**CPS3498 Computers Security**

**Lab 6: Steganography and East Eggs**

**Description:**

The term steganography comes from the Greek word *steganos*, which means “hidden” or covered.” Steganogrphy is the hiding of information. Unlike cryptography, the information is not scrambled or encoded; it is just hidden. On a computer system, steganography will hide one file inside another. Most often a text file will be hidden in an image or an MP3 file. This ability to hide information, sometimes in plain sight, poses a significant threat to the confidentiality of information.

In [computer software](http://en.wikipedia.org/wiki/Computer_software), Easter eggs are secret responses that occur in response to an undocumented set of commands. The results can vary from a simple printed message or image, to a page of programmer credits or a small videogame hidden inside an otherwise serious piece of software. Videogame [cheat codes](http://en.wikipedia.org/wiki/Cheat_codes) are a specific type of Easter egg, in which entering a secret command will unlock special powers or new levels for the player.

This lab uses a software tool called “camouflage” which is a Windows/Mac based tool to hide a text file with sensitive information in an image. You will post the image on a web site and also attach it to an Email. During the downloading of the image from either the web page or the Email attachment, you will observer if your system will detect a threat from the image. Also, we will test some of the known “East Egg” in software application.

**Procedure:**

**Lab 6.1 Steganography**

1. Long on to a Windows PC with the administrator account, or an account that has administrator privilege.
2. Go to <http://www.kean.edu/~jliou/resources.htm>. Download camouflage **Camouflage1.25** and save it on your MS Windows computer.
   1. **Camou1.25** may not work for Windows 8.1/10. There are other tools similar to the Camouflage such as S-Tools4, SilentEye, Steg (both support multi-OS including Mac OS), OurSecret, and openpuff (supports image, A/V and PDF files). **If Camor1.25 does not work for you, please download a different tool to complete the lab.**
   2. To download steganography software for Mac OS, go to <http://download.cnet.com/> and search for steganography. Or go to <http://www.jjtc.com/Steganography/tools.html> at your own risk. Your antivirus software may give you’re a warning while installing such software tool.
3. Install Camou1.25 onto your computer.
4. Open Notepad and type in Notepad:

Guess what, there is some secret hiding in the picture!

1. Save the file to the camouflage directory with file name: message.txt. Close Notepad.
2. On the desktop, right-click message.txt and select camouflage.txt. If you are not able to see camouflage after right-clicking, follow the step found on the menu to set a password for your steganography file.
   1. On the camouflage screen, click Next. (This is the message that you are going to hide.)
   2. In the Camouflage Using Text box, click the Browse button (indicate by …), navigate to the directory that contains the image file (your\_image.jpg) you will use, and click Open.
   3. On the camouflage screen, click Next.
   4. On the Create This File screen, click Next.
   5. On the Password screen, type **abc123** in both boxes and click Finish.
3. Open Notepad and type the following HTML code (modify the code for your own situation):

<html>

<head><title> My Family Pictures </title></head>

<body>

<p> My favorite picture <br />

<image src=”your\_image.jpg” title=”image\_title”

Alt=”image” width=”400” height =”300” />

</p>

</body>

</html>

1. Save the html file as “camouflage.html.” Post the html file onto eve.kean.edu by using SSH to upload it to your **public\_html** directory. You need to upload the image file onto eve, too. Note that both files must have 0755 permission.
2. Open a web browser.
   1. Enter http://eve.kean.edu/~your\_login\_id/ camouflage.html in the URL box and press Enter.
   2. Right-click the image in the web page and select Save Picture As to save the file onto your desktop. Does your antivirus software give your any warning message?
   3. Right-click the image file and perform Scan with [your antivirus software]. Observe the result.
3. Right-click the image file and select uncamouflage, or use the menu to uncamouflage.”
   1. Enter password you set at the step 6e and click Next. What does Camouflage show?
   2. Select the message.txt file and click Next. On the Extract to folder screen, click Finish. Now double-click the message.txt on the desktop.
4. Login to your Email account at Kean, attached the same image with hidden message to an Email and send it to yourself at different Email server. Login to that Email account and open the Email you just sent. Open (not save) the attached file. Does your Email server give you any warning message?

**Lab 6.2 East Egg**

1. Launch an new blank document on your MS Word (it can be either a Windows or Mac version):
   1. Type “a = rand()” and press enter, anything special?
   2. Type “=rand()” and press enter. What do you see on screen?
2. Clear what shown on word document. Now type “=rand(10,10)” and press enter. What do you see on screen?
3. Clear what shown on word document. Now type “=lorem(N),” where N is an integer, and press enter. What do you see on screen?
4. Search on the Internet to find any particular software East Egg and verify it on your PC.

**Notes and Suggestions:**

* Different computers may have different operating systems and hardware configurations. If you use your own computer for this lab, the above procedure may not be completely applicable. For example, you cannot follow the same procedure for MAC computer.
* Make sure that the computer is back to its original condition. Do not leave a computer in a non-functioning condition.

**Lab report:**

* Your report should include all information required to be noted in the procedure, any problems/issues you encountered during the lab and how did you resolve them.