systems.

ADS are a way of storing meta-information regarding files, without actually storing the information in the file it belongs to, carried over from early MacOS compatibility

4. Find the **ADS hidden info file** while you scan the system for alternative data streams
5. To remove the Alternate Data Streams, click **Remove Selected streams**

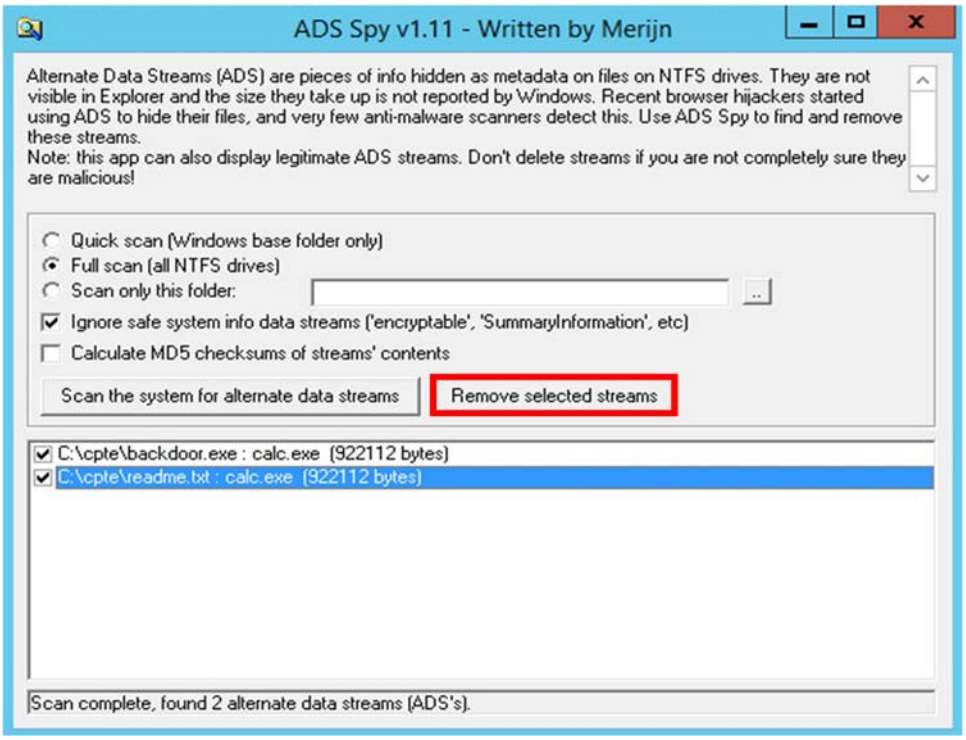


Figure: 4.3- Find the hidden streams file

Lab Analysis

Document all the results discovered during the lab.

Tool / Utility	Information Collected / Objectives Achieved
ADS Spy	**Scan Option:** Full Scan (all NTFS drives) **Output:** • Hidden files with its location • Hidden files size

Quiz

1. Analyze how ADS Spy detects NTFS streams.

Lab 4

Hiding Files Using the Stealth Files Tool

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Important Information

Quiz


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Course Review

Stealth Files Overview

Stealth Files: Stealth Files hides any type of file in almost any other type of file. This is called steganography. This is a way of encrypting data so that it is hard to find. You can not decrypt something unless you know what to decrypt. Using steganography, Stealth Files compresses, encrypts, and then hides any type of file inside many other types of files, including EXE, DLL, OCX, COM, JPG, GIF, ART, MP3, AVI, WAV, DOC, BMP, and most other types of video, image, and executable files. You will still be able to view, open, and run these files without any problems. If you want to, you can also use a password to encrypt the hidden files.

Lab Scenario

The Windows NT NTFS file system has a feature that is not well documented and is unknown to many NT developers and most users. A stream is a hidden file that is linked to a normal (visible) file. A stream is not limited in size and there can be more than one stream linked to a normal file. Streams can have any name that complies with NTFS naming conventions. In order to be a penetration tester engineer, you must understand how to hide files using the Stealth Files tool. In this lab, discuss how to find hidden files inside of other files using the Stealth Files Tool.

The objective of this lab is to teach students how to hide files using the Stealth Files tool.

It will teach you how to:

- Use the Stealth Files Tool
- Hide files

Lab Resources

To run this lab, you need the following:

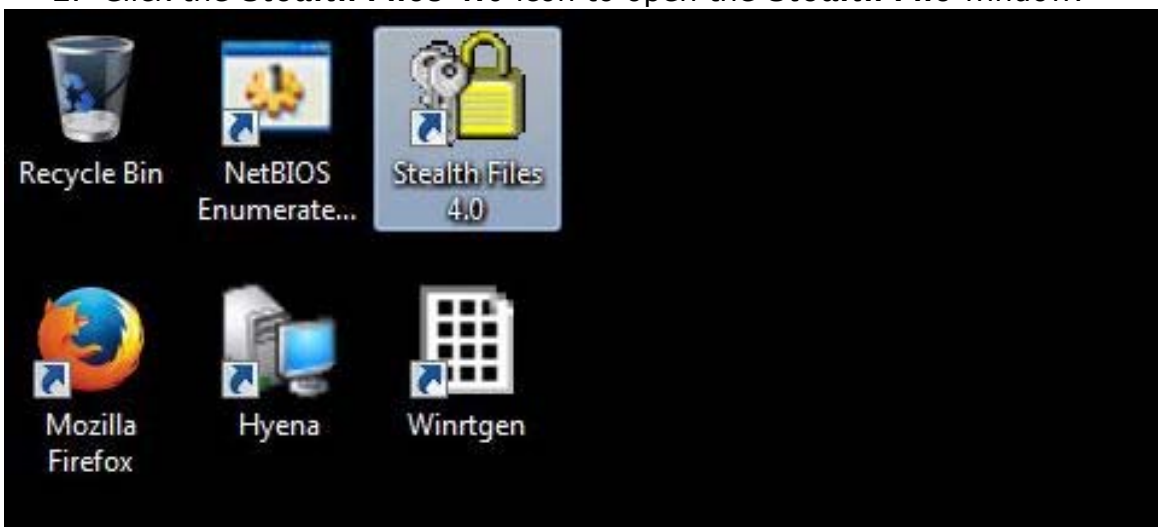
- Stealth files tool located on Desktop
- Run this tool in Windows 7
- Administrative privileges to run the **Stealth files tool**

Lab Duration

Time: 15 Minutes

Lab Tasks

1. Navigate to Desktop
2. Click the **Stealth Files 4.0** icon to open the **Stealth File** window.



Task 1

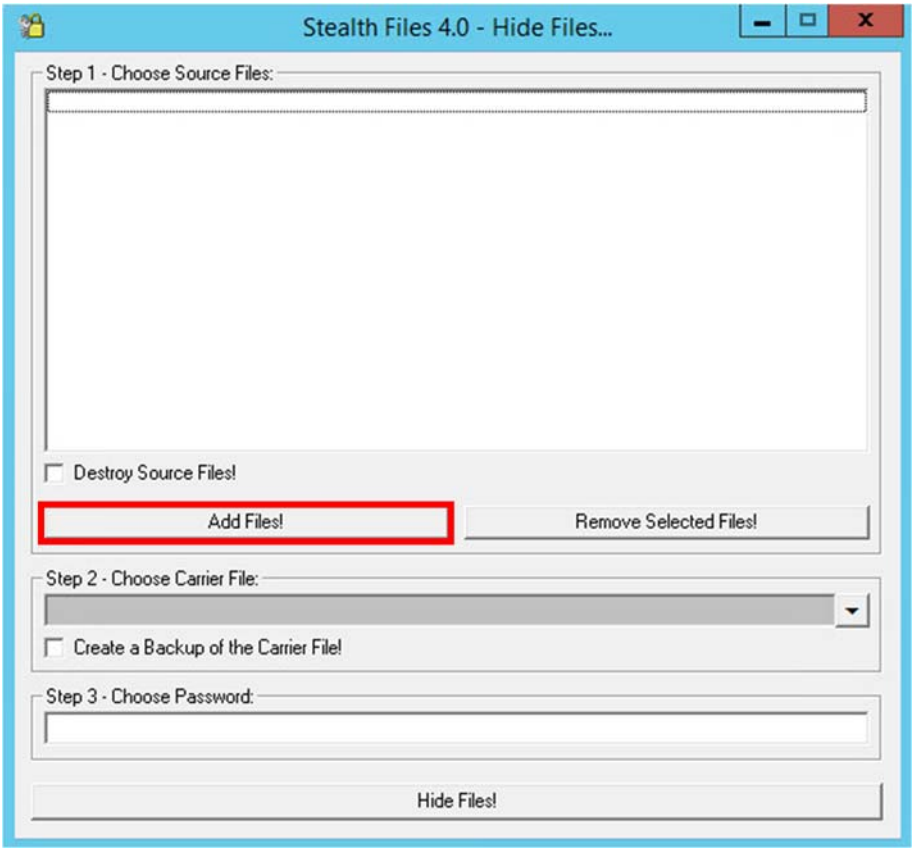
Steganography

Steganography is the art and science of writing hidden messages

3. The main window of **Stealth Files 4.0** is shown in the following figure.

4. Click **Hide Files** to start the process of hiding the files.
5. Click **Add files.**

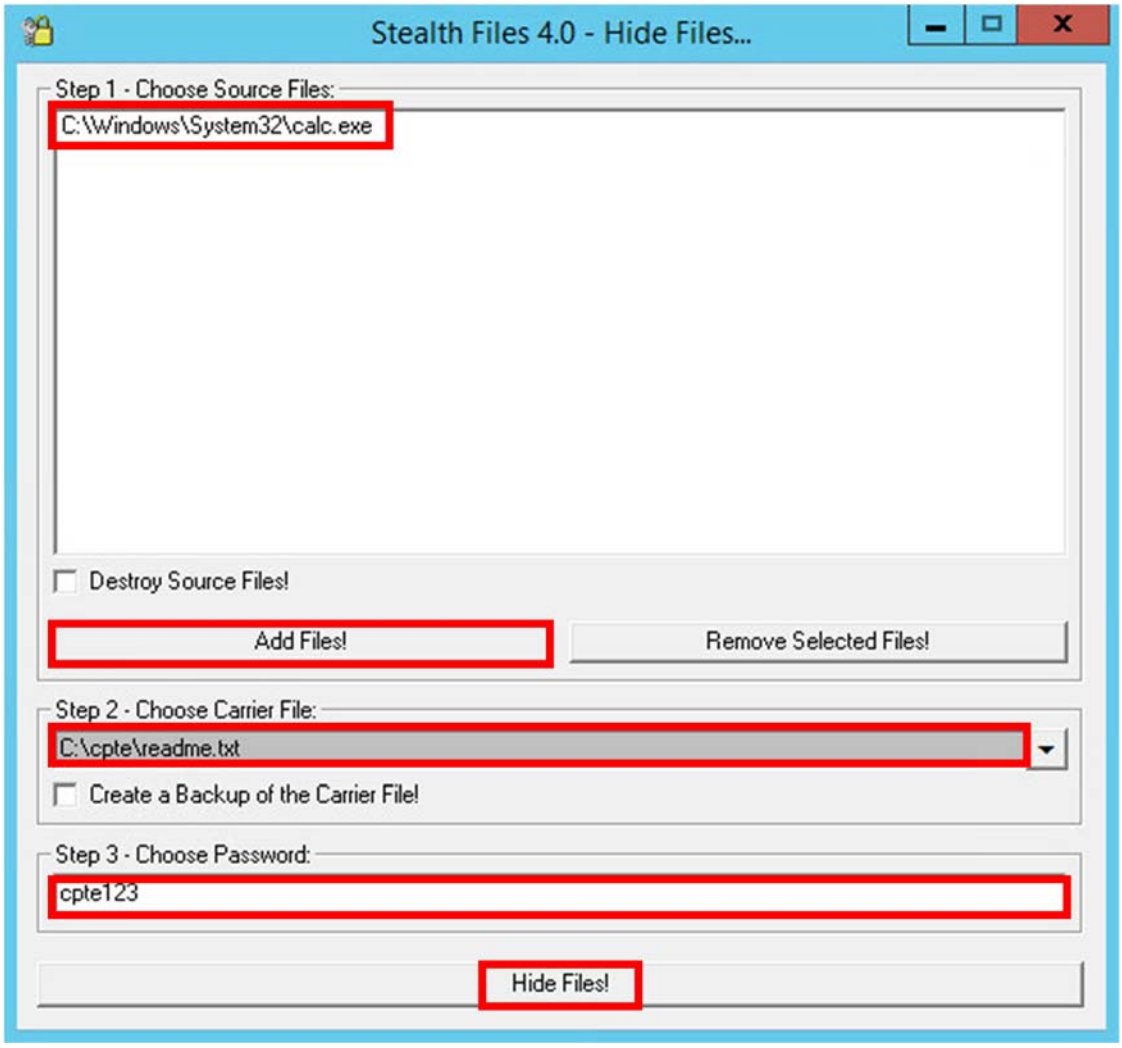
This is an alternative to encryption because no one can decrypt encrypted information or files unless they know that the hidden files exist.



Before Stealth Files hides a file, it compresses it and encrypts it with a password. Then you must select a carrier file, which is a file that contains the hidden files

You can also remove the hidden files from the carrier file by going to Remove Hidden Files and following the instructions

6. In **Step 1**, add the Calc.exe from c:\windows\system32\calc.exe.
7. **In Step 2**, choose the carrier file and add the file **Readme.txt** from the c:\cpte
8. **In Step 3**, choose a password such as cpte123 (you can type any desired password).



Step 1 to 3 screen

9. Click **Hide Files!**
10. It will hide the file **calc.exe** inside the **readme.txt** located on the desktop.
11. Open the notepad and check the file; **calc.exe** is copied inside it.

When you are ready to recover your hidden files, simply open them up with
Stealth Files, and if you gave the carrier file a password, you will be prompted to enter it again to recover the hidden files

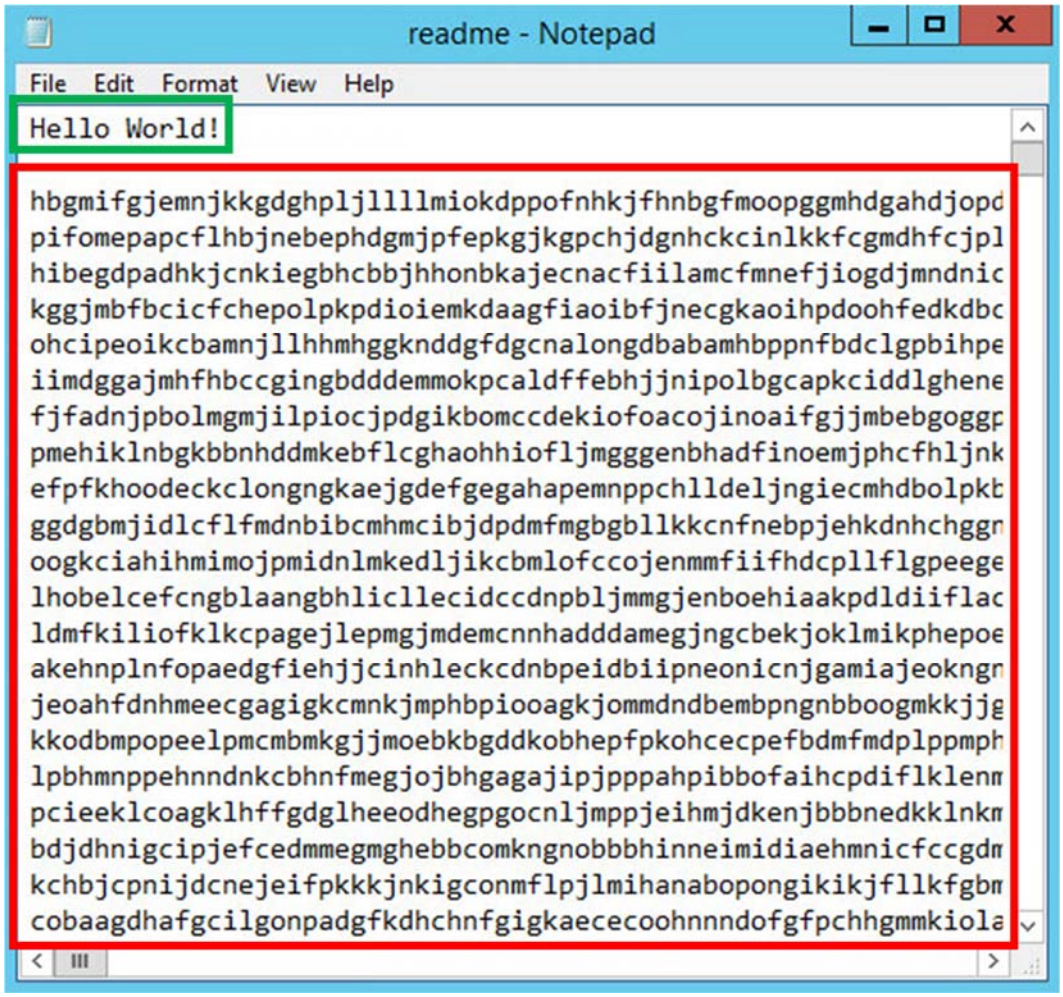


Figure: 5.5- Calc.exe copied inside Readme.txt

12. Now open the **Stealth files Control** panel and click **Retrieve Files**.

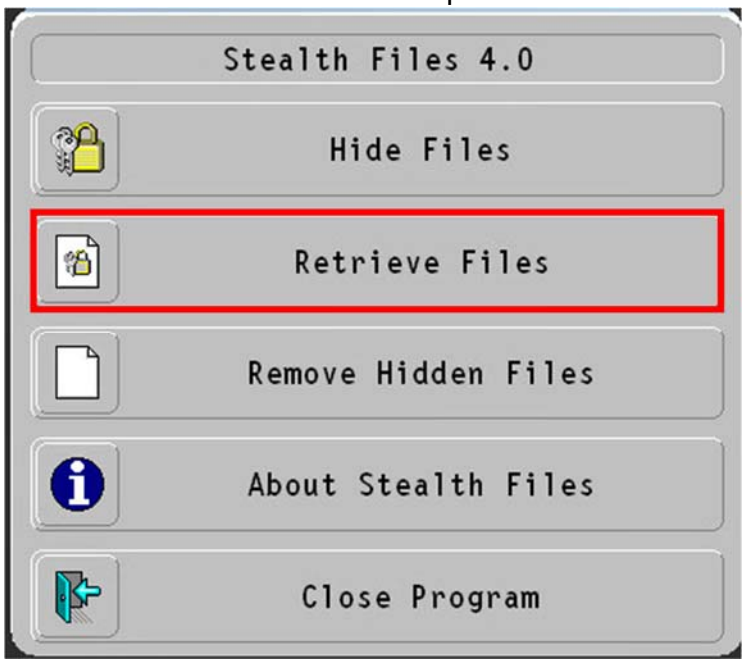


Figure: 5.6- Stealth Files main Window

Pictures will still look the same, sound file will still sound the same, and programs will still work fine

These carrier files will still work perfectly even with the hidden data in them

13. In **Step 1**, choose the file (Readme.txt) from the Desktop where you have saved the **calc.exe** file.
14. In **Step 2**, choose the path to store the retrieved hidden file. In the lab, the path is Desktop.
15. Enter the password magic (the password that is entered to hide the file) and click on **Retrieve Files!**

You can transfer the carrier file through the Internet, and the hidden files inside will transfer simultaneously.

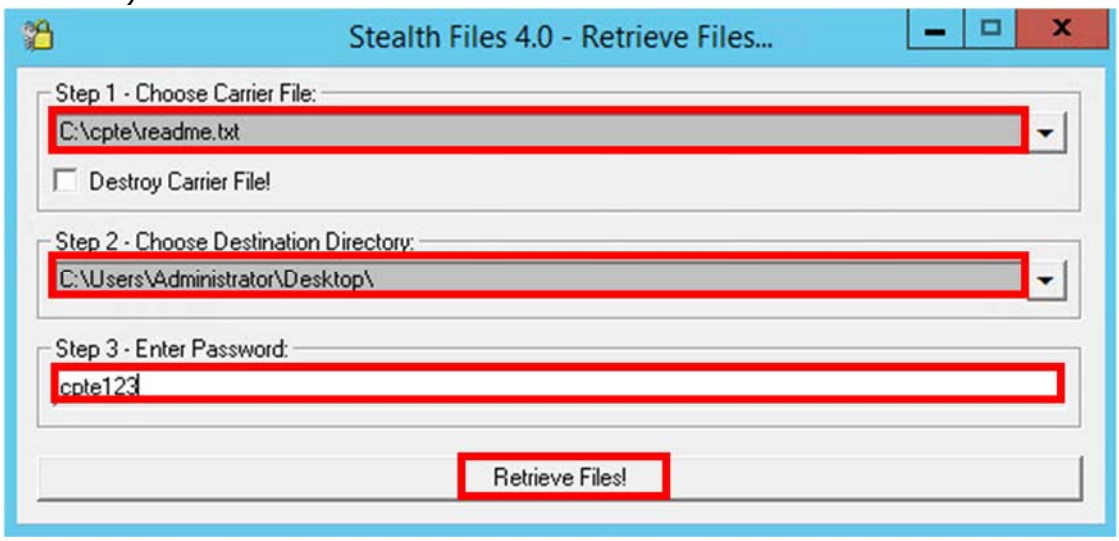


Figure: 5.7- Retrieve files main Window

16. The retrieved file is stored on the Desktop

Lab Analysis

Document all the results discovered during the lab.

Tool / Utility	Information Collected / Objectives Achieved
Stealth Files Tool	**Hidden Files:** Calc.exe (calculator)
	Retrieve File: readme.txt (Notepad)
	Output: Hidden calculator executed

Quiz

1. Evaluate other alternative parameters for hiding files.

Lab 5

Extracting SAM Hashes Using PWDump7 Tool

PWDump7 Overview

Pwdump7 runs by extracting the binary SAM and SYSTEM File from the Filesystem and then the hashes are extracted. For that task Rkdetector NTFS and FAT32 filesystem drivers are used.

Pwdump7 is also able to extract passwords offline by selecting the target files.

ICON KEY


Important Information


Quiz


CPTE Labs


Course Review

Lab Scenario

Passwords are a big part of this modern generation. You can use the password for your system to protect the business or secret information and you may choose to limit access to your PC with a Windows password. These passwords are an important security layer, but many passwords can be cracked and while that is worrisome, this can come to your rescue. In order to be an expert penetration tester, you must understand how to crack administrator passwords. In this lab, we discuss extracting the user login password hashes to crack the password.

It will teach you how to:

- Use the pwdump7 tool
- Crack administrator passwords

Lab Resources

To run this lab you need the following:

- **Pwdump7** located on C:\Drive
- Run this tool in Windows 7

Lab Duration

Time: 10 Minutes

Lab Tasks

1. Open the command prompt and type cd\ and press Enter
2. Now type **pwdump7.exe** and press **Enter**, which will display all the password hashes

Task 1

Generating Hashes

Active directory passwords are stored in the ntds.dit file and currently the stored structure

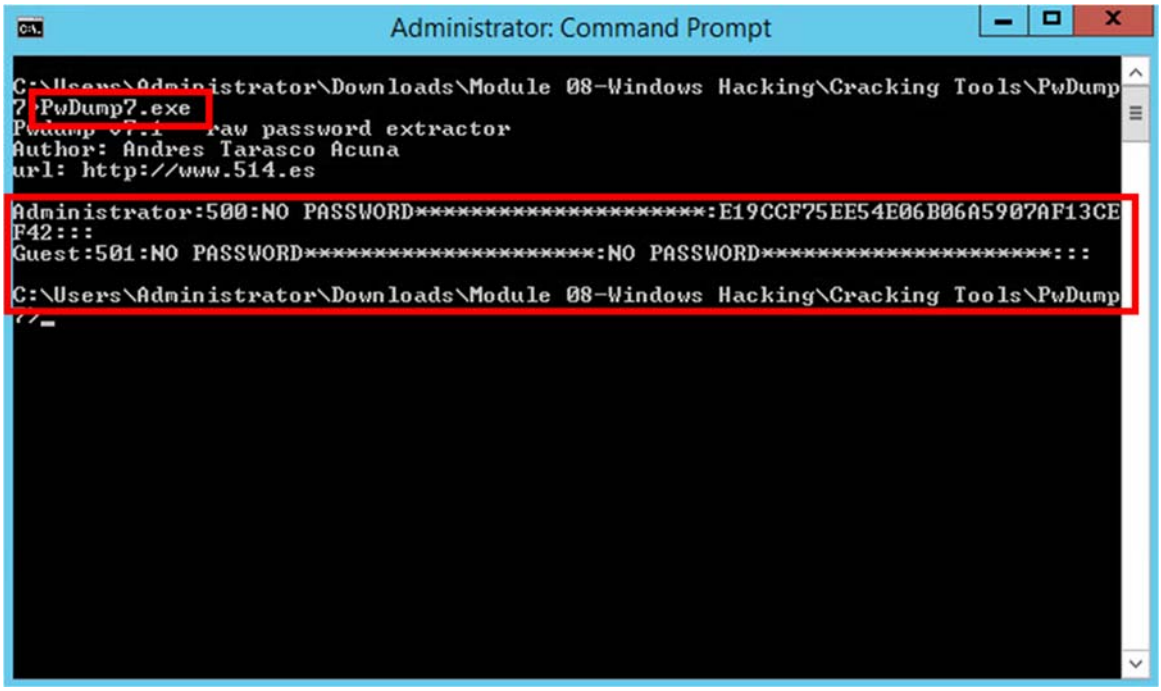


Figure: 6.1- Pwdump7.exe result window

3. Now type **pwdump7.exe > c:\hashes.txt** in the command prompt, and press **Enter**.
4. This command will copy all the data of **pwdump7.exe** to the **c:\hashes.txt** file. (To check the generated hashes you need to navigate to the C: drive.)

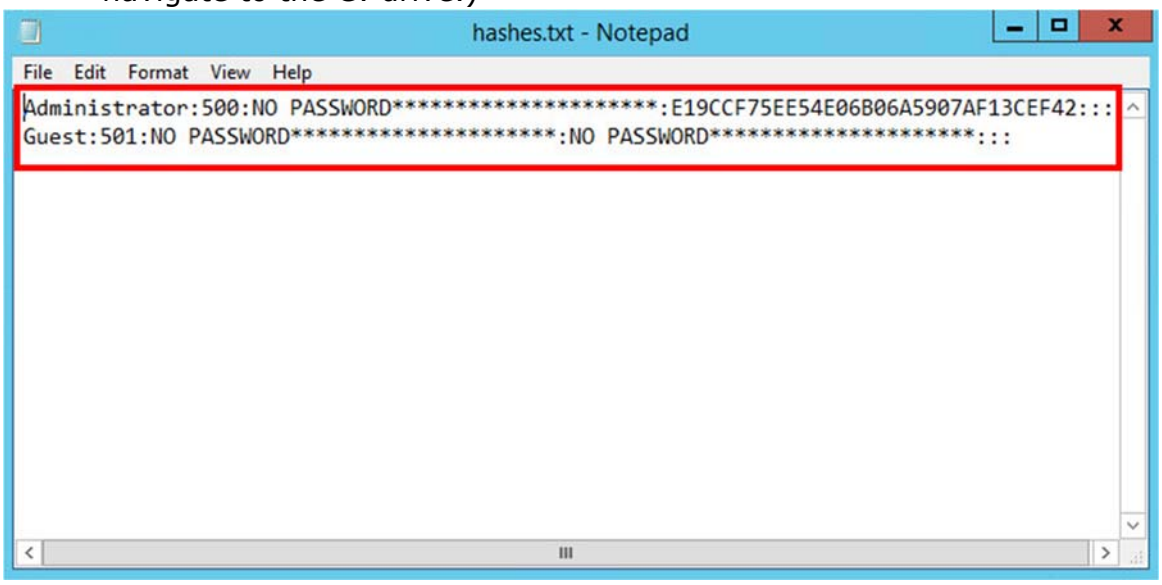


Figure: 6.2- hashes.txt contents

Lab Analysis

Analyze all the password hashes gathered during the lab and figure out what the password was.

Tool / Utility	Information Collected / Objectives Achieved
PWdump7	**Output:** List of User and Password Hashes • Administrator • Guest

Quiz

1. What is pwdump7.exe command used for?
2. How do you copy the result of a command to a file?
3. Dump password from SAM files.

Lab 6

Creating the Rainbow Tables Using Winrtgen

ICON KEY

Important Information

Quiz

CPTE Labs

Course Review

Winrtgen Overview

A rainbow table is a precomputed table for reversing cryptographic hash functions, usually for cracking password hashes. Tables are usually used in recovering plaintext passwords, up to a certain length, consisting of a limited set of characters.

Rainbow tables reduce the difficulty in brute force cracking a single password by creating a large pre-generated data set of hashes from nearly every possible password.

Winrtgen is a graphical Rainbow Tables Generator that supports LM, FastLM, NTLM, LMCHALL, HalfLMCHALL, NTLMCHALL, MSCACHE, MD2, MD4, MD5, SHA1, RIPEMD160, MySQL323, MySQLSHA1, CiscoPIX, ORACLE, SHA-2 (256), SHA-2 (384) and SHA-2 (512) hashes.

Lab Scenario

In computer and information security, the use of a password is essential for users to protect their data to ensure a seamless access to their system or machine. As users become increasingly aware of the need to adopt strong passwords, it also brings challenges to protection of potential data. In this lab, we will discuss creating the rainbow table to crack the user's system passwords. In order to be an expert penetration tester, you must understand how to create rainbow tables to crack the administrator password.

The objective of this lab is to help students create and use rainbow tables to perform system password hacking.

Lab Resources

To run this lab, you will need the following:

- **Winrtgen** located on Desktop
- Run this tool in Windows 7
- Administrative privileges to run the **Winrtgen**

Lab Duration

Time: 10 Minutes

Lab Tasks

1. Double-click the **winrtgen.exe** file located on the Desktop. The main window of **Winrtgen** is shown in the following figure.

Task 1

Generating Hashes

Active directory passwords are stored in the ntds.dit file

Rainbow tables are typically used to crack a lot of hash types, such as
NTLM, MD 5, SHA1

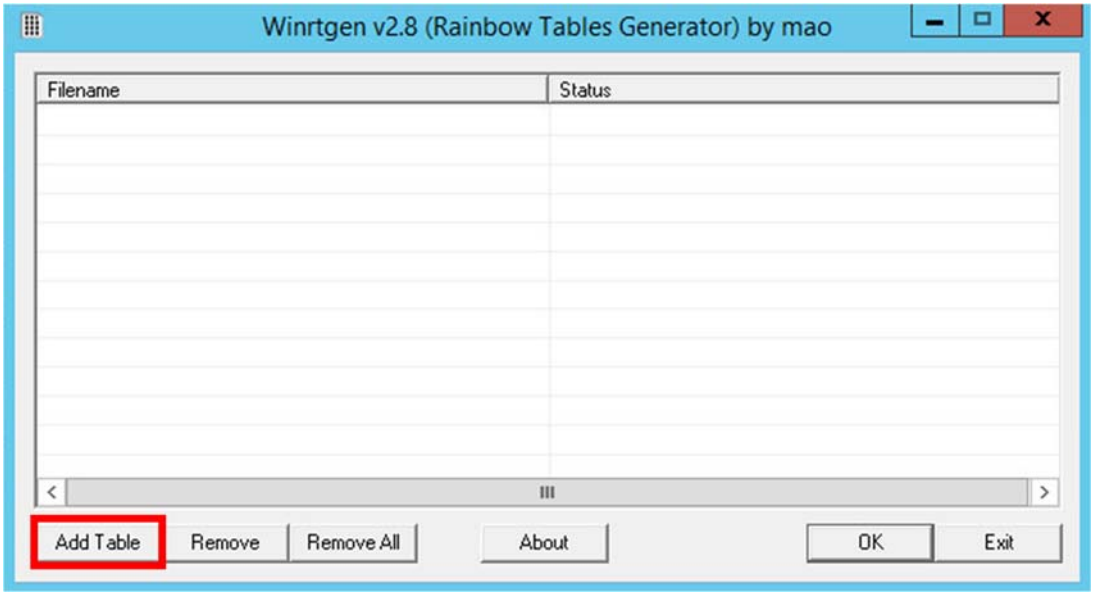


Figure: 7.1- Winrtgen main window

2. Click the **Add Table** button
3. The **Rainbow Table properties** window appears:
   i. Select **ntlm** from the **Hash** drop-down list
   ii. Set the **Min Len** as **4**, the **Max Len** as **9**, and the **Chain Count** of ***4000000***
   iii. Select **loweralpha** from the **Charset** drop-down list (this depends on the password).
4. Click **OK**.

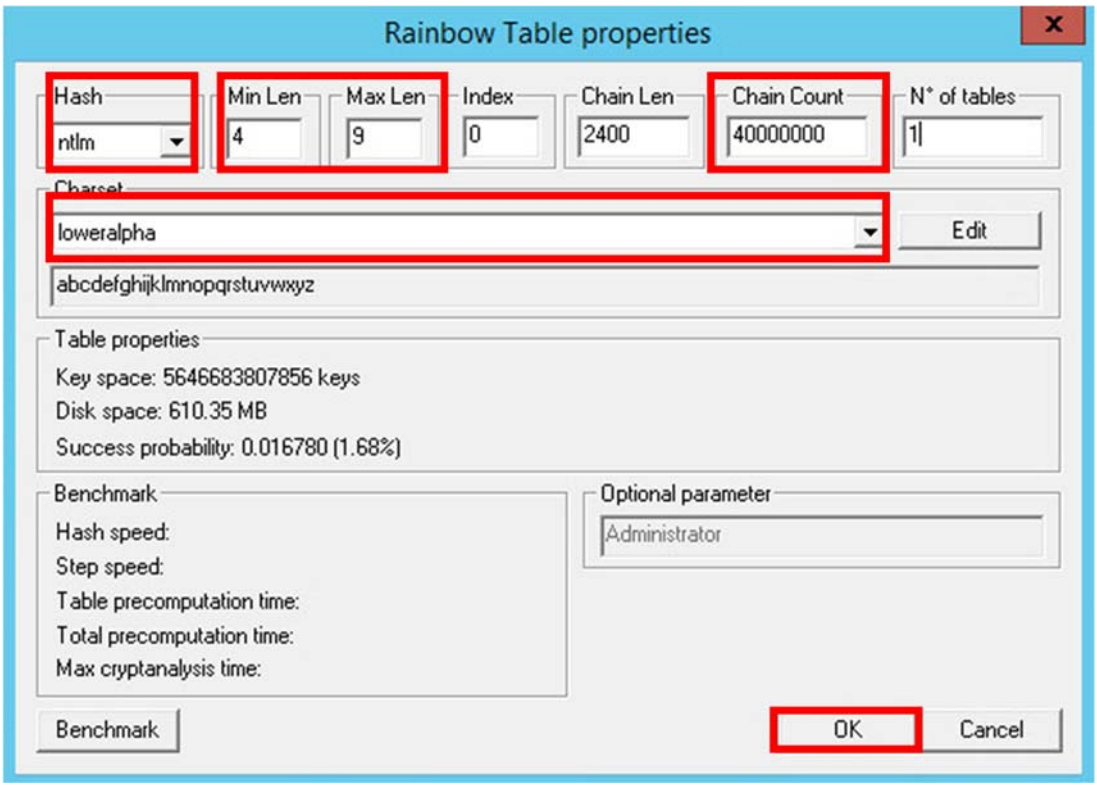


Figure: 7.2- Selecting the Rainbow table properties

5. A file will be created; click **OK**.

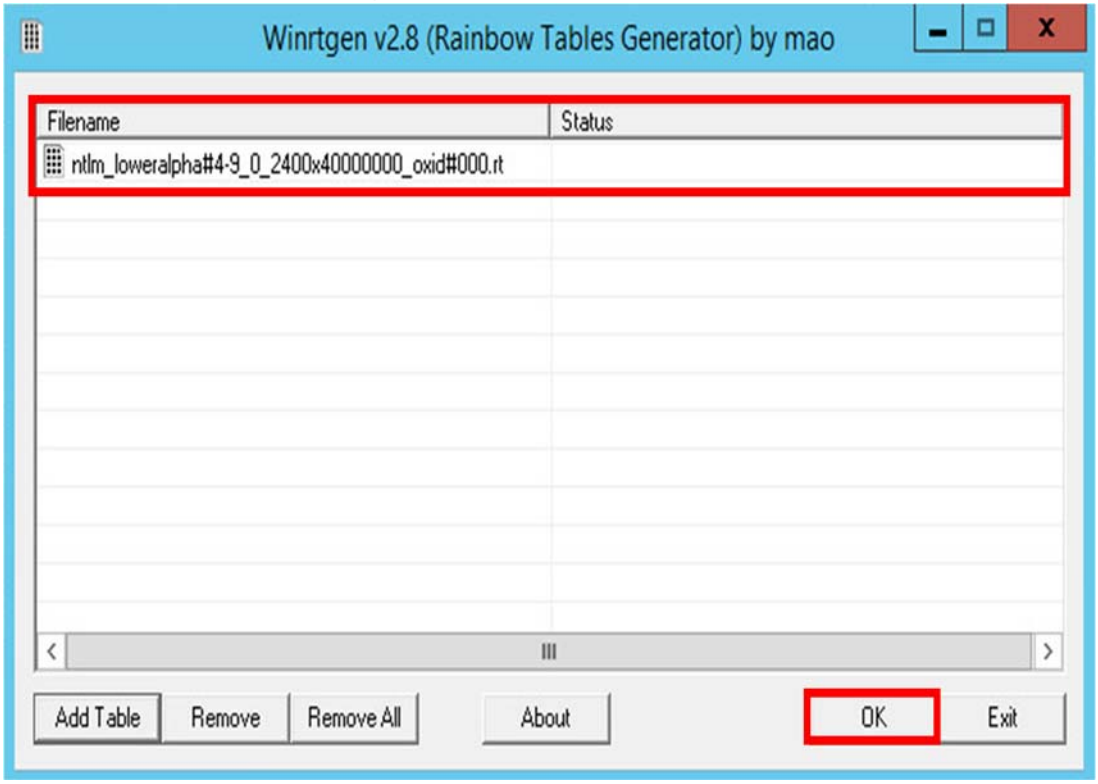


Figure: 7.3- Rainbow Table name to be generated

6. Creating the hash table will take some time, depending on the selected hash and charset. With the recommended settings this rainbow table will take 40 minutes to an hour to generate. Move on to the next module and come back to lab 7 once the rainbow table has finished.
7. The created hash table saved automatically in the folder containing **winrtgen.exe**.

Lab Analysis

Analyze all the password hashes gathered during the lab and figure out what the password was.

Tool / Utility	Information Collected / Objectives Achieved
Winrtgen	**Purpose:** Creating Rainbow table with lower alpha
	Output: Created Rainbow table: ntlm_lowe1-alpha#4-6_0_2400X4000000_ox...

Lab 7

Password Cracking Using RainbowCrack

RainbowCrack Overview

RainbowCrack is a computer program that generates rainbow tables to be used in password cracking. RainbowCrack differs from "conventional" brute force crackers in that it uses large pre-computed tables called rainbow tables to reduce the length of time needed to crack a password.
A brute force hash cracker generates all possible plaintexts and computes the corresponding hashes on the fly, then compares the hashes with the hash to be cracked. Once a match is found, the plaintext is found. If all possible plaintexts are tested and no match is found, the plaintext is not found. With this type of hash cracking, all intermediate computation results are discarded.
A time-memory tradeoff hash cracker needs a pre-computation stage, at that time all plaintext/hash pairs within the selected hash algorithm, charset, plaintext length are computed and results are stored in files called rainbow tables. It is time consuming to do this kind of computation. But once the one time pre-computation is finished, hashes stored in the table can be cracked with much better performance than a brute force cracker.

ICON KEY


Important Information

Quiz


CPTE Labs


Course Review

Lab Scenario

Computer passwords are like locks on doors; they keep honest people honest. If someone wishes to gain access to your laptop or computer, a simple login password will not stop them. Most computer users do not realize how simple it is to access the login password for a computer, and end up leaving vulnerable data on their computer, unencrypted and easy to access. Are you curious how easy it is for someone to gain access to your computer? Windows is still the most popular operating system, and the method used to discover the login password is the easiest.
A hacker uses password cracking utilities and cracks your system. That is how simple it is for someone to hack your password. It requires no technical skills, in laborious tasks, only simple words or programs. In order to be an expert penetration tester, you must understand how to crack administrator passwords. In this lab, we discuss how to crack guest users or administrator passwords using RainbowCrack.

The objective of this lab is to help students **crack passwords** to perform system password hacking.

Lab Resources

To run this lab, you need the following:

- **RainbowCrack** located on Desktop
- Run this tool in Windows 7
- Administrative privileges to run the **RainbowCrack**

Lab Duration

Time: 10 Minutes

Lab Tasks

1. Double-click the **rcrack_gui.exe** file on Desktop. The main window of **Rainbowcrack** is shown in the following figure.

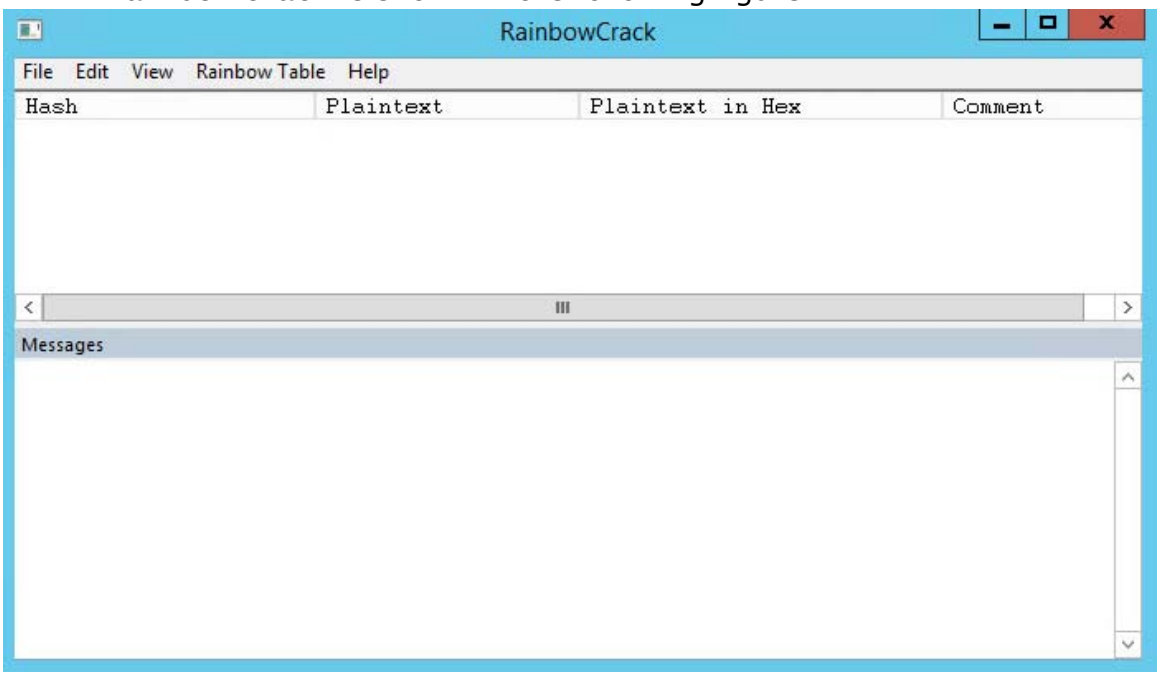


Figure: 8.1- RainbowCrack main window

Task 1

Generating the Rainbow Tables

RainbowCrack for GPU is the hash cracking program in RainbowCrack hash cracking utilities.

2. Click **File**, and then click **Add Hash…**

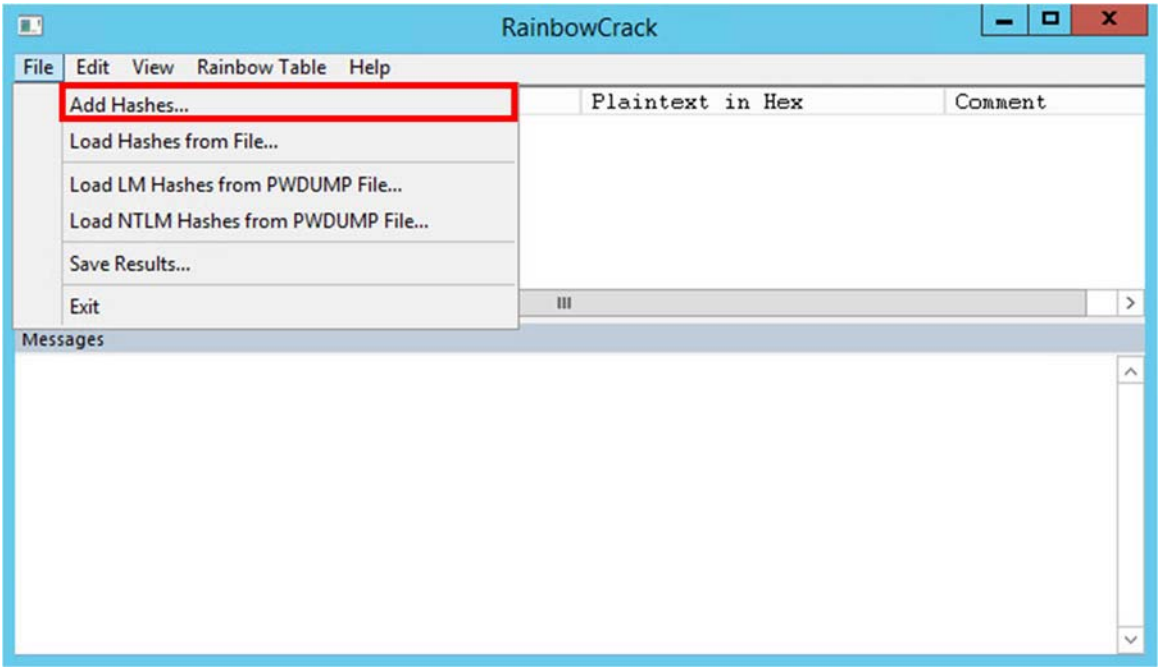


Figure: 8.2- Add Hash Values

3. The Add Hash window appears:
   a. Navigate to **c:\cpte**, and open the **hashes.txt** file (which is already generated using **Pwdump7** located at **c:\cpte\hashes.txt** in the previous **Lab 5**).
   b. Right-click, copy the hashes from hashes.txt file.
   c. Paste into the **Hash** field.
   d. Click **OK**.

RainbowCrack uses a Time-memory tradeoff algorithm to crack hashes. It differs from the hash crackers that use brute force algorithm

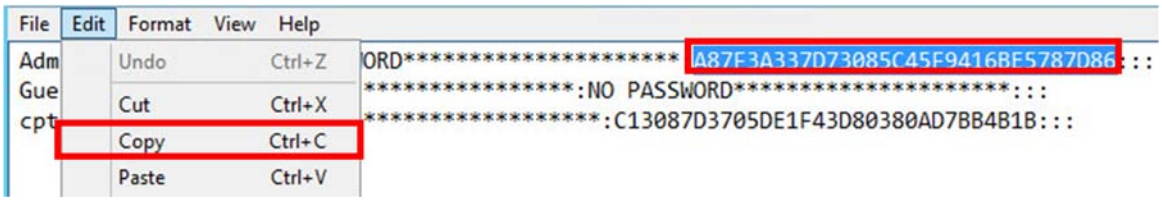


Figure: 8.3- Selecting the Hashes

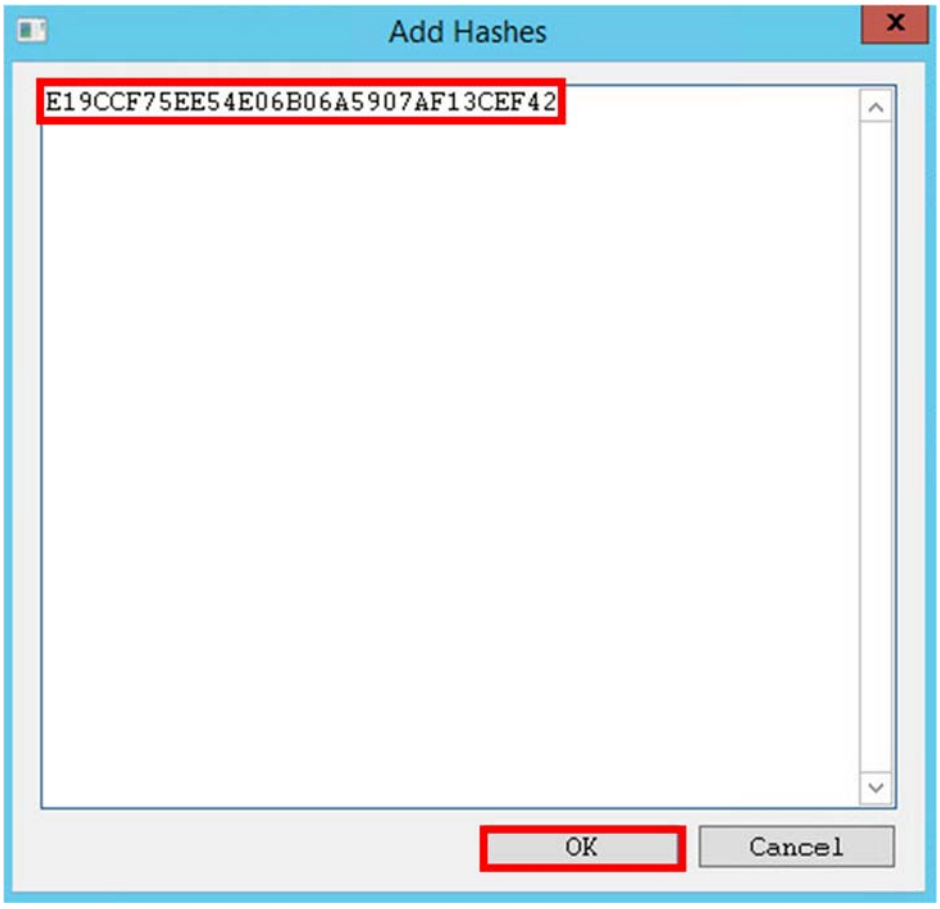
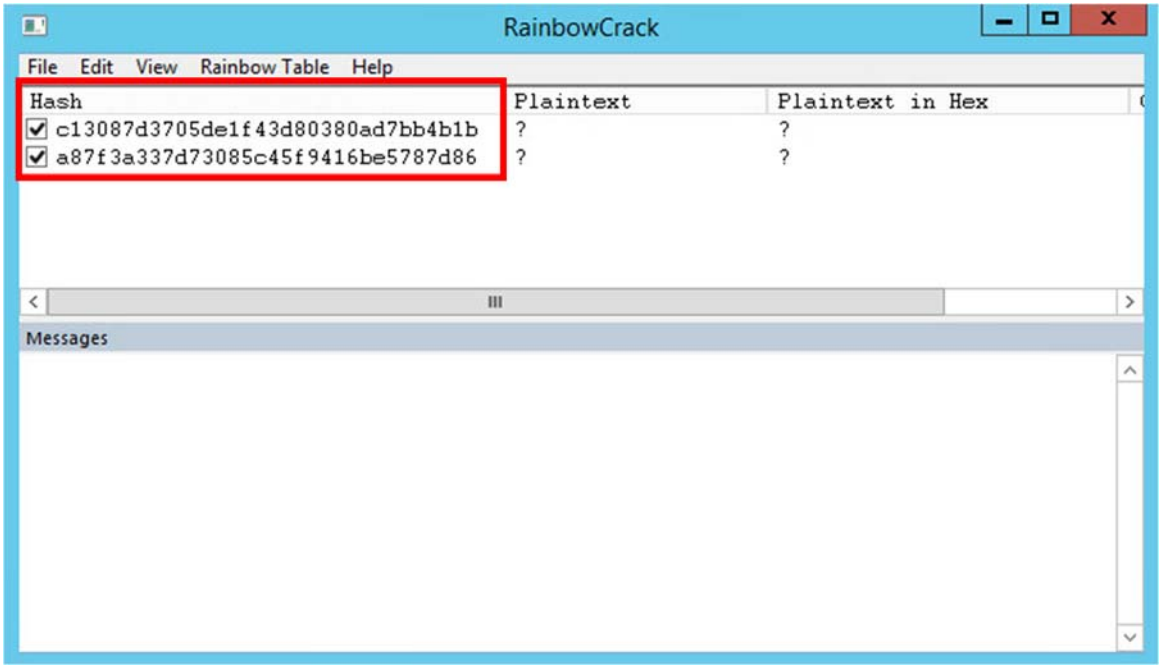


Figure: 8.4- Adding Hashes

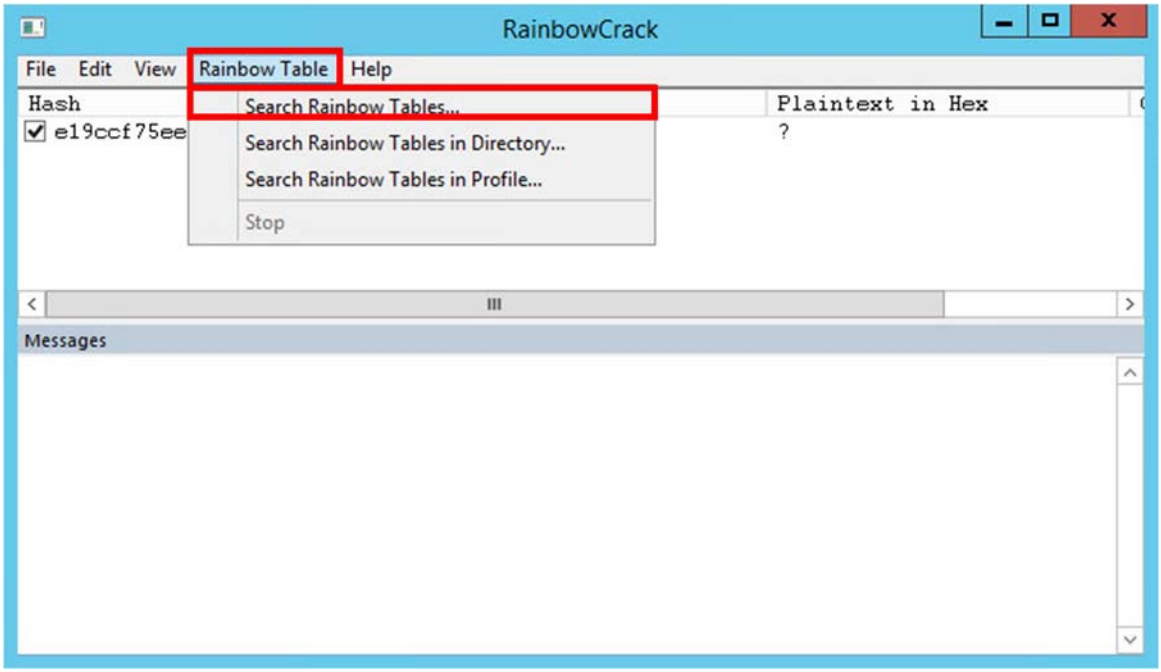
4. The selected hash is added, as shown in the following figure.



Full time-memory tradeoff tool suites, include rainbow table generation, sort, conversion and lookup

Figure: 8.5- Added Hash show in RainbowCrack main window

5. To add more hashes, repeat steps 2 & 3 (a,b,c,d)
6. Click the **Rainbow Table** from the menu bar, and click Search **Rainbow Table...**



RainbowCrack for GPU software uses GPU from NVIDIA for computing, instead of CPU. By offloading computation task to GPU, the RainbowCrack for GPU software can be ten times faster than non-GPU version.

Figure: 8.6- Adding RainbowCrack table

7. Browse the **Rainbow Table** that is already generated in the previous lab, which is located on Desktop
8. Click **Open**.

RainbowCrack for GPU software uses GPU from NVIDIA for computing, instead of CPU. By offloading computation task to GPU, the RainbowCrack for GPU software can be ten times faster than non-GPU version.

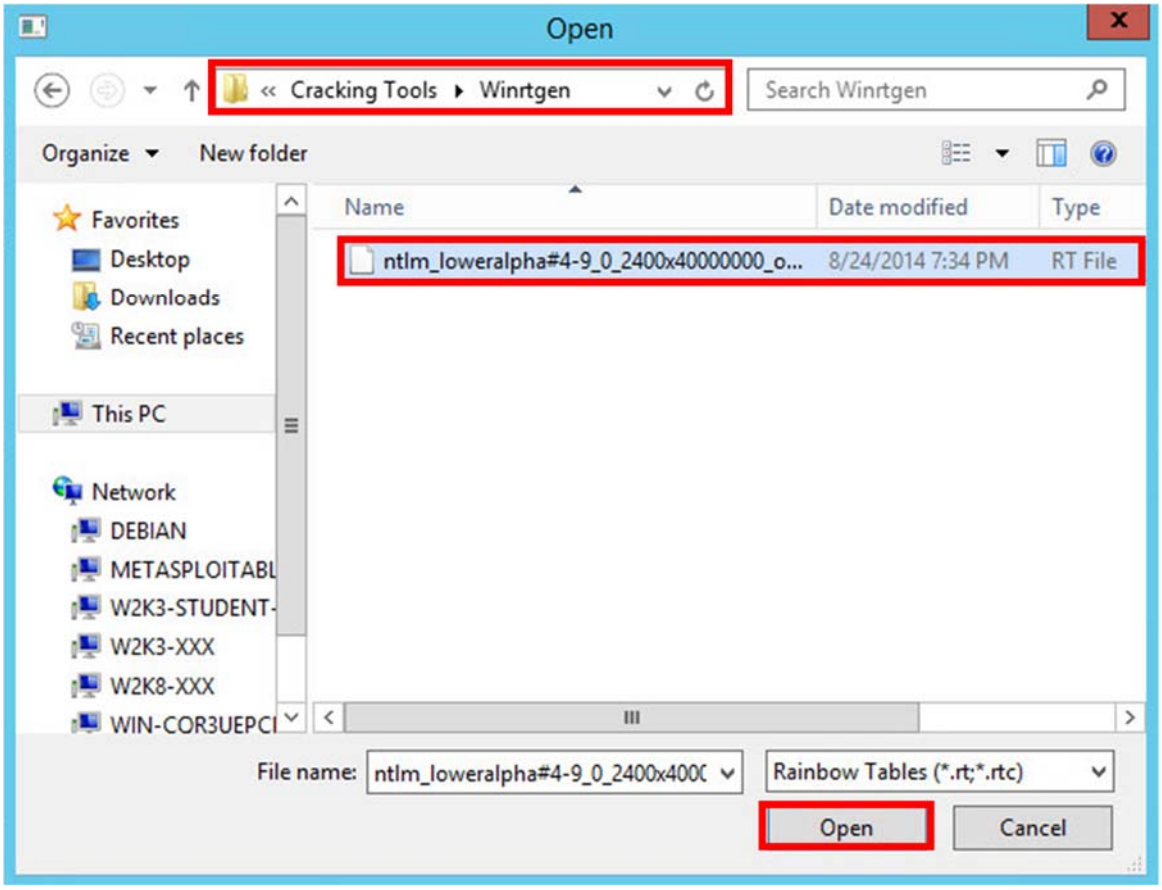


Figure: 8.5- Select Rainbow Table generated in the Winrtgen lab

9. It will crack the password, as shown in the following figure.

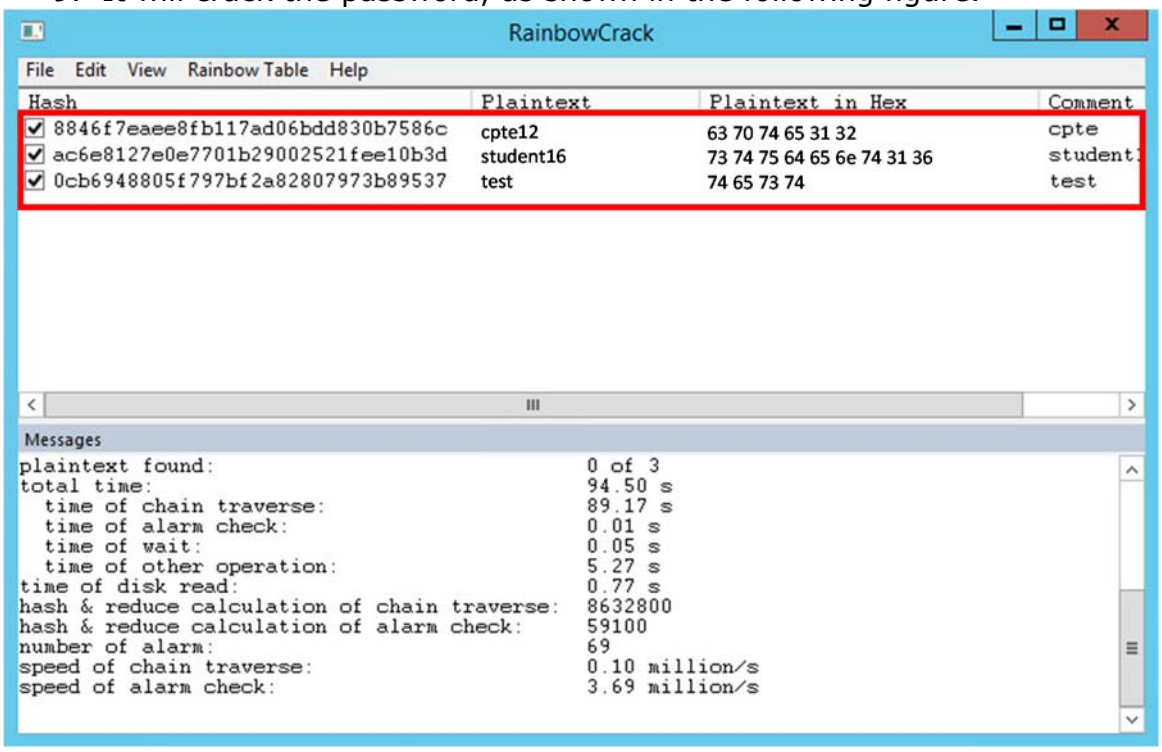


Figure: 8.6- Password cracked with Rainbow Table generated in the Winrtgen lab

Lab Analysis

Analyze and document the results related to the lab exercise.

Tool / Utility	Information Collected / Objectives Achieved
RainbowCrack	**Hashes:** • Administrator • Guest • Test • CPTE • STUDENT16 **Password Cracked:** • P@ssw0rd • test • test • cpte12 • student16

Quiz

1. What kind of hashes does RainbowCrack support?