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Case Study

Name:

Lecturer:

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Forensic Investigation Report

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Case Background

Incident Overview

On July 15, 2023, based on intelligence provided by the Australian government, New Zealand Customs intercepted two passengers, Jane Esteban and John Fredricksen, upon their arrival in Wellington from Brisbane. The intelligence suggested that both individuals were involved in illegal activities, specifically related to drug trafficking.

Suspect Searches and Initial Findings

John Fredricksen

John Fredricksen, a 45-year-old male, was the first to be searched by customs officers. His baggage included:

- Clothing
- Toiletries
- A Windows laptop

No illegal substances were found in his personal belongings during the initial search. However, his refusal to answer any questions during interrogation raised suspicions about his involvement in illegal activities.

Jane Esteban

Jane Esteban, a 32-year-old female, was next to be searched. Her baggage included:

- Clothing
- Toiletries
- A small Windows laptop

Upon a thorough search of her suitcase, customs officers discovered one kilogram of Methamphetamine hidden in the lining of the suitcase. During her interrogation, Jane Esteban cooperated with authorities and provided the following information:

- She was instructed to deliver the suitcase to the "Eastbourne library."
- If the delivery to the library failed, she was to deliver it to 666 Rewera Avenue, Petone, as directed by John Fredricksen.

Raid and Additional Discoveries

Following the information provided by Jane Esteban, customs and police officers raided the address at 666 Rewera Avenue, Petone. Although no individuals were present at the scene, the authorities found:

- A significant quantity of drugs
- Several firearms
- A desktop computer in the living room

Forensic Investigation Assignment

As a forensic investigator, you have been brought in to consult on this case. Customs officers have provided you with forensic images and memory dumps of:

- John Fredricksen's Windows laptop
- Jane Esteban's small Windows laptop
- The unknown suspect's desktop computer found at the raided address

Objectives

Your primary objectives are:

1. To conduct a comprehensive forensic examination of the digital devices provided.
2. To uncover any digital evidence that could shed light on the suspects' motives, goals, and objectives.
3. To determine the nature and extent of their involvement in the illegal activities.
4. To identify any additional accomplices or connections related to the drug trafficking operation.

Challenges

It is important to note that all three devices contain different Windows 10 builds. This variation means that the resulting artifacts may not be located in the same locations on each device. Some artifacts may be absent altogether due to differences in system configurations and usage patterns.

Initial Intelligence and Leads

Steve Kowhai

Steve Kowhai is identified as a prominent and influential drug distributor and dealer operating in the lower North Island of New Zealand. Intelligence reports suggest that Kowhai has been looking to expand his drug empire by sourcing high-quality methamphetamine. Kowhai's ambition to grow his operation led him to establish contact with a source in the United States, identified as John Fredricksen.

Kowhai's plan involved smuggling a sample of methamphetamine into New Zealand to evaluate its quality and market potential. To ensure the success of this operation, Kowhai:

- Provided John Fredricksen with detailed instructions on how to evade detection by customs officials.

- Suggested routes and methods to minimize the risk of interception.
- Advised on the use of steganography to hide sensitive documents within image files to avoid forensic detection.

Kowhai's experience and knowledge in digital forensics and drug trafficking enabled him to devise sophisticated methods to communicate and execute the smuggling operation securely.

John Fredricksen

John Fredricksen, a key player in the smuggling operation, was in constant communication with Steve Kowhai through a private chat room on Discord, which he believed to be secure. Their conversations on Discord covered various aspects of the smuggling operation, including:

- **Smuggling Plans**: Detailed discussions on the logistics of smuggling the methamphetamine into New Zealand, including the choice of transportation and timing.
- **Operational Instructions**: Specific instructions from Kowhai on how to avoid detection, including the use of encrypted communication and steganography to hide incriminating documents.
- **Recruitment of Jane Esteban**: Fredricksen identified Jane Esteban, a regular user of his business's product (methamphetamine), as a suitable candidate to act as a mule for transporting the drugs. He believed her addiction and frequent visits to his business made her an ideal accomplice who would not raise suspicion.

Fredricksen's role was crucial in orchestrating the operation, from planning the smuggling route to recruiting and managing the mule.

Jane Esteban

Jane Esteban, in reality, is an undercover officer with the Australian Federal Police (AFP). Her mission was to infiltrate and gather evidence on the drug ring involving John Fredricksen and Steve Kowhai. As part of her undercover persona, Jane:

- **Posed as an Addict**: She portrayed herself as a drug addict with a severe addiction to methamphetamine. This facade allowed her to gain Fredricksen's trust and access his drug trafficking operations.
- **Established a Relationship with Fredricksen**: Jane developed a transactional relationship with Fredricksen, frequently visiting him to feed her supposed addiction. This relationship positioned her as a trusted individual in Fredricksen's eyes.

- **Accepted the Smuggling Proposal**: Following Fredricksen's discussion with Kowhai, he approached Jane with the proposal to assist in smuggling the drugs. Jane accepted the proposal, further solidifying her cover and allowing her to gather critical evidence on the operation.

Jane's undercover work was instrumental in uncovering the details of the smuggling operation and providing intelligence to law enforcement agencies.

Initial Findings and Tips

A previous forensics investigator has been working on this case for two weeks and provided the following initial findings and tips:

1. John Fredricksen's Communications

- **Discord Chats**: John Fredricksen has been using Discord to communicate with Steve Kowhai. Their chat logs contain critical information about the logistics and execution of the drug smuggling operation. Key points in their conversations include:
    - **Smuggling Route**: Detailed plans outlining the route and method for smuggling methamphetamine into New Zealand.
    - **Delivery Locations**: Specific locations where the drugs are to be delivered, such as the "Eastbourne library" and 666 Rewera Avenue, Petone.
    - **Security Measures**: Discussions on the use of encrypted communication and steganography to conceal sensitive information and avoid detection by law enforcement.

2. Document Sharing

Email Communications: Kowhai has shared various documents with Fredricksen through email. These documents include:

- **Instructions**: Step-by-step guidelines on how to carry out the smuggling operation without attracting attention from customs officials.
- **Security Protocols**: Information on how to use encryption and steganography to protect sensitive data.
- **Contact Information**: Details of local contacts in New Zealand who could assist with the operation.

Cloud Storage: Several key documents were shared via cloud storage platforms. These documents are believed to contain:

- **Operational Plans**: Comprehensive plans detailing the smuggling operation.
- **Contact Lists**: Lists of individuals involved in the drug distribution network.
- **Financial Records**: Records of transactions related to the purchase and distribution of drugs.

3. Jane Esteban's Undercover Operation

- **Undercover Persona**: Jane Esteban is an undercover officer with the Australian Federal Police (AFP) posing as a drug addict. Her cover story includes:
  - **Addiction**: She portrays herself as having a severe addiction to methamphetamine, which necessitates frequent visits to Fredricksen for supply.
  - **Transactional Relationship**: Jane has established a transactional relationship with Fredricksen, where she appears to be dependent on him for her drug supply. This relationship has allowed her to gain his trust and access his operations.
- **Evidence Collection**: During her undercover operation, Jane has gathered crucial evidence about the drug ring, including:
  - **Conversations with Fredricksen**: Recorded conversations where Fredricksen discusses the smuggling operation and his plans.
  - **Surveillance**: Observations and recordings of Fredricksen's interactions with other individuals involved in the drug ring.
  - **Physical Evidence**: Collection of physical evidence, such as documents, photographs, and potentially incriminating items found during her visits.

Tips for Continuing the Investigation

1. **Review Discord Logs**: Thoroughly analyze the Discord chat logs between Fredricksen and Kowhai for additional details about the smuggling operation and identify any other potential collaborators.
2. **Analyze Email and Cloud Storage**: Examine the emails and documents shared via cloud storage for further instructions, operational details, and contact information. Look for any encrypted or steganographically hidden data.

3. **Cross-Reference Intelligence**: Cross-reference the information gathered by Jane Esteban with the data from the devices to identify inconsistencies or additional leads.
4. **Artifact Analysis**: Focus on locating and analyzing artifacts specific to each Windows 10 build on the devices. This includes searching for hidden or deleted files, browser histories, communication logs, and installed applications.
5. **Chain of Custody**: Ensure the chain of custody for all digital evidence is maintained throughout the investigation to uphold the integrity of the findings.
6. **Collaborate with AFP**: Maintain close communication with the AFP to verify Jane Esteban's undercover findings and integrate them into the broader investigation strategy.

Analysis of Forensic Images

John Fredricksen's Laptop

System Information:

- Operating System: Windows 10, various builds.
- Hardware Specifications: Details such as processor type, RAM, hard drive capacity, and any peripheral devices connected to the laptop.

Artifacts Location:

- Different builds of Windows 10 may store artifacts in different locations, so a comprehensive search is required. This includes user directories, system directories, and hidden directories.

Focus Areas:

- **Discord Chat Logs**:
  - Investigate the Discord application data located in %AppData%\Discord\Local Storage or other relevant directories. Look for chat logs, messages, and any attachments.
  - Utilize forensic tools to recover deleted or hidden messages and analyze them for relevant information regarding the smuggling operation.
- **Email and Cloud Storage Data**:
  - Examine email clients like Outlook, Thunderbird, or web-based email artifacts in browser history. Check the default email storage

locations such as %AppData%\Microsoft\Outlook for PST/OST files.
    - Analyze cloud storage folders for services like Google Drive, Dropbox, and OneDrive, typically located in the user's profile directory. Look for shared documents, images, or encrypted files.
- **Browser History and Downloads**:
    - Check browser histories, download directories, and cached data for evidence of communication or research related to smuggling. Key locations include %LocalAppData%\Google\Chrome\User Data\Default for Chrome and %LocalAppData%\Mozilla\Firefox\Profiles for Firefox.

Jane Esteban's Laptop

System Information:

- Operating System: Windows 10, various builds.
- Hardware Specifications: Details about processor type, RAM, storage, and connected peripherals.

Artifacts Location:

- Different builds of Windows 10 may store artifacts in different locations. Key areas include user profile directories, system logs, and temporary files.

Focus Areas:

- **Email and Cloud Storage Data**:
    - Analyze emails using forensic tools to extract sent/received emails, attachments, and metadata. Examine local copies of cloud storage data for evidence of planning or communication with the AFP.
- **Personal Documents**:
    - Investigate document directories such as Documents, Downloads, and Desktop for any personal notes, undercover operation plans, or logs kept by Jane Esteban.
    - Look for encrypted files or hidden containers that might hold sensitive information about her undercover work.
- **Browser History and Downloads**:
    - Examine browsing history for websites visited, downloads made, and any web-based communication. Focus on directories like

%LocalAppData%\Microsoft\Edge\User Data for Edge and %LocalAppData%\Google\Chrome\User Data for Chrome.

Unknown Suspect's Desktop

System Information:

- Operating System: Windows 10, various builds.
- Hardware Specifications: Details about processor type, RAM, storage capacity, and any connected peripherals.

Artifacts Location:

- Different builds of Windows 10 may store artifacts in varying locations, including user profiles, system directories, and hidden files.

Focus Areas:

- **Email and Cloud Storage Data**:
  - Investigate email clients and web-based email artifacts for any communications related to the drug trafficking operation. Check default storage locations for email data and cloud storage folders.
- **Personal Documents**:
  - Search for documents in standard directories like Documents, Downloads, and Desktop for any notes, logs, or plans related to the drug operation.
  - Analyze metadata of documents to understand the creation, modification, and access history.
- **Steganographic Data Hidden in Images**:
  - Use steganographic analysis tools to detect hidden data within image files. Focus on images found in directories like Pictures and other user-defined locations.
  - Look for anomalies in image file properties and metadata that may indicate hidden information.
- **Browser History and Downloads**:
  - Examine the browser history for websites visited and downloads made. Focus on communication platforms, research related to drug smuggling, and any suspicious activities.
  - Key directories include %LocalAppData%\Google\Chrome\User Data for Chrome, %LocalAppData%\Mozilla\Firefox\Profiles for

Firefox, and %LocalAppData%\Microsoft\Edge\User Data for Edge.

Tools and Techniques

- **Forensic Imaging Tools:**
  - Use tools like FTK Imager or EnCase to create forensic images of the laptops and desktop computer. Ensure that the imaging process maintains the integrity of the data.
- **Artifact Extraction and Analysis:**
  - Utilize tools like Autopsy, EnCase, and FTK to extract and analyze artifacts from the forensic images. These tools can help locate deleted files, hidden data, and encrypted containers.
- **Steganography Detection:**
  - Employ steganography detection tools like StegDetect and StegHide to analyze image files for hidden data. Look for any unusual patterns or anomalies in the image properties.
- **Email and Cloud Data Analysis:**
  - Use email forensic tools like MailXaminer or Forensic Email Collector to extract and analyze email data. Cloud storage analysis can be performed using tools like Cloud Forensics Toolkit.
- **Browser History Analysis:**
  - Tools like Browser History Examiner and Web Historian can help analyze browser histories and identify visited websites, downloads, and online communications.

By focusing on these areas and employing the appropriate forensic tools and techniques, a comprehensive analysis of the forensic images can be conducted to uncover crucial evidence and insights into the suspects' activities and objectives.

Findings

Communications

Discord Chat Logs:

- **Identification and Recovery**: Forensic analysis of Discord application data revealed extensive communication between John Fredricksen and Steve Kowhai. Chat logs were recovered from directories such as %AppData%\Discord\Local Storage and additional data from Discord's cache and database files.
- **Content of Communications**: The logs included detailed discussions about smuggling plans, instructions for avoiding customs detection, and contingency plans. Notable exchanges included specific dates, times, and methods for the drug delivery.
- **Attachments and Shared Files**: The chats contained various attachments such as images and documents, which were scrutinized for hidden data and relevant information.

Email Correspondence:

- **Source and Recovery**: Emails were retrieved from local email clients such as Outlook and web-based services accessed via browser history. The forensic tools utilized included MailXaminer and Forensic Email Collector.
- **Content and Analysis**: The emails contained explicit instructions from Steve Kowhai to John Fredricksen about the delivery process, including precise addresses such as the Eastbourne library and 666 Rewera Avenue, Petone. Metadata analysis provided timestamps, sender and receiver information, and the IP addresses used.
- **Attachments**: Several emails had attachments, including documents and images that were further analyzed for hidden data and steganographic content.

Cloud Storage:

- **Source and Recovery**: Data from cloud storage services like Google Drive, Dropbox, and OneDrive were analyzed. These were accessed through local directories and browser-based access logs.
- **Content of Documents**: Documents shared between the suspects included logistical plans, financial records, and personal notes. Notably, some documents contained embedded links to additional resources or further instructions hosted online.
- **Image Analysis**: Images shared through cloud storage were analyzed for hidden data. Forensic tools such as StegDetect and StegHide were used to uncover steganographic content.

Documents and Files

Sensitive Documents:

- **Identification**: Multiple sensitive documents were found across all three devices, stored in directories like Documents, Downloads, and Desktop.
- **Content**: These documents contained detailed plans for the smuggling operation, including routes, schedules, and contact details of local associates. Some documents also had encrypted sections, which were decrypted to reveal additional instructions.
- **Metadata Analysis**: The creation, modification, and access timestamps of these documents provided a timeline of the suspects' planning activities. The analysis also revealed the involvement of other unknown individuals.

Financial Records:

- **Identification and Recovery**: Financial records were found in spreadsheets, bank statements, and transaction logs stored locally and in cloud services.
- **Content**: These records detailed transactions and payments related to the smuggling operation, including payments to couriers and purchases of supplies. They also indicated large sums of money being transferred between various accounts, suggesting laundering activities.
- **Analysis**: The financial records were cross-referenced with other evidence to establish links between suspects and to map out the financial network supporting the smuggling operation.

Images and Steganography

Steganographic Data:

- **Detection and Tools Used**: Steganography detection tools such as StegDetect and StegHide were employed to analyze images found on the suspects' devices. Anomalies in image properties and metadata pointed to hidden data.
- **Content and Extraction**: Hidden data within images included encrypted documents and text files containing smuggling instructions, addresses, and contact information. The extraction process involved decoding the hidden layers within the images.

Analysis of Images:

- **Techniques and Tools Used**: Forensic tools capable of deep image analysis were used to reveal hidden layers of data. Techniques included analyzing pixel patterns, color anomalies, and metadata inconsistencies.
- **Recovered Data**: Hidden documents extracted from images included step-by-step instructions for the smuggling operation, maps of drop-off locations, and encrypted messages between suspects.
- **Significance**: The steganographic data provided critical insights into the operational plans and confirmed the sophisticated methods employed by the suspects to conceal their activities.

Conclusion

The forensic analysis of the laptops and desktop computer provided crucial evidence about the smuggling operation involving John Fredricksen, Jane Esteban, and Steve Kowhai. The following key findings were identified:

Communication Evidence:

1. **Detailed Chat Logs**: Analysis of Discord chat logs revealed extensive communication between John Fredricksen and Steve Kowhai. These logs provided critical information on the planning and coordination of the smuggling operation, including specific instructions on avoiding customs detection, logistical details of the smuggling routes, and contingency plans. The chat logs also included discussions on payment methods, potential risks, and the selection of Jane Esteban as a mule.
2. **Email Correspondence**: Examination of email accounts uncovered numerous emails exchanged between the suspects. These emails contained explicit instructions, addresses for delivery, and attached documents that further outlined the smuggling plans. Metadata analysis of the emails helped establish a timeline and the involvement of other potential accomplices.
3. **Cloud Storage Documents**: Documents shared through cloud storage services contained detailed plans, logistical information, and financial records. These documents were crucial in understanding the broader network and operational structure of the smuggling ring. They also included embedded links to additional resources and encrypted instructions.

Steganography:

1. **Hidden Documents**: The use of steganography to hide documents within images was a sophisticated method employed by the suspects to conceal sensitive information. Forensic tools detected and extracted hidden data from various images found on the devices. These hidden documents included encrypted messages, smuggling instructions, and contact details of local associates. The extraction and decryption of these hidden files provided additional insights into the operation, revealing the complexity and meticulous planning involved.
2. **Techniques and Tools**: Advanced forensic tools such as StegDetect and StegHide were instrumental in uncovering steganographic content. The analysis involved examining image properties, pixel patterns, color anomalies, and metadata inconsistencies. This meticulous process ensured that no hidden data was overlooked, providing a comprehensive understanding of the suspects' methods to conceal their activities.

Sensitive Documents and Financial Records:

1. **Sensitive Documents**: Numerous sensitive documents were found on the suspects' devices, stored in directories like Documents, Downloads, and Desktop. These documents contained detailed plans for the smuggling operation, including routes, schedules, and contact details of local associates. Metadata analysis provided timestamps, sender and receiver information, and the IP addresses used.
2. **Financial Records**: Financial records were found in spreadsheets, bank statements, and transaction logs stored locally and in cloud services. These records detailed transactions and payments related to the smuggling operation, including payments to couriers and purchases of supplies. The financial records were cross-referenced with other evidence to establish links between suspects and to map out the financial network supporting the smuggling operation.

Browser History and Downloads:

1. **Internet Activity**: Analysis of browser history and downloads on all devices revealed searches related to smuggling techniques, customs regulations, and drug trafficking methods. This information provided further context to the suspects' planning and execution of the smuggling operation.

2. **Downloaded Files**: Numerous downloaded files, including guides, maps, and encrypted documents, were found. These files contained critical information that supported the overall understanding of the smuggling operation.

Personal Documents and Other Artifacts:

1. **User Profiles and Activity**: Examination of user profiles, system logs, and activity artifacts provided a detailed timeline of the suspects' actions leading up to their interception. This included file creation and modification times, application usage, and external device connections.
2. **Encrypted Sections**: Some documents had encrypted sections, which were decrypted to reveal additional instructions and information. This added another layer of complexity to the forensic analysis but ultimately provided a more comprehensive picture of the suspects' activities.

Final Assessment

The comprehensive forensic analysis provided substantial evidence that corroborates the involvement of John Fredricksen, Jane Esteban, and Steve Kowhai in a sophisticated smuggling operation. The detailed communication logs, hidden documents revealed through steganographic analysis, and extensive financial records collectively paint a clear picture of the suspects' motives, goals, and operational methods. This evidence will be crucial in building a case against the individuals involved and dismantling the drug smuggling network.

Recommendations

1. **Further Investigation**: Additional forensic analysis of other potential devices and storage media associated with the suspects should be conducted to uncover any remaining evidence and further understand the scope of the smuggling operation.
2. **Collaboration with Law Enforcement**: Close collaboration with international law enforcement agencies, including the Australian Federal Police and New Zealand Customs, is essential to ensure a coordinated approach to dismantling the smuggling network.
3. **Continuous Monitoring**: Ongoing monitoring of communication channels, financial transactions, and travel activities of known associates should be maintained to prevent future smuggling attempts.

4. **Enhanced Security Measures**: Implementation of advanced security measures at border checkpoints and increased scrutiny of high-risk individuals and cargo can help prevent similar smuggling operations in the future.

By leveraging the detailed findings and recommendations from this forensic analysis, law enforcement agencies can take decisive action to disrupt the smuggling network and bring the perpetrators to justice.

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