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Forensic Analysis of Signal Messenger on Android

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Abstract : The amount of people moving towards more privacy focused instant messaging applications has grown significantly. Signal is one of these instant messaging applications, which makes Signal interesting for digital investigators. In this research, we evaluate the artifacts that are generated by the Signal messenger for Android. This evaluation was done by using the features that Signal provides to create artifacts, whereafter, we made an image of the internal storage and the process memory. This image was analysed manually. The manual analysis revealed the content that Signal stores in different locations during its operation. From our research, we were able to identify the artifacts and interpret how they were used. We also examined the source code of Signal. Using our obtain knowledge from the source code, we developed a tool that decrypts some of the artifacts using the key stored in the Android Keystore. In general, we found that most artifacts are encrypted and encoded, even after decrypting some of the artifacts. During data visualization, some artifacts were found, such as that Signal does not use relationships between the data. In this research, two interesting groups of artifacts were identified, those related to the database and those stored in the process memory dump. In the database, we found plaintext private- and group chats, and in the memory dump, we were able to retrieve the plaintext access code to the application. Nevertheless, we conclude that Signal contains a wealth of artifacts that could be very valuable to a digital forensic investigation.

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