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Course: CMIT 436 | Cloud Security

Institution: University of Maryland Global Campus (UMGC)

Lab Title: Displaying Metadata Information

Objective

The objective of this lab was to learn how to display, analyze, and modify metadata information stored within image files using ExifTool. This lab focused on understanding file metadata, installing required tools, and verifying metadata changes through command-line analysis.

Tools & Environment Used

- uCertify Virtual Lab (Linux Environment)
- Ubuntu Linux
- Terminal
- ExifTool
- Image file: ubuntu-default-greyscale-wallpaper.png

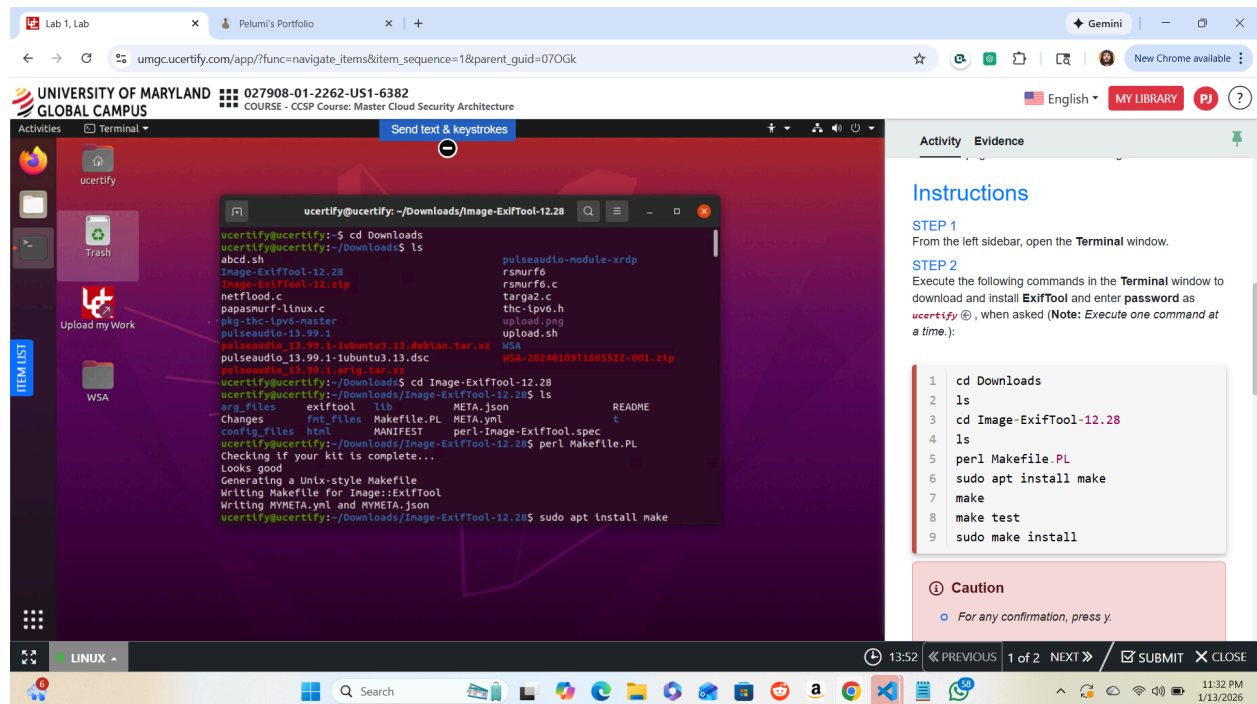
Lab Overview

Metadata is hidden information embedded within files that describes attributes such as file type, size, timestamps, and creation details. In this lab, ExifTool was used to read and modify metadata within an image file, demonstrating how metadata can reveal valuable forensic and security-related information.

The screenshot displays the uCertify virtual lab environment. The main window shows a Linux desktop with a greyscale cat wallpaper, a terminal window, and a file manager. The interface includes a top navigation bar with the University of Maryland Global Campus logo and course information (027908-01-2262-US1-6382, COURSE - CCSP Course: Master Cloud Security Architecture). A right sidebar contains a 'Please remember' section with instructions for the 'Autograded Activity' and an 'Objective of the Lab' section stating the goal is to display metadata information. The bottom status bar shows the time as 11:27 PM on 1/13/2026.

Step 1: Opening the Terminal

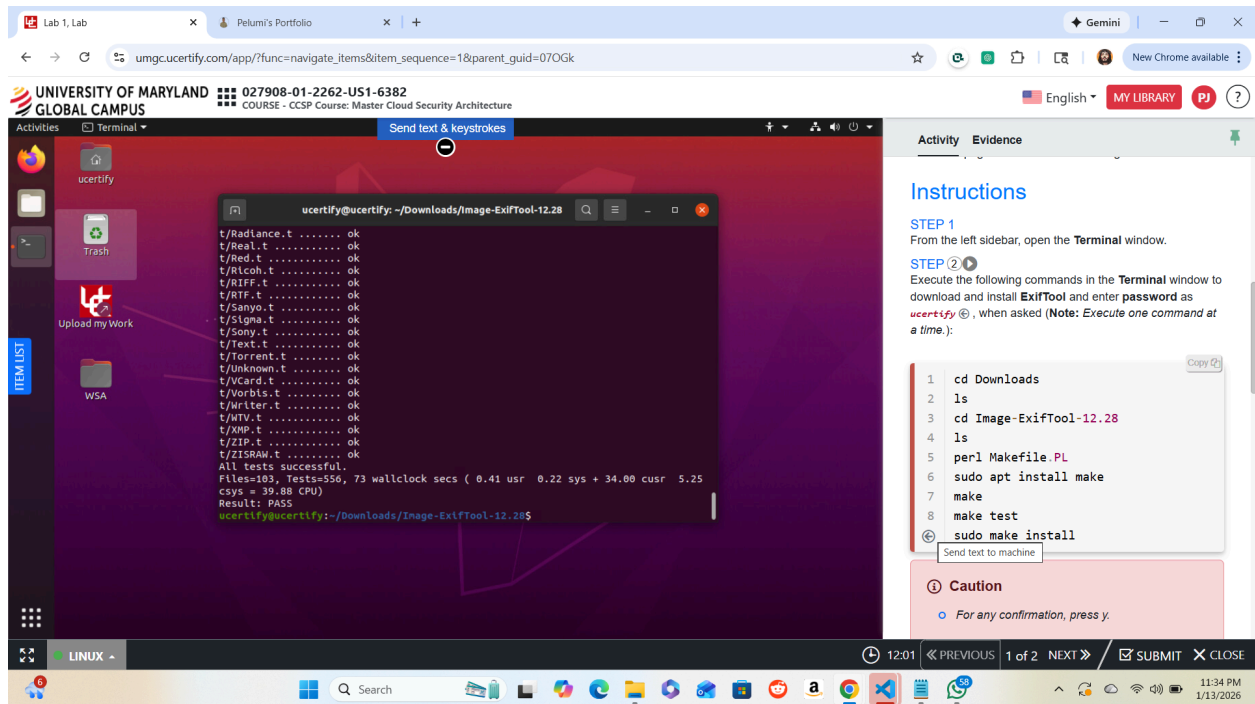
The Terminal window was opened from the left sidebar of the Ubuntu desktop. The terminal was used to execute all required commands for downloading, installing, and running ExifTool.



Step 2: Installing ExifTool

Using the terminal, the Downloads directory was accessed and the ExifTool package was extracted. The following steps were completed to install ExifTool:

- Navigated to the Image-ExifTool directory
- Generated the Makefile using Perl
- Installed required dependencies
- Compiled and installed ExifTool
- Verified installation completion



Step 3: Displaying Metadata

ExifTool was executed against the file located at:

/usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png

The output displayed detailed metadata including:

- File name and directory
- File size and permissions
- Image dimensions and format
- Modification and access timestamps

The screenshot shows a virtual machine environment with a terminal window open. The terminal displays the output of the command `sudo exiftool /usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png`. The output lists various file metadata including file name, directory, size, modification date, access date, inode change date, permissions, file type, MIME type, image dimensions, bit depth, color type, compression, filter, interlace, image size, and megapixels.

On the right side of the interface, there is a sidebar with a 'Note' section stating: 'ExifTool allows you to read, write, and edit meta information of image files.' Below this, there are three steps:

- STEP 3**: Execute the following command in the Terminal window to add and display metadata of `/usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png` file:
`sudo exiftool /usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png`
- STEP 4**: Execute the following command in the Terminal window to add a New data in metadata of `/usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png` file:
`sudo exiftool -overwrite_original -XMP:cc: /usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png`
- STEP 5**: Execute the following command in the Terminal window to verify the new data Attribution Name as uCertify:

Step 4: Adding Metadata

A new metadata attribute was added to the image file using ExifTool. The attribution name was set to identify uCertify as the source. The original file was overwritten as instructed.

The screenshot shows the same virtual machine environment as before, but now the terminal window displays the output of the command `sudo exiftool -overwrite_original -XMP:cc: /usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png`. The output includes the same file metadata as before, but with an additional 'XMP Toolkit' entry: 'XMP Toolkit : Image::ExifTool 12.28'.

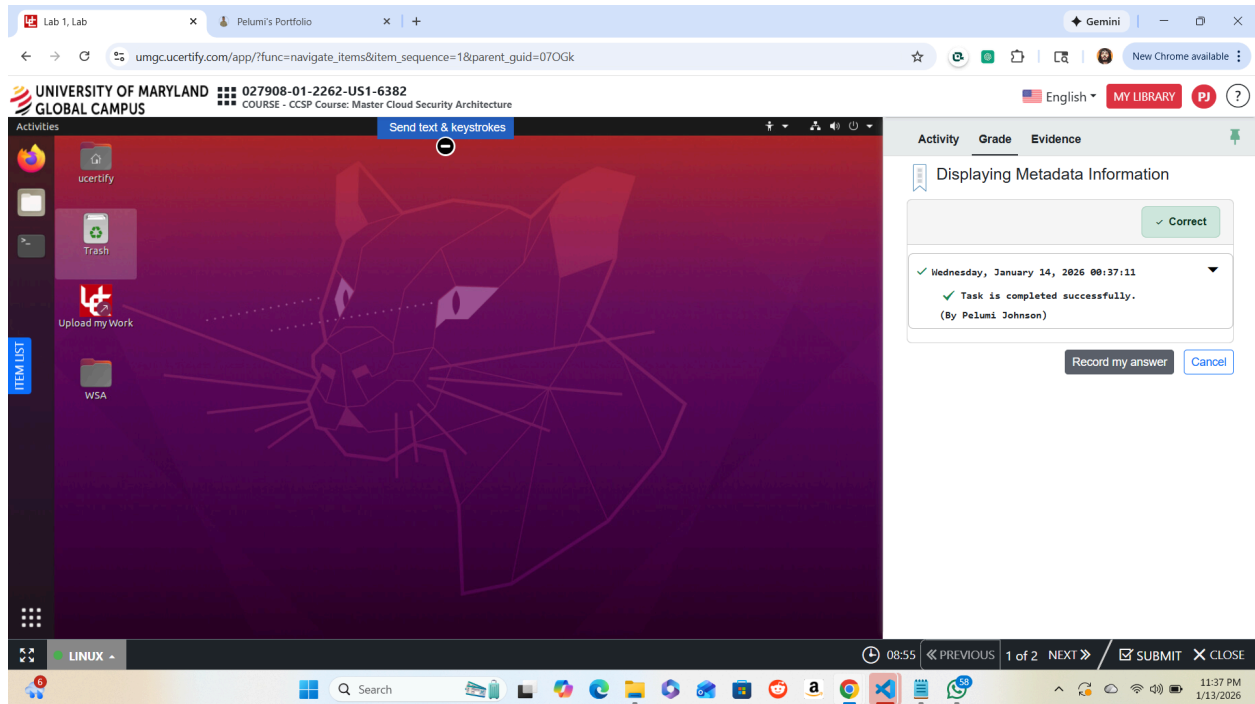
On the right side of the interface, the sidebar now shows a 'Note' section with the text: 'add a New data in metadata of `/usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png` file:'. Below this, there are two steps:

- STEP 5**: Execute the following command in the Terminal window to verify the new data Attribution Name as uCertify:
`exiftool /usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png`
- STEP 6**: Close all windows.

Below the steps, there is a 'Solution Video' section with a video player showing the uCertify logo.

Step 5: Verifying Metadata Changes

ExifTool was run again on the same image file to confirm that the new metadata attribute was successfully added. The output verified that the attribution name was present and correctly recorded.



Results

- ExifTool was successfully installed and executed
- Image metadata was displayed without errors
- A new metadata attribute was added successfully
- Metadata changes were verified using ExifTool

Conclusion

This lab demonstrated how metadata can be accessed and modified using command-line tools. By working with ExifTool, I gained hands-on experience analyzing file metadata, which is an important skill in cloud security, digital forensics, and incident investigations. Understanding metadata helps security professionals identify file origins, changes, and potential indicators of compromise.

Key Takeaways

- Metadata provides hidden but valuable information about files
- ExifTool is a powerful utility for reading and editing metadata
- Command-line analysis is essential for forensic investigations

- Metadata analysis supports cloud security and incident response workflows