

C34 Vehicle Forensics: A Tale of Two Cars

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After attending this presentation, attendees will recognize the capabilities and potential for vehicle forensics to uncover valuable digital evidence. Attendees will also understand the basic capabilities of the only commercial vehicle forensics tool currently available.

This presentation will impact the forensic science community by demonstrating the ability of vehicle forensics to unearth valuable digital evidence in an innovative manner.

The analysis of mobile devices and hard drives has been the focus of the digital forensics world for years; but, there is another source of potential evidence that is not often considered: vehicles.^{1,2} In fact, vehicle forensics is so new that attorneys, investigators, or law enforcement may not even realize the wealth of digital information cars can provide. Many of today's digitally "connected cars" have infotainment and telematics systems that function like computers, storing information that they process, including user data from mobile phones and devices that have been synced to the system.^{2,3} These systems have been said to store unique identifying information originating from mobile devices such as call logs, contacts, sent/received text messages Short Message Service (SMS), and even social media feeds that remain on the system even when the phone is detached.^{2,4} User artifacts such as these can point to suspects or witnesses and/or play a role in corroborating or disproving someone's alibi. There has been little-to-no research conducted regarding how long these artifacts remain on the system and whether or not the user can remove those artifacts.

Additionally, there has been minimal research conducted regarding the types of user artifacts that can be left on vehicle systems by mobile devices. This is understandable since vehicle forensics is new and there is currently just one commercially available tool: Berla Corporation's iVe.^{2,4} Furthermore, due to the differences between various makes and models of infotainment systems, it stands to reason that the user information obtained from one system by iVe may be different than that obtained from another. Little research has been done regarding certain systems potentially providing more information than others.

This research seeks to answer the following research questions: Which user artifacts can be found on vehicle infotainment systems?; How long will those artifacts remain on the system?; Will any of those artifacts remain on the system once the devices are removed or unpaired through the on-screen interface?; and will different infotainment systems allow for recovery of different artifacts? For this study, two different makes and models of vehicle infotainment systems were used for the data acquisition process: a Uconnect® system and another with a Toyota® Extension Box. It was found that the Toyota® system provided a significant amount of user information (contacts, call logs, media files, locations, and unique identifiers), while the Uconnect® system only provided locations. Additionally, it was found that even when these paired devices were unsynced from the Toyota® system using the on-screen interface, a significant amount of acquirable information remained behind on the system: contacts, call logs, and media files were recovered from devices that were not currently connected to the system. When devices were unpaired from the Toyota® system using the on-screen interface, the mobile phone identifying information (i.e., International Mobile Equipment Identity (IMEI)) was unable to be recovered, but contacts, call logs, media

files, last sync time, and phone version could still be seen. Even after selecting the “Remove Personal Data” option on the Toyota® system, the same identifying information (contacts, call logs, etc.) could still be retrieved; call logs dating back several years were still recoverable from the system. While this study provides valuable insight into artifacts that can be found using vehicle forensics, future work should include the performance of physical acquisitions on vehicle systems, as well as analyzing data from other types of infotainment systems.

Reference(s):

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Vehicle Forensics, Infotainment Systems, Digital Artifacts