Quick Start Guide For Populating Test Devices

# Introduction

There are two strategies for populating test devices: 1) populate a new or previously sanitized device or 2) start with a used device and add content as needed. This guide first describes the major data types and how to populate them onto the test device. [Appendix A](#_Appendix_A_–_3) is both a template that should be filled out for each device to document the device’s content prior to testing and a specification of properties that each data element should meet. This “ground truth” provides the “expected results” for checking the ability of the tool being tested to obtain all of the device’s contents. [Appendix B](#_Appendix_B_–_2) is a sample of a template filled out with appropriate data elements.

This guide will step you through populating and documenting your test devices. This needs to be done for each mobile device. You should select data types that are relevant to the cases seen in your lab. You do not need to include all of the data types. You can include other relevant data types by adding a section to [Appendix A](#Appendix A – Mobile Device Data Documentation).

Used devices may include numerous data elements (e.g., contact entries, call logs, text messages, pictures, etc.). While a device may contain hundreds of a specific data type (e.g., contact entries), users should concentrate on documenting a representative portion of data elements with the required data properties relevant to testing within [Appendix A](#Appendix A – Mobile Device Data Documentation). You only need to populate data where the data element does not already exist.

The guide is divided into the following sections and appendices describing how to document/populate data for a mobile device and a SIM/UICC:

* Section 1: Document Device Data
* Section 2: Personal Information Management (PIM) Data: Contacts, Calendar & Memos
* Section 3: Stand-alone Data Files
* Section 4: Call Logs
* Section 5: Text Messages
* Section 6: MMS Messages
* Section 7: Location Data
* Section 8: Browser/Email Data
* Section 9: Social Media Data
* Section 10: Other Applications of Interest
* Section 11: SIM/UICC Card
* [Appendix A](#_Appendix_A_–_2): Mobile Device Data Documentation - provides users with guidance on specific data properties for each data element type and a blank template to be used to document target mobile devices and/or SIM/UICC data.
* [Appendix B](#_Appendix_B_–_1): Mobile Device Data Example - offers example data values that may be used to populate a target mobile device and/or SIM/UICC.

*NOTE: The status of data populated onto a mobile device and/or a SIM/UICC may either be classified as Active or Deleted. Deleted data objects may be recovered by a mobile forensic tool if they are not overwritten. To prevent overwriting of data objects that are intended to be recovered, do NOT delete data objects populated onto a mobile devie and/or SIM/UICC until data population has been completed.*

For a more in-depth view on data population refer to CFTT’s [Mobile Device Data Population Setup Guide](http://www.cftt.nist.gov/documents/Mobile%20Device%20Data%20Population%20Setup%20Guide.pdf).

# Document Device Data

Document the equipment (i.e., IMEI) and subscriber (i.e., MSISDN/phone number) data by navigating to the mobile device *Settings* menu. The *Settings* menu is often identified by a gear shaped icon. Equipment and subscriber data may be in a subfolder such as *General* or *About Phone*.

***Note: For mobile devices that allow for easy battery removal - the IMEI is also commonly located on a sticker within the battery cavity beneath the battery. For some makes/models of mobile devices the IMEI can be retrieved by entering: \*#06# on the keypad.***

Document Device Data in [Appendix A](#_Appendix_A_–).

# Personal Information Management (PIM) Data: Contacts, Calendar & Memos

Populating PIM data onto a mobile device does not require an active cellular subscription. Although, if network connectivity can be established, synchronization of supported data elements with an email account speeds up this process.

Different methods exist for data population, such as manual input or synchronization with an email account.

Synchronizing data from an existing email account to a mobile device requires network connectivity. Support for this method will vary based on make/model of the device.

***Note: Synchronization of Contacts, Calendar and Memos with an existing email account may be accomplished by enabling specific data types within the mobile devices email client settings. Once this data is enabled, and the email account is accessed from the mobile device, the sync process should occur. It is recommended to set up a unique email account designed specifically for data synchronization.***

***Note: Non-Latin text (Non-English, e.g., Chinese, Arabic, Russian, etc.) can be readily created with language translation tools from a web-browser and then copied and pasted.***

Document the PIM data in [Appendix A](#_Appendix_A_–).

# Stand-alone Data Files

Stand-alone data files (e.g., audio, graphic, video) can be populated onto a mobile device using its native applications (i.e., camera, microphone).

***Note: If the mobile device has network connectivity, stand-alone files (audio, graphic, video, documents, etc.) may be populated onto the target mobile device by downloading them from an email account.***

Document Stand-alone Data Files in [Appendix A](#_Appendix_A_–).

# Call Logs

When populating mobile devices with call log data, it is useful to obtain two devices. A sending device, and a target device. Missed calls are populated onto the target device by placing a call from a sending device and not answering from the target device. Incoming calls are populated by answering the call from the target device and documenting the date/time and the duration of the call. Outgoing calls are placed from the target device to secondary lines.

Document Call Logs in [Appendix A](#_Appendix_A_–).

# Text Messages

Populating mobile devices with text messages requires two mobile devices. A sending device, and a target device. Text messages may be categorized as either Short Messages Service (SMS) or Enhanced Message Service (EMS) messages.

SMS messages are soley textual based messages containing less than 160 characters. EMS messages are an extension of SMS and support text messages over 160 characters.

Incoming messages are populated onto the target device by sending the message from a sending device. Outgoing messages are populated by sending a message from the target device to a secondary device.

In addition to the text message, document phone numbers, date/time, and the status (i.e., read, unread, deleted).

***Note: Text messages are categorized with a status of either: Read, Unread, or Deleted. To establish messages with a status of read, open and observe the message on the screen. Messages with a status of Unread are accomplished by not reading/opening the message. Messages with a status of Deleted are accomplished by deleting a specific message after the phone has been entirely populated.***

Document Text Messages in [Appendix A](#_Appendix_A_–).

# MMS Messages

MMS messages are populated onto the target device similar to text messages as described above in Section 5. MMS messages contain either an audio, graphic or a video attachment - with or without a text message.

Incoming MMS messages are populated onto the target device by sending MMS (audio, graphic, video) messages from a sending device. Outgoing MMS messages can be created using native applications (i.e., camera, microphone) and populated by sending a message from the target device to a secondary device. In addition to the text message, document phone numbers, date/time, and the status (i.e., read, unread, deleted).

***Note: MMS messages are categorized with a status of either: Read or Unread. To establish messages with a status of read, open and observe the message on the screen. Messages with a status of Unread are accomplished by not reading/opening the message. Messages with a status of Deleted are accomplished by deleting a specific message after the phone has been entirely populated.***

Document MMS Messages in [Appendix A](#_Appendix_A_–).

# Location Data

Location related data is populated onto a mobile device by enabling location services. Initiate a GPS related application from the target device, enter a destination and begin the route.

Pictures and videos may also contain location related data. The mobile device’s camera security settings will determine if this feature is supported. For devices supporting “geotagged” pictures and video, populate the target device by taking photographs and video while documenting the location.

Document Location Data in [Appendix A](#_Appendix_A_–).

# Browser/Email Data

Internet related data may be populated onto mobile devices by opening a browser on the device (e.g., Chrome, Safari). The following data elements: Internet history, bookmarks are populated onto the target device by visiting and bookmarking selected URLs.

Email related data may be populated onto supported devices by opening an email client and sending/receiving emails to/from the device.

Document Browser/Email Data in [Appendix A](#_Appendix_A_–).

# Social Media Data

Mobile devices support a variety of social media applications such as: Facebook, LinkedIn, Twitter, and Instagram.

Individual social media accounts can be created from either a personal computer or mobile device with network connectivity. It is recommended to create two social media accounts (e.g., mobile\_1, mobile\_2). Creating two accounts provides the user with the ability to populate the target device with dialogue such as personal messages (PMs) between the two accounts. In addition to PMs; faux profile information (e.g., high school, college, employer, current city, hometown), picture albums, status updates, profile pictures, video, etc. should be created by accessing both accounts (for each social media app) on the target device.

Available features of each social media application will vary. Typically, applications provide users with the ability to create a profile (picture, background information, etc.) of the account and to share status information that may or may not include: pictures, video or audio files.

Document Social Media Data in [Appendix A](#_Appendix_A_–).

# Other Applications of Interest

Other types of application related data (not covered in sections 1 - 9) may be populated to a mobile device (e.g., reminders, wallet, cloud storage, productivity, organization, etc.). Consider populating a mobile device with application data critical to your casework. Selection of apps should focus on ones that are not covered in previous sections.

Document Other Applications of Interest in [Appendix A](#_Appendix_A_–).

# SIM/UICC Card

The make and model of a mobile device determines if data i.e., Contacts/Abbreviated Dialling Numbers (ADN), Last Numbers Dialled (LND) and text (SMS, EMS) messages may be stored on a SIM/UICC. Newer devices typically store this information within the mobile device internal memory.

If the target device has a SIM/UICC card capable of storing ADNs, LNDs, SMS, EMS data; manually populate the SIM/UICC by performing the following:

1. Export Contact information from the internal memory of the device to the SIM/UICC. This typically is done by clicking on a Contact/Address book entry and selecting copy/export and selecting the SIM as the location.
2. LNDs – place outgoing calls from the target device.
3. Incoming text messages (SMS, EMS) – send messages from a secondary device to the target device.

***Note: Document subscriber and equipment related data (e.g., ICCID, IMSI) after successfully acquiring the contents of the target SIM/UICC.***

Document SIM/UICC Card in [Appendix A](#_Appendix_A_–).

# Appendix A – Mobile Device Data Documentation

Appendix A provides the user with the ability to document data contained on a mobile device and/or SIM/UICC. To record each mobile device a separate appendix A should be used each time.

*Note: If the following tables do not contain grid-lines, highlight the individual table, select Borders and Shading and add the grid-lines.*

**Equipment and Subscriber-related data:**

|  |  |
| --- | --- |
| **Data Element** | **Data Value** |
| Device Make/Model |  |
| IMEI/MEID/ESN |  |
| MSISDN / MIN |  |

**PIM data:**

| **Data Objects** | **Data Properties** | **Data Value** |
| --- | --- | --- |
| Contacts/Address Book Entries | Regular length (up to 50 chars) |  |
| Maximum length  (over 50 chars) |  |
| Special character  (!, @, #, $, %, ^, &, \*) |  |
| Blank name |  |
| Regular length with multiple metadata objects (e.g., graphic, email, URL, Address, Birthday) supported by the device |  |
| Non-Latin entry |  |
| Contact groups |  |
| Deleted entry |  |
| Calendar data | Regular length entry  (up to 50 chars) |  |
| Maximum length entry (100+ characters) |  |
| Special character entry |  |
| Blank title entry |  |
| Deleted entry |  |
| Memo data | Regular length entry (100 characters or less) |  |
| Maximum length entry (1000 characters+) |  |
| Deleted entry (100-1000 characters) |  |

**Stand-alone data files:**

| **Data Objects** | **Data Properties** | **Data description/contents** |
| --- | --- | --- |
| Stand-alone files | Audio | mp3 |
| wav |
| ogg |
| wma |
| Graphic | bmp |
| gif |
| jpg |
| png |
| Video | avi |
| flv |
| mov |
| mp4 |
| Documents | txt |
| doc |
| pdf |
| ppt |
|  | Audio – Deleted |  |
|  | Graphic – Deleted |  |
|  | Video – Deleted |  |
|  | Documents – Deleted |  |

**Call Log data:**

| **Data Objects** | **Data Properties** | **Data Value/Date/Time/Duration** |
| --- | --- | --- |
| Call Logs | Incoming Calls |  |
|  |
|  |
| Outgoing Calls |  |
|  |
|  |
| Missed Calls |  |
|  |
|  |
| Incoming – Deleted |  |
| Outgoing – Deleted |  |
| Missed – Deleted |  |

**Text Messages:**

| **Data Objects** | **Data Properties** | **Data Value/Sender/Receiver phone number/Date/Time** |
| --- | --- | --- |
| SMS/EMS Messages | Incoming SMS/Read |  |
| Incoming SMS/Unread |  |
| Incoming SMS/Deleted |  |
| Incoming EMS/Read (160 characters +) |  |
| Incoming EMS/Unread (160 characters +) |  |
| Incoming EMS/Deleted (160 characters +) |  |
| Outgoing SMS |  |
| Outgoing group SMS |  |
| Outgoing SMS/Deleted |  |
| Outgoing EMS (160 characters +) |  |
| Outgoing group EMS (160 characters +) |  |
| Outgoing  EMS/Deleted (160 characters +) |  |

**Multi-media Messges:**

| **Data Objects** | **Data Properties** | **Data Value/Sender/Receiver phone number/Date/Time** |
| --- | --- | --- |
| MMS Messages | Incoming audio MMS |  |
| Incoming graphic MMS |  |
| Incoming video MMS |  |
| Outgoing audio MMS |  |
| Outgoing graphic MMS |  |
| Outgoing video MMS |  |

**Location data:**

| **Data Objects** | **Data Properties** | **Data Value** |
| --- | --- | --- |
| Navigation | Waypoints (longitude/latitude) |  |
| Checking In (places of interest) |  |
| Pictures/Video (geotagged) |  |
| Trip (destination) |  |

**Browser/email data:**

| **Data Objects** | **Data Properties** | **Data Value** |
| --- | --- | --- |
| Bookmarks/History/Email | Visited Sites: |  |
| Bookmarked Sites: |  |
| Email data: |  |

**Social Media related data:**

| **Data Objects** | **Data Properties** | **Data Value** |
| --- | --- | --- |
| Profile information, Status updates, personal messages, etc. | Application 1, e.g., Facebook/Facebook messenger |  |
| Application 2, e.g., Twitter |  |
| Application 3, e.g., LinkedIn |  |
| Application 4, e.g., Instagram |  |

**Other applications of interest:**

|  |  |  |
| --- | --- | --- |
| **Data Objects** | **Data Properties** | **Data Value** |
| Application related data | Appication 1 (e.g., reminders) |  |
| Application 2 (e.g., Productivity) |  |
| Application 3 (e.g., Organization) |  |

**SIM/UICC data: (*Note – populating data onto SIM/UICCs is dependent upon the make and model of mobile device.)***

| **Data Element** | | **Data Value** |
| --- | --- | --- |
| ICCID | |  |
| Sevice Provider Name (SPN) | |  |
| IMSI | |  |
| MSISDN | |  |
| Abbreviated Dialing Numbers (ADNs) | Regular Length |  |
| Maximum Length |  |
| Special Character |  |
| Blank Name |  |
| Non-ASCII Entry |  |
| Last Numbers Dialed (LNDs) | |  |
| Incoming SMS Messages | Read |  |
| Unread |  |
| Non-ASCII |  |
| Deleted |  |
| Incoming EMS Messages (over 160 chars) | Read |  |
| Unread |  |
| Non-ASCII |  |
| Deleted |  |
| LOCI | |  |
| GPRSLOCI | |  |

# Appendix B – Mobile Device Data Example

Appendix B – contains an example/template of a dataset used for populating the internal memory and associated media i.e., SIM/UICC of a test device.

**PIM data:**

| **Data Objects** | **Data Properties** | **Data Value** |
| --- | --- | --- |
| Contacts/Address Book Entries | Regular length (up to 50 chars) | Eddie Van Halen, 5150515051 |
| Maximum length  (over 50 chars) | John Jacob Jingle Heimer Schmidt That’s My Name Too Whenever I Go Out The People Always Shout John Jacob Jingle Heimer Schmidt, 8988675309 |
| Special character  (!, @, #, $, %, ^, &, \*) | \*, 8887771212 |
| Blank name | 8785551111 |
| Regular length with multiple metadata objects (e.g., graphic, email, URL, Address, Birthdate) supported by the device. | Stevie Ray Vaughn, 1234567890, work: stevie@srv.com, address: 1234 Main Street, Dallas, TX, SRV Birthday: October 3, 1954 Stevie_Ray_Vaughan |
| Non-Latin entry | 阿恶哈拉, +86 35 8 763 30 07  Aurélien, +33 22 6 555 20 20 |
| Contact groups | 27 Club: Jimi Hendrix\*, Stevie Ray Vaughn\*, John Bonham |
| Deleted entry | John Bonham, 9878767654 |
| Calendar data | Regular length (up to 50 characters) | Date/Time: Location: Los Angeles Type: Meeting Title: Rush Concert |
| Maximum length entry (100+ characters) | Date/Time:  Type: Reminder Title: Van Halen were scheduled to perform forty shows on their 2007 tour with David Lee Roth after much success in the early 80s with David Lee Roth as their front man for Van Halen!! |
| Special character entry | Date/Time:  e.g.,!, @, #, $, %, ^, &, \* |
| Blank title entry | Date/Time:  Type: Reminder |
| Deleted entry | Date/Time:  Hendrix Summer of Love Documentary |
| Memo data | Regular length entry | (100 characters or less) |
| Long entry | (1000 characters +) |
| Deleted entry | (100 – 1000 characters) |

**Stand-alone data files:**

|  |  |  |
| --- | --- | --- |
| **Data Objects** | **Data Properties** | **Data Value** |
| Stand-alone files | Audio | *Supported audio files (e.g., mp3, wav, ogg, wma)* |
| Graphic | *Supported graphic files (e.g., bmp, gif, jpg, png)* |
| Video | *Supported video files (e.g., avi, flv, mov, mp4)* |
| Documents | *Supported document files (e.g., txt, doc, pdf, ppt)* |
|  | Audio – Deleted | *Deleted audio file* |
|  | Graphic – Deleted | *Deleted graphic file* |
|  | Video – Deleted | *Deleted video file* |
|  | Documents – Deleted | *Deleted document file* |

**Call Log data:**

| **Data Objects** | **Data Properties** | **Data Value/Date/Time/Duration** |
| --- | --- | --- |
| Call Logs | Incoming Calls | (301) 555-0101 / April 12, 2017 2:07pm / 10 minutes |
| (703) 555-0102 / April 12, 2017 2:20pm / Canceled call |
| (103) 555-0103 / April 12, 2017 2:21pm / 2 seconds |
| Outgoing Calls | (xxx) xxx-xxxx / April 12, 2017 2:25pm / 3 seconds |
| (xxx) xxx-xxxx / April 12, 2017 2:26pm / 2 minutes, 3 seconds |
| (xxx) xxx-xxxx / April 12, 2017 2:30pm / 10 seconds |
| Missed Calls | (xxx) xxx-xxxx / April 12, 2017 3:01pm |
| (xxx) xxx-xxxx / April 12, 2017 3:03pm |
| (xxx) xxx-xxxx / April 12, 2017 3:07pm |
| Incoming – Deleted | (103) 555-0103 / April 12, 2017 3:09pm / 2 seconds |
| Outgoing – Deleted | (xxx) xxx-xxxx / April 12, 2017 3:10pm / 3 seconds |
| Missed - Deleted | (xxx) xxx-xxxx / April 12, 2017 3:15pm |

**Text Messages:**

| **Data Objects** | **Data Properties** | **Data Value/Sender/Receiver phone number/Date/Time** |
| --- | --- | --- |
| SMS/EMS Messages | Incoming SMS/Read | The following SMS message is a read incoming message sent from another device / (301) 555-0102 / April 12, 2017 3:15pm |
| Incoming SMS/Unread | The following SMS message is an unread message sent from another device / (301) 555-0102 / April 12, 2017 3:16pm |
| Incoming SMS/Deleted | This is a deleted incoming message sent from another device / (301) 555-0102 / April 12, 2017 3:17pm |
| Incoming EMS/Read | Incoming read active extended SMS message. This is an incoming SMS message that exceeds 160 characters. This message will determine if the forensic application properly reports all characters contained in the message. / (301) 555-0102 / April 12, 2017 3:17pm |
| Incoming EMS/Unread | Incoming unread active extended SMS message. This is an incoming SMS message that exceeds 160 characters. This message will determine if the forensic application properly reports all characters contained in the message. (301) 555-0102 / April 12, 2017 3:18pm |
| Incoming EMS/Deleted | Incoming deleted extended SMS message. This is a deleted incoming SMS message sent from another device to determine if the forensic application has the ability to acquire and report deleted incoming SMS messages. / (301) 555-0102 / April 12, 2017 3:20pm |
| Outgoing SMS | The following SMS message is an active outgoing message sent to another device / (301) 555-0101 / April 12, 2017 3:20pm |
| Outgoing group SMS | The following SMS message is an active outgoing group message sent to multiple recipients / (301) 555-0101 and (301) 555-0102 / April 12, 2017 3:21pm |
| Outgoing SMS/Deleted | This is a deleted outgoing message sent to another device / (301) 555-0101 / April 12, 2017 3:21pm |
| Outgoing EMS | Outgoing active extended SMS message. This is an outgoing SMS message that exceeds 160 characters. This message will determine if the forensic application properly reports all characters contained in the message. / (301) 555-0101 / April 12, 2017 3:22pm |
| Outgoing group EMS | Outgoing active extended SMS message. This is an outgoing SMS message sent to multiple recipients that exceeds 160 characters. This message will determine if the forensic application properly reports all characters contained in the message. / (301) 555-0101 and (301) 555-0102 / April 12, 2017 3:23pm |
| Outgoing  EMS/ Deleted | Outgoing deleted extended SMS message. This is a deleted outgoing SMS message sent to another device to determine if the forensic application has the ability to acquire and report deleted outgoing SMS messages. / (301) 555-0101 / April 12, 2017 3:25pm |

**Multi-media Messges:**

| **Data Objects** | **Data Properties** | **Data Value/Sender/Receiver phone number/Date/Time** |
| --- | --- | --- |
| MMS Messages | Incoming audio MMS | Incoming sound byte message *attachment: audio file* / (301) 555-0101 / April 12, 2017 4:00pm |
| Incoming graphic MMS | Incoming graphic message *attachment: graphic file* / (301) 555-0101 / April 12, 2017 4:01pm |
| Incoming video MMS | Incoming video message *attachment: video file*  / (301) 555-0101 / April 12, 2017 4:03pm |
| Outgoing audio MMS | Outgoing sound byte message *attachment: audio file*  / (301) 555-0101 / April 12, 2017 4:07pm |
| Outgoing graphic MMS | Outgoing graphic message *attachment: graphic file*  / (301) 555-0101 / April 12, 2017 4:09pm |
| Outgoing video MMS | Outgoing video message *attachment: video file*  / (301) 555-0101 / April 12, 2017 4:12pm |

**Location data:**

|  |  |  |
| --- | --- | --- |
| **Data Objects** | **Data Properties** | **Data Value** |
| Navigation | Waypoints | *Longitude/Latitude coordinates* |
| Checking In | *Social media* |
| Pictures/Video | *Geotagged* |
| Trip | *Trip Advisor* |

**Browser/email data:**

|  |  |  |
| --- | --- | --- |
| **Data Objects** | **Data Properties** | **Data Value** |
| Bookmarks/History/Email | Visited Sites: | *History of various sites navigated to* |
| Bookmarked Sites: | *Active and deleted entries* |
| Email data: | *Cached data to the phone* |

**Social Media related data:**

| **Data Objects** | **Data Properties** | **Data Value** |
| --- | --- | --- |
| Profile information, Status updates, personal messages, etc. | Facebook/Facebook messenger | Profile related data (picture, bio), Status updates, personal messages, etc. |
| Twitter | Profile related data (picture, bio), Tweets, personal messages, etc. |
| LinkedIn | Profile related data (picture, bio), personal messages, etc. |
| Instagram | Profile related data (picture, bio), Posted pictures, videos, etc. |

**Other applications of interest:**

| **Data Objects** | **Data Properties** | **Data Value** |
| --- | --- | --- |
| Application related data | Appication 1 (e.g., reminders) |  |
| Application 2 (e.g., Productivity) |  |
| Application 3 (e.g., Organization) |  |

**SIM/UICC data: (*Note – populating data onto SIM/UICCs is dependent upon the make and model of mobile device.)***

| **Data Element** | **Data Value** |
| --- | --- |
| ICCID | *Documented from the SIM/UICC casing* |
| Sevice Provider Name (SPN) | *Documented from the phone provider* |
| IMSI | *Documented from the phone settings* |
| Abbreviated Dialing Numbers (ADNs) | *If supported by mobile device – export internal memory contacts to the SIM/UICC* |
| Last Numbers Dialed (LNDs) | (301) 555-0101  (703) 555-0102  (103) 555-0103  (401) 555-0104  (205) 555-0105  (207) 555-0106  (280) 555-0107  (109) 555-0108  (404) 555-0109  (616) 555 -0110 |
| Incoming SMS Messages | The following SMS message is a SMS message. |
| Incoming EMS Messages (over 160 chars) | This is an extended SMS message. Extended SMS messages referred to as EMS messages are messages that dexceeds 160 characters. This message will determine if the forensic application properly reports all characters contained in the message. |
| Non-ASCII SMS Messages | икра 古老肉 شیشلیک‎‎ Döner kebab sauté |
| LOCI | *Values are determined by location* |
| GPRSLOCI | *Values are determined by location* |