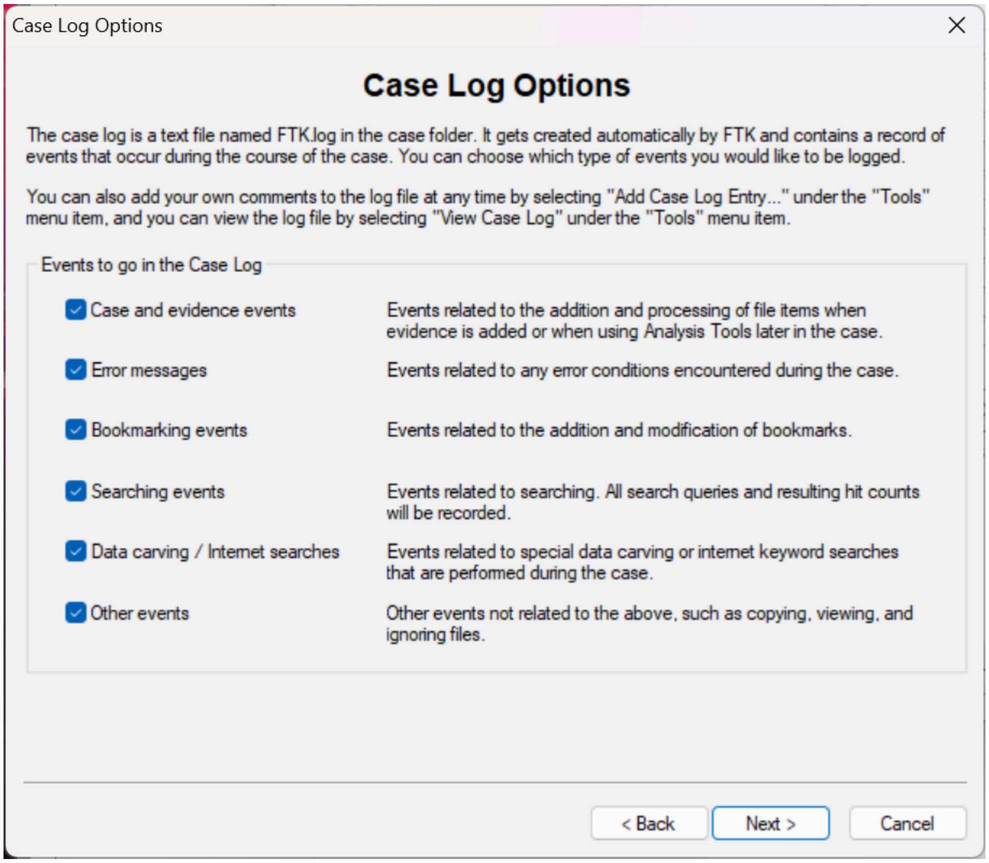
Computer & Network Forensics

Lab 3

Introduction to Forensics Analysis using FTK

Questions

1. Case Log Options



Case Log Options

The case log is a text file named FTK.log in the case folder. It gets created automatically by FTK and contains a record of events that occur during the course of the case. You can choose which type of events you would like to be logged.

You can also add your own comments to the log file at any time by selecting "Add Case Log Entry..." under the "Tools" menu item, and you can view the log file by selecting "View Case Log" under the "Tools" menu item.

Events to go in the Case Log

☑ Case and evidence events — Events related to the addition and processing of file items when evidence is added or when using Analysis Tools later in the case.

☑ Error messages — Events related to any error conditions encountered during the case.

☑ Bookmarking events — Events related to the addition and modification of bookmarks.

☑ Searching events — Events related to searching. All search queries and resulting hit counts will be recorded.

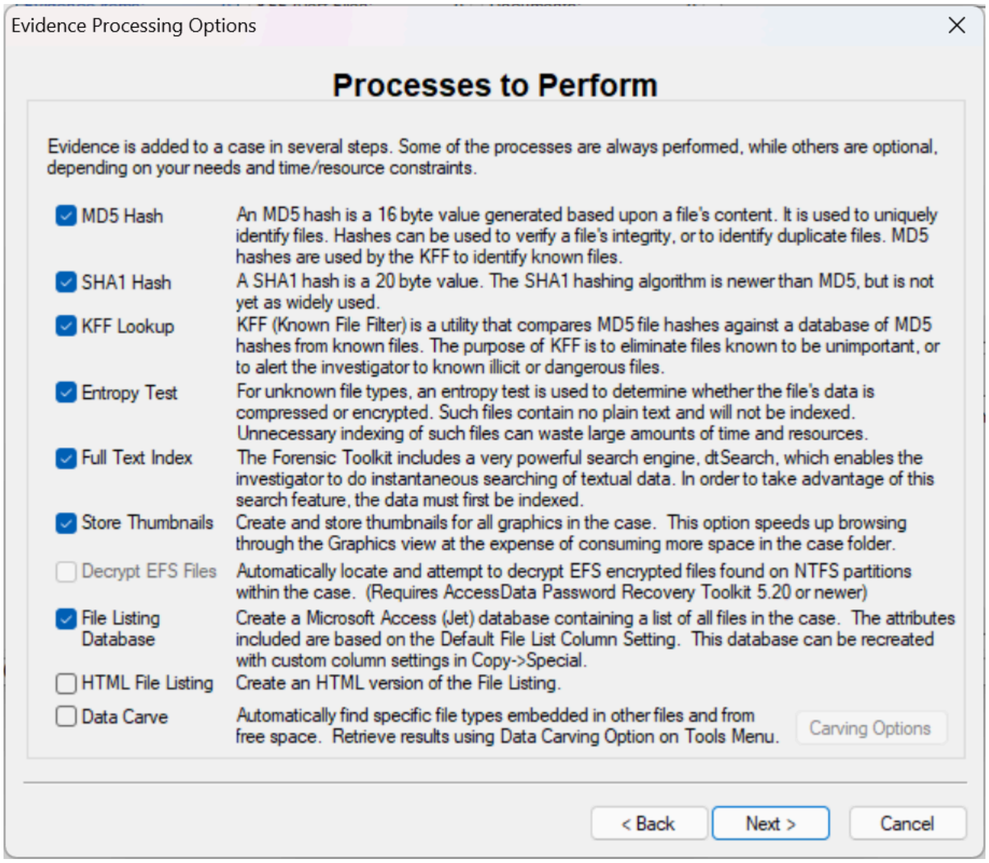
☑ Data carving / Internet searches — Events related to special data carving or internet keyword searches that are performed during the case.

☑ Other events — Other events not related to the above, such as copying, viewing, and ignoring files.

1. **What is the format of the FTK.log file?**
   The FTK.log file is a text file created automatically by FTK in the case folder. It is stored in plain text (.log) format and can be opened and viewed with any text editor.

2. **What is a log file used for?**
   A log file is used to record a detailed history of events and actions that occur during a forensic case. It provides an audit trail showing what was done, when, and by whom – useful for documentation, verification, and accountability.
3. **What kind of events can be recorded in a log file?**
   - Case and evidence events (when evidence is added or processed)
   - Error messages
   - Bookmarking events
   - Searching events (all search queries and hit counts)
   - Data carving / Internet search events
   - Other events (e.g., copying, viewing, or ignoring files)
4. **How can you add comments to a log file?**
   Comments can be added by selecting “Add Case Log Entry…” under the Tools menu in FTK.
5. **List 3 events that can go in a Case Log.**
   - Adding or processing evidence files
   - Recording search queries and results
   - Logging error messages or warnings

2. Process to Perform



Evidence Processing Options

Processes to Perform

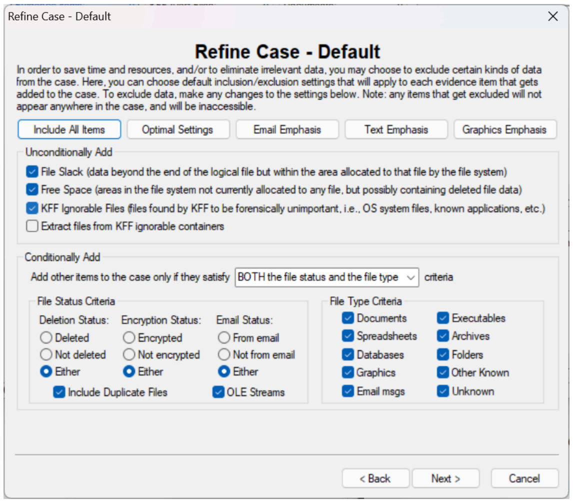
Evidence is added to a case in several steps. Some of the processes are always performed, while others are optional, depending on your needs and time/resource constraints.

☑ MD5 Hash	An MD5 hash is a 16 byte value generated based upon a file's content. It is used to uniquely identify files. Hashes can be used to verify a file's integrity, or to identify duplicate files. MD5 hashes are used by the KFF to identify known files.
☑ SHA1 Hash	A SHA1 hash is a 20 byte value. The SHA1 hashing algorithm is newer than MD5, but is not yet as widely used.
☑ KFF Lookup	KFF (Known File Filter) is a utility that compares MD5 file hashes against a database of MD5 hashes from known files. The purpose of KFF is to eliminate files known to be unimportant, or to alert the investigator to known illicit or dangerous files.
☑ Entropy Test	For unknown file types, an entropy test is used to determine whether the file's data is compressed or encrypted. Such files contain no plain text and will not be indexed. Unnecessary indexing of such files can waste large amounts of time and resources.
☑ Full Text Index	The Forensic Toolkit includes a very powerful search engine, dtSearch, which enables the investigator to do instantaneous searching of textual data. In order to take advantage of this search feature, the data must first be indexed.
☑ Store Thumbnails	Create and store thumbnails for all graphics in the case. This option speeds up browsing through the Graphics view at the expense of consuming more space in the case folder.
□ Decrypt EFS Files	Automatically locate and attempt to decrypt EFS encrypted files found on NTFS partitions within the case. (Requires AccessData Password Recovery Toolkit 5.20 or newer)
☑ File Listing Database	Create a Microsoft Access (Jet) database containing a list of all files in the case. The attributes included are based on the Default File List Column Setting. This database can be recreated with custom column settings in Copy->Special.
□ HTML File Listing	Create an HTML version of the File Listing.
□ Data Carve	Automatically find specific file types embedded in other files and from free space. Retrieve results using Data Carving Option on Tools Menu.

1. **How many bits in a MD5 and SHA1 key? List 3 other Hash Algorithms**
    - MD5: 128 bits (16 bytes)
    - SHA-1: 160 bits (20 bytes)
    - Other hash algorithms: SHA-256, SHA-512, CRC32
2. **What is the function of the KFF utility?**
   The KFF (Known File Filter) utility compares MD5 file hashes against a database of known file hashes.
   Its main purpose is to:
    - Eliminate files known to be unimportant (like standard system files).
    - Identify known illicit or dangerous files by matching their hashes to known bad entries.
3. **What is an Entropy Test?**
   An entropy test is used to measure the randomness of data in a file.
    - It helps determine whether a file's data is compressed or encrypted.
    - Files with high entropy likely contain encrypted or compressed data and therefore contain no plain text, meaning they will not be indexed by FTK.
4. **How can we check if a file is compressed?**
    - Running an entropy test — high entropy indicates compression or encryption.
    - Checking the file header or extension (e.g., .zip, .rar, .gz).
    - Looking at FTK's file details or properties (FTK identifies compressed files during analysis).
5. **Why does data need to be indexed?**
   Data is indexed to enable fast and efficient keyword searching.
   FTK uses its built-in search engine (dtSearch) to quickly locate text or data across all files.
   Without indexing, searches would be very slow because FTK would need to scan each file individually.
6. **What does HTML File Listing function do?**
   The HTML File Listing function creates an HTML version of the file listing – a browsable webpage that shows all files and their metadata.
   This allows examiners or reviewers to view the case contents in a browser without using FTK.
7. **What is a thumbnail?**
   A thumbnail is a small preview image automatically generated for each picture file in the case.
   It allows the examiner to quickly view and identify images without opening each one individually.
   FTK stores these thumbnails to speed up browsing in the Graphics view.
8. **What other types of databases can be used to store lists of files?**
   FTK uses a Microsoft Access (Jet) database for file listings, but other databases can also be used, such as: MySQL, PostgreSQL, SQLite

9. **What is data carving? “Research further”**
   Data carving is the forensic process of recovering files from unallocated or free space on a disk by searching for known file signatures (headers and footers).
   It does not rely on file system metadata – instead, it reconstructs files based on their binary patterns.
   This technique is especially useful for recovering deleted, damaged, or partially overwritten files.

3. Refine Case - Default



Refine Case - Default

In order to save time and resources, and/or to eliminate irrelevant data, you may choose to exclude certain kinds of data from the case. Here, you can choose default inclusion/exclusion settings that will apply to each evidence item that gets added to the case. To exclude data, make any changes to the settings below. Note: any items that get excluded will not appear anywhere in the case, and will be inaccessible.

Unconditionally Add
- ☑ File Slack (data beyond the end of the logical file but within the area allocated to that file by the file system)
- ☑ Free Space (areas in the file system not currently allocated to any file, but possibly containing deleted file data)
- ☑ KFF Ignorable Files (files found by KFF to be forensically unimportant, i.e., OS system files, known applications, etc.)
- □ Extract files from KFF ignorable containers

Conditionally Add

Add other items to the case only if they satisfy [BOTH the file status and the file type] criteria

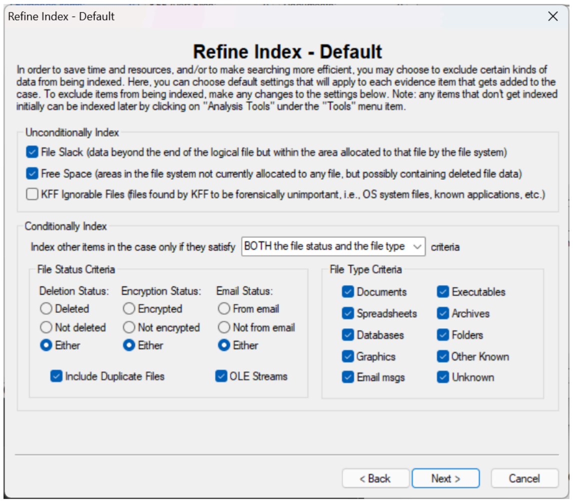
File Status Criteria

Deletion Status:	Encryption Status:	Email Status:
○ Deleted	○ Encrypted	○ From email
○ Not deleted	○ Not encrypted	○ Not from email
● Either	● Either	● Either

☑ Include Duplicate Files ☑ OLE Streams

File Type Criteria

☑ Documents	☑ Executables
☑ Spreadsheets	☑ Archives
☑ Databases	☑ Folders
☑ Graphics	☑ Other Known
☑ Email msgs	☑ Unknown



Refine Index - Default

In order to save time and resources, and/or to make searching more efficient, you may choose to exclude certain kinds of data from being indexed. Here, you can choose default settings that will apply to each evidence item that gets added to the case. To exclude items from being indexed, make any changes to the settings below. Note: any items that don't get indexed initially can be indexed later by clicking on "Analysis Tools" under the "Tools" menu item.

Unconditionally Index
- ☑ File Slack (data beyond the end of the logical file but within the area allocated to that file by the file system)
- ☑ Free Space (areas in the file system not currently allocated to any file, but possibly containing deleted file data)
- □ KFF Ignorable Files (files found by KFF to be forensically unimportant, i.e., OS system files, known applications, etc.)

Conditionally Index

Index other items in the case only if they satisfy [BOTH the file status and the file type] criteria

File Status Criteria

Deletion Status:	Encryption Status:	Email Status:
○ Deleted	○ Encrypted	○ From email
○ Not deleted	○ Not encrypted	○ Not from email
● Either	● Either	● Either

☑ Include Duplicate Files ☑ OLE Streams

File Type Criteria

☑ Documents	☑ Executables
☑ Spreadsheets	☑ Archives
☑ Databases	☑ Folders
☑ Graphics	☑ Other Known
☑ Email msgs	☑ Unknown

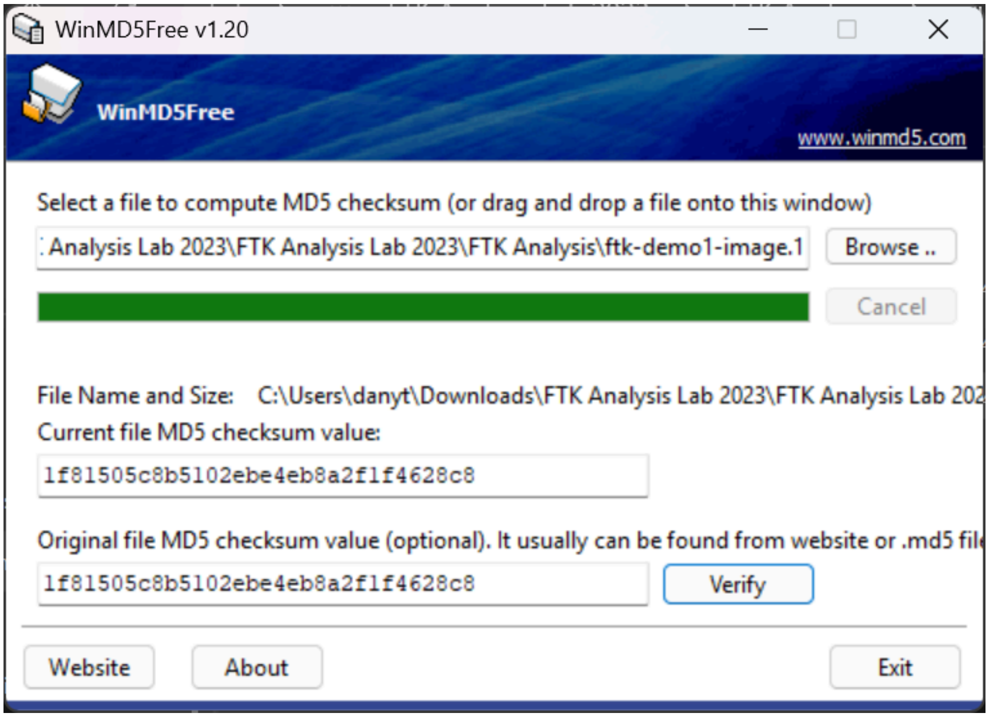
1. **What are the options for excluding certain kinds of data?**
   - File Slack: Data beyond the end of a logical file but still within the allocated cluster.
   - Free Space: Unallocated areas of the file system that may still contain deleted data.
   - KFF Ignorable Files: Files identified by the Known File Filter as forensically unimportant (e.g., system or common application files).
   - Conditional filters:
     - File Status (deleted, encrypted, email-related).
     - File Type (documents, graphics, executables, archives, etc.).
     - Duplicate files (optionally include or exclude duplicates).

2. **What is the difference Slack Space and Free Space? Expand your answer with additional research.**
   Slack space exists within allocated clusters of existing files, while free space consists of unallocated clusters that can still hold recoverable deleted data.

Aspect	**Slack Space**	**Free Space**
Definition	The unused area within an allocated cluster after the end of a file's actual data	Disk space not currently assigned to any file or folder
Location	Inside the last cluster of an existing file	Outside of allocated files – part of unallocated disk area
Created When	A file does not completely fill its last cluster (e.g., file size = 6 KB, cluster size = 8 KB → 2 KB slack)	Files are deleted, partitions formatted, or space never used
Contents	May contain fragments of old data from previously stored files	May contain full deleted files or remnants of earlier data
Forensic Value	Useful for finding hidden data fragments inside active files	Useful for data carving and recovering entire deleted files

3. **What utility compares file hashes against a reference database to eliminate known files?**
   It matches the hash values of files in the case against a database of known good or known bad hashes to:
   - Automatically exclude common system files (known good).
   - Identify known illegal or malicious files (known bad).
4. **What is difference between File Status and File Type?**
   - File Status – Describes the current state or condition of a file within the file system. *(tells how the file exists)*
     - Deleted, Encrypted, From Email, etc.
   - File Type – Describes the kind or format of the file, determined by its content or extension. *(tells what the file is)*
     - Documents (.docx, .pdf), Executables (.exe), Archives (.zip), Graphics (.jpg)

4. Verify Data Integrity



Select a file to compute MD5 checksum (or drag and drop a file onto this window)

: Analysis Lab 2023\FTK Analysis Lab 2023\FTK Analysis\ftk-demo1-image.1

File Name and Size: C:\Users\danyt\Downloads\FTK Analysis Lab 2023\FTK Analysis Lab 202

Current file MD5 checksum value:

```
1f81505c8b5102ebe4eb8a2f1f4628c8
```

Original file MD5 checksum value (optional). It usually can be found from website or .md5 fil

```
1f81505c8b5102ebe4eb8a2f1f4628c8
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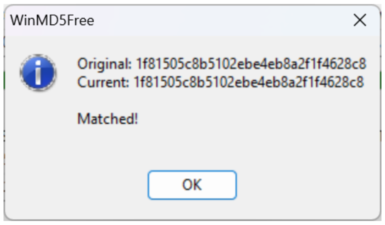

```
Original: 1f81505c8b5102ebe4eb8a2f1f4628c8
Current: 1f81505c8b5102ebe4eb8a2f1f4628c8

Matched!
```