



Who searches your phone?

An initial approach to mobile forensic data extraction tools in Argentina



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Executive Summary

Photos, videos, calendars, contacts, locations visited, records of incoming and outgoing calls, messages sent, received and deleted, bank statements, e-mails, personal notes, and applications of all kinds are just some of the information that can be tracked on a cell phone.

In certain cases, this data can be used to find a criminal, determine the whereabouts of a suspect or hear someone's conversations just before committing a crime. Even more serious is the fact that our mobile contains not only an enormous amount of our private information but also that of third parties, such as friends, family, or co-workers. Thus, cell phones have become our most intimate space, while being a valuable piece of evidence for judicial investigations. 25

This requirement to obtain data stored on mobile devices and the technical difficulties that come about as a result gave rise to a growing industry specialized in developing and selling software that supplies courts with the tools to seize and analyze such information efficiently.

This report is an initial approach to the technologies being employed in Argentina for the different types of mobile data extraction and the companies behind them. To this end, first, we will explain the nature of these systems. Then, the judicial staff who use them and the main suppliers. Finally, we will present some of the challenges faced by the collection and analysis of digital evidence from cell phones and a number of considerations that should be taken into account for establishing a set of norms that do not violate individual rights.

Introduction

The treatment and regulation of digital evidence are one of the greatest challenges for criminal law and procedure today. Understood as any "evidentiary item that arises from a computer, digital or technological means",¹ digital evidence has become a vital element to conclude a wide number of investigations. At this point, it should not be surprising that the information seized from a computer or a smartphone can be relevant for a criminal prosecution, whether the crime is digital or not.

In previous reports, we examined the challenges that electronic data presents for judicial investigations.² For the purpose of this document, it suffices to say that the traditional norms regulating physical evidence do not adequately adjust to the digital environment. Features inherent to this type of proof – volatility, fragility, and need for technical know-how, among others³ – present problems that in certain cases require the sanction of a specific regulatory body for its treatment.

In turn, this regulation entails another challenge: it should be respectful of constitutional guarantees and be given enough precision to avoid violating the principle of legality,⁴ while at the same time, be flexible so as not to become obsolete in the face of new technological changes.

Collecting and analyzing digital evidence often requires specific technical knowledge. Thus, computer forensics is presented as the discipline in charge of "applying computer techniques to acquire, preserve, analyze and report data that has been processed and/or stored electronically and that are relevant in the

¹ ADC, "Legal Analysis of the Situation of Digital Evidence in the Criminal Procedure of Argentina, Vol. II", 2018, <https://adc.org.ar/wp-content/uploads/2019/06/038-analisis-juridico-de-la-ituacion-de-la-evidencia-digital-en-el-proceso-penal-en-argentina-vol-3-04-2018.pdf> pag.2

² Ibidem

³ For further details on the particular features of digital evidence, see the report published by ADC in 2018, "Legal Analysis of the Situation of Digital Evidence in the Criminal Procedure of Argentina," available at <https://adc.org.ar/wp-content/uploads/2019/06/038-analisis-juridico-de-la-situacion-de-la-evidencia-digital-en-el-proceso-penal-en-argentina-vol-3-04-2018.pdf>

⁴ Argentinian National Constitution, article 18

judicial field" and has an increasingly important role in legal processes.⁵ The procedures that experts perform in forensic labs to obtain electronic evidence and the tools they use are fundamental to determining the admissibility of the proof in court.

In this context, within the realm of digital evidence, there is a subtype that has recently gained special relevance: the one arising from mobile devices, or more specifically from smartphones.

In Argentina, the number of people using some type of smartphone was 34.8 million in 2021⁶. Photos, videos, calendars, contacts, locations visited, records of incoming and outgoing calls, messages sent, received and deleted, bank statements, e-mails, personal notes, and applications of all kinds are just some of the information that can be tracked on a cell phone.

In certain cases, this data can be used to find a criminal, determine the whereabouts of a suspect or hear someone's conversations just before committing a crime. Even more serious is the fact that our mobile contains not only an enormous amount of our private information but also that of third parties, such as friends, family, or co-workers. Thus, cell phones have become our most intimate space, while being a valuable piece of evidence for judicial investigations.

This requirement to obtain data stored on mobile devices and the technical difficulties that come about as a result gave rise to a growing industry specialized in developing and selling software that supplies courts with the tools to seize and analyze such information efficiently.

This report is an initial approach to the technologies being employed in Argentina for the different types of mobile data extraction and the companies behind them. To this end, first, we will explain the nature of these systems. Then, the judicial staff who use them and the main suppliers. Finally, we will

⁵ Informática forense: el camino de la Evidencia digital (Forensic informatics: the Path of Digital Evidence), Mariano Enrique Torres, available at http://www.cyta.com.ar/biblioteca/bddoc/bdlibros/informatica_forence.htm

⁶ Number of smartphone users in Argentina from 2015 to 2025
<https://en.statista.com/statistics/598527/number-of-mobile-users-in-argentina/>

present some of the challenges faced by the collection and analysis of digital evidence from cell phones and a number of considerations that should be taken into account for establishing a set of norms that do not violate individual rights.

What are mobile forensic data extraction tools and who uses them?

By mobile forensic extraction tools, we mean software designed to obtain as much information as possible from a cell phone through computer techniques, allowing whatever is seized to be properly incorporated into a judicial process.

In criminal investigations, this is performed by computer experts or digital labs that depend on national and provincial law enforcement agencies and security forces.⁷ The federal police and district attorneys, as well as most provincial prosecuting offices, are currently endowed with the technical means to carry out data extraction.

Among the agencies scrutinized for this report are: the Argentinian National Police Force or *Gendarmerie* (GNA), the Federal Police (PFA), the Airport Security Police (PSA), the Public Prosecutor's Office of the City of Buenos Aires, the City of Buenos Aires Police Department, the Public Prosecutor's Offices of Salta and Santiago del Estero, Judiciary of Chaco's Scientific Department, and Public Prosecutor's Offices of Chubut, the Province of Buenos Aires, Cordoba, Jujuy, and Santa Fe.

Software and providers

Law enforcement agencies and security forces are currently using a number of forensic extraction tools developed by private companies. This chapter will be focused on the suppliers with the highest global presence about whom we can ascertain that they are operating in Argentina.

UFED – Cellebrite

Cellebrite is an Israeli subsidiary of the Japanese firm Suncorporation Ltd, founded in 1999 as an artificial intelligence company. Among its services, Cellebrite offers " the most complete, industry-proven range of solutions that

⁷ ADC, "Forensic Investigation in Latin America", 2018, <https://adc.org.ar/wp-content/uploads/2019/06/037-la-investigacion-forense-informati-ca-en-america-latina-vol-2-04-2018.pdf>

encompass digital forensics, extraction, and analytics”⁸ to law enforcement, military, and intelligence agencies, as well as business customers around the world.⁹

In 2007, Cellebrite first launched the "Universal Forensic Extraction Device" (UFED), which today has become one of the world-leading forensic tools.¹⁰

Cellebrite's products allow access to a wide variety of devices including Android and IOS mobile operating systems, drones, SIM and SD cards, and GPS devices, among others. Since its creation, the company has updated its tools multiple times, and today at least ten associated products are being offered.¹¹

Cellebrite's main intelligence solution is UFED, which provides examiners with “the unprecedented ability to support more than 31,000 different digital device profiles and unlock leading Android and iOS devices.”¹² It is sold as software that can be installed on any PC (UFED 4PC) or in its UFED Touch2 version, which includes a tablet and accessories that enable seizure to be done anywhere.

In addition to the extraction tools themselves, Cellebrite also sells a line of products for analyzing the information obtained (Cellebrite Pathfinder and Cellebrite Inspector), which in some cases allow automated searches for people, places, or objects in images.¹³

⁸ Cellebrite official website, <https://www.cellebrite.com/en/about/company/>

⁹ According to media sources, Cellebrite has 65% of the world market for mobile device forensic extraction tools.
https://www.clarin.com/poli-ciales/detectives-telefonos-secretos-sistema-abre-celulares-resuelve-causas-com-plejas_0_U-d0fZd2m.html

¹⁰ Ibidem

¹¹ For details of product updates, <https://cellebrite.com/en/product-updates/>

¹² Cellebrite Official Website
<https://cellebrite.com/en/cellebrite-transforms-advanced-lawful-mobile-device-collection-review-capabilities-for-law-enforcement-agencies-worldwide-with-launch-of-premium-enterprise/>

¹³ Cellebrite Official Website <https://cellebrite.com/en/pathfinder/>

In Argentina, despite the high cost of this technology,¹⁴ UFED has nonetheless become the most widely used forensic extraction tool.¹⁵ According to journalistic sources, the number of licenses currently active throughout the country is estimated at 350.¹⁶

From the study we carried out, which included Access to Public Information Requests, interviews, and online research, we were able to confirm that UFED software is being used by at least the following investigative bodies:

Argentinian National Police Force or *Gendarmerie*:¹⁷

With a total of 18 digital labs throughout the country and at least 35 UFED licenses,¹⁸ the *Gendarmerie* (GNA) is one of Argentina's main buyers and users of Cellebrite products. On its official website, Cellebrite presents the GNA labs as a customer success story.¹⁹

In September 2019, the GNA procured a high-end smartphone unlocking workstation²⁰ through a direct contract with Security Team Network S.A. for a

¹⁴ A UFED toolkit would cost around U\$D 20,000, with an annual license of U\$D 7,000 to renew. https://www.clarin.com/policiales/detectives-tele-fonos-secretos-sistema-abre-celulares-resuelve-causas-complejas_0_U-d0fZd2m.html

¹⁵ Ibidem

¹⁶ Clarín. "Phone Detectives: secrets of the system that opens cell phones and solves the most complex cases," November 2020 https://web.archive.org/web/20201114090956/https://www.clarin.com/policiales/detectives-telefonos-se-cretos-sistema-abre-celulares-resuelve-causas-complejas_0_U-d0fZd2m.html

¹⁷ The information mentioned here comes from the research conducted for the report "Surveillance Technologies in Argentina", 2021. <https://adc.org.ar/wp-content/uploads/2022/03/ADC-Surveillance-Technology-in-Argentina.pdf>

¹⁸ Clarín. "Phone Detectives: secrets of the system that opens cell phones and solves the most complex cases," November 2020 <https://adc.org.ar/wp-con-tent/uploads/2021/12/ADC-Tecnologias-de-vigilancia-en-Argentina.pdf>

¹⁹ Cellebrite Official Website <https://cellebrite.com/en/argentinas-border-guard-force-is-crushing-time-and-distance-barriers-with-digital-intelligence/>

²⁰ File No. 37/105-0815-CDI19 <https://comprar.gob.ar/PLIEGO/VistaPreviaPlie-goCiudadano.aspx?qs=BQoBkoMoEhwbeNKAPenXR8IR3ih5YSXR79Wk8x7mmrwOC-g9j4XRUnx0kCgm3oU8Rx5zyjpByUn|6t4HsX9ox3IM|fHZHcPGbahOwPe58NWP7Ia-FH5JcDkQ==>

total amount of \$643,900.²¹ In November of the same year, the GNA Criminalistics and Forensic Studies Department bought four licenses for the "UFED 4PC" software. The purchase was made through a public tender won by Security Team Network for a total of 9,587,400 pesos (around 159,000 US dollars at the exchange rate of the time).²² More recently, in June 2020, the GNA upgraded these licenses, in a contract with the same company for a total of 132,116 dollars.²³

Airport Security Police (PSA):

In December 2020, the PSA entered into a direct contract with IAFIS Argentina S.A. to update and upgrade its UFED licenses for a total of 8,057,111 pesos (around 90,784 US dollars). The contract included the renewal of two UFED 4PC Ultimate and two UFED Touch 2 Ultimate²⁴ licenses for a two-year period, as well as the hardware swap of two Touch I devices for two UFED Touch 2.²⁵

Argentinian Federal Police (PFA):

²¹ Ibidem

²² GNA Criminalistics and Forensic Studies Department: "ACQUISITION OF UFED 4PC SOFTWARE FOR THE CRIMINALISTICS AND FORENSIC STUDIES DEPARTMENT". File No. 37/105-0041-LPU19. July 2018
<https://comprar.gob.ar/PLIEGO/VistaPreviaPliegoCiu-dadano.aspx?qs=BQoBkoMoEhy5xycgc2RiGO0seBx38Zrkqrf44NYcUHOQXWAZSx|F-biACHf8VvMdhxK5ugYZKg/ha7EWhWI7fjuQEoJmuXixefeg9/er7CV2Q|P|HNndQKq==>

²³ GNA Criminalistics and Forensic Studies Department: "ACQUISITION OF UFED 4PC SOFTWARE FOR THE CRIMINALISTICS AND FORENSIC STUDIES DEPARTMENT". File No. 37/105-0422-CDI20. March 2020
<https://comprar.gob.ar/PLIEGO/Vis-taPreviaPliegoCiudadano.aspx?qs=BQoBkoMoEhyrV/4BRRj7a9qf3aG8azk|h3K/KAn7jb/h6aPDkgsy3caJkIV5dh/I98fSQHDGyecUZqnGVTQz3UXLzeKrU0hskSjg8CnHW3bp5dO-0tjSzbq==>

²⁴ Cellebrite. UFED Ultimate. <https://www.cellebrite.com/en/ufed-ultimate/>

²⁵ Airport Security Police. "Renewal of licenses and upgrade of UFED 4PC and UFED TOUCH equipment, for Exclusivity". File No. 279-0027-CDI20. November 2020
<https://comprar.gob.ar/PLIEGO/VistaPreviaPliegoCiudadano.as-px?qs=BQoBkoMoEhy3ITxQqkwwChRpn2XPxXCsk5uij|Lsdq2DmF5S3lGnq|sUbG2uG-BeZPrbB8BhNUcLFrujs6LrFUaU3GDH8dDYrJv/eOuj/ve1TCcZ2AXWpaw==>

Through its Judicial Technology Support, High-Tech Crimes, and Computer Forensics divisions, the PFA also seems to be using the UFED tool to extract information from mobile devices. Although no documents could be found on how this software was purchased, its utilization in different judicial cases²⁶ allows us to infer that the PFA must have at least 3 UFED licenses²⁷²⁸.

Argentinian Coast Guard Police or Prefecture (PNA):

The PNA is also using Cellebrite's UFED product. In 2020, new licenses were given out to different units of its Scientific Forensic Department.²⁹

At the provincial level, the use of UFED software is widespread among Public Prosecutor's Offices and security forces. The following are some examples:

Regional Forensic Science Laboratories:

In 2010, the National Ministry of Justice and Human Rights promoted the development of forensic labs throughout the country. Thus, through agreements with different jurisdictions, it provided economic resources and supplies to equip their facilities. An official document from the Ministry of Justice reported that among the equipment distributed was Cellebrite's UFED solution.³⁰ In October

²⁶ Telam, 2020, "Rugby players' cell phones estimated to provide 4 terabytes of information." <https://www.telam.com.ar/notas/202001/427923-pericias-telefono-nos-celulares-rugbiers-crimen-fernando-baez-sosa-villa-gesell.html>

²⁷ Federal Prosecutor's Office N1 of Bahia Blanca, "Measures ordered to investigate context of body discovery in Villarino Viejo." <https://www.fiscales.gob.ar/violencia-institucional/disponen-medidas-para-investigar-el-contexto-que-ro-deo-al-hallazgo-del-cuerpo-en-villarino-viejo/>

²⁸ Radio Bicentenario 2020, "Rugbier's cellphones finally unlocked." <https://www.radiobicentenario.com.ar/nota/policia-federal/8389/finalmente-pudieron-desbloquear-celulares-diez-rugbiers.html>

²⁹ Annual Report 2020, Ministry of Security, Argentinian Maritime Prefecture, p.321 https://www.argentina.gob.ar/sites/default/files/2020/12/titulo_ii.pdf

³⁰ Ministry of Justice and Human Rights. "Regional Forensic Science Laboratories," August 2014 http://www.saij.gob.ar/docs-f/ediciones/libros/Laboratorios_Regionales_de_Invest._Forense.pdf

2021, a new addendum to the agreement stated that the National Ministry of Justice and Human Rights will allocate 125,000,000 pesos for the installation of Regional Forensic Science Labs, in which part of the funds will be assigned to update the UFED licenses purchased by the public prosecution offices of different provinces.³¹ Among the labs that have benefited are those of Entre Ríos,³² Mendoza, San Juan, San Luis, Formosa, Neuquén, Chubut, La Pampa, Corrientes and Misiones.³³

Public Prosecutor's Office of Salta:

This office has UFED4PC and UFED TOUCH technology since at least 2018, when it renewed its licenses through a direct contract with Security Team Network.³⁴

In 2019, the province seemed to have also purchased the Cellebrite UFED Infield product through a "procurement made with loans from the provincial government."³⁵ Additionally, in 2021, Salta was part of the arrangement to receive funding from the National Ministry of Justice to reinstate its UFED licenses,³⁶ and in September that year, it also renewed³⁷ a UFED ULTIMATE

³¹ Ministry of Justice invests \$125 million for the Public Prosecutor's Offices and Defense Lawyers to improve forensic science laboratories.

³² Entre Rios, "UFED devices, the new equipment for the Concordia police and the GNA in Paraná," <https://www.elentrerios.com/actualidad/dispositivos-ufed-el-nuevo-equipamiento-con-el-que-cuenta-la-poli-ca-de-concordia-y-la-gendarmiera-en-paran.htm>

³³ Ministry of Justice and Human Rights. "Regional Forensic Science Laboratories". August 2014 http://www.saij.gob.ar/docs-f/ediciones/libros/Laboratorios_Regionales_de_Invest_Forenses.pdf

³⁴ ADC "Surveillance Technologies in Argentina" 2021 <https://adc.org.ar/wp-content/uploads/2022/03/ADC-Surveillance-Technology-in-Arentina.pdf> - Public Prosecution of Salta, File No. 130-17.933/17

³⁵ Public Prosecutor's Office of the Province of Salta, "Northern District Attorneys will have new equipment."

³⁶ Public Prosecutor's Office of the Province of Salta <https://www.fiscalespenalesal-ta.gob.ar/?s=ufed>

³⁷ Public Bidding 12/21, Official Gazette of the Province of Salta <https://boletin-oficialsalta.gob.ar/instrumento.php?cXdlcnR5dGFibGE9QXwxMDAwODc4NjUmZG-F0YT0yMTA2M3wyMDIxcXdlcnR5>

TOUCH2 software license and a UFED CLOUD software license through a bidding process with the firm VEC SRL, for the amount of 1,430,370 pesos.³⁸

Judiciary of Chaco's Scientific Department (GCJ):

This province has had UFED software for mobile forensic extraction since at least 2014. The equipment is under the orbit of the GCJ,³⁹ which seems to be the only office using this technology in the province.⁴⁰ Its procurement was carried out through the National Ministry of Justice and Human Rights in the initiative to promote the development of Regional Forensic Investigation Laboratories.

Public Prosecutor's Office of Santiago del Estero:

The Biannual Institutional Report of this body states that the IT section of its Forensic Sciences Department has the UFED Touch2 solution for mobile device extraction.⁴¹

Public Prosecutor's Office of Chubut:

³⁸ Government College by Res. No. 20342 - PUBLIC BIDDING No. 12/2021 "RENEWAL OF 1(ONE) SOFTWARE LICENSE UFED ULTIMATE TOUCH2 AND 1(ONE) SOFTWARE LICENSE UFED CLOUD
[https://www.mpublico.gov.ar/Contratacion/Licitacion-Publi-ca-N-122021-%E2%80%9CRenovacion-de-1\(una\)-licencia-de-software-UFED-ULTIMA-TE-TOUCH2-y-1\(una\)-licencia-de-software-UFED-CLOUD%E2%80%9D.2825](https://www.mpublico.gov.ar/Contratacion/Licitacion-Publi-ca-N-122021-%E2%80%9CRenovacion-de-1(una)-licencia-de-software-UFED-ULTIMA-TE-TOUCH2-y-1(una)-licencia-de-software-UFED-CLOUD%E2%80%9D.2825)

³⁹ Diario 21 News Site, "How cell phones are inspected by Chaco's Forensic Science Department" March 2021
http://www.diario21.tv/notix2/movil2/noticia/151989_video---coacute-mo-se-perita-un-teleacutefo-no-celular-en-el-gabinete-cientiacutefico-del-chaco.html

⁴⁰ Prensa Justicia Chaco (Chaco Judiciary Press), "Judiciary will be furnished with high-tech equipment for forensic investigations" January 2018
<http://prensa.justiciachaco.gov.ar/node/2759>

⁴¹ Public Prosecutor's Office of the Province of Santa Fe, Annual Report 2018
<http://www.mpsde.gob.ar/wp-content/uploads/2020/09/Memoria-Institucional-MPF-Sgo.-17-18.pdf>

UFED Cellebrite technology for mobile data extraction⁴² is being used through the Multidisciplinary Technical Team based in Comodoro Rivadavia.

Public Prosecutor's Office of the Province of Buenos Aires:

According to its 2020 Annual Report,⁴³ UFED4PC technology was used in more than "10,000 items, including mobile devices, memory and SIM cards". Among the agencies that have this tool are the Office of IT Management (OFITEC) of Mercedes, the Forensic Complex Communications Laboratory of Mar del Plata, the Public Prosecutor's Office of Bahia Blanca,⁴⁴ and others.

Autonomous City of Buenos Aires Police Department:

The High-Tech Crimes and the Artificial Intelligence Analysis divisions, as well as the Special Investigations Section, are using the UFED4PC, UFED TOUCH2, and UFED AnalyticsPathfinder Desktop for mobile device forensic extraction and analysis. In 2021, a public tender⁴⁵ was called to renew seven UFED4PC licenses, two UFED TOUCH licenses, and one UFED AnalyticsPathfinder license for a 24-month term. The total amount of the contract was 29,278,296 pesos.

Public Prosecutor's Office of the Autonomous City of Buenos Aires.

⁴² Public Prosecutor's Office of Chubut, March 2018, "Rules for coordination between the multidisciplinary technical team and the Police Agency for the Investigation of Criminal Acts." http://www.mpfchubut.gov.ar/images/stories/comu-nicadores/Comodoro_Rivadavia/PGA_004946_Reglas_mnimas_ETM_policia.pdf

⁴³ Public Prosecutor's Office of the Province of Buenos Aires, Annual Statement 2020 <https://www.mpba.gob.ar/files/content/Informe%20de%20Gestion%202020.pdf>

⁴⁴ Public Prosecutor's Office of the Province of Buenos Aires, "Bahía Blanca Prosecution adopts UFED Software." <https://www.mpba.gov.ar/novedad/681>

⁴⁵ Single Stage Public Tender No. 2900- 1311-LPU20 <https://documentosbo-letinoficial.buenosaires.gob.ar/publico/PE-RES-MJYSGC-SSGA-5-21-ANX.pdf>

Technical specification:

<https://documentosboletinoficial.buenosaires.gob.ar/publico/PE-RES-MJYSGC-SSGA-5-21-ANX-1.pdf>

This office has ten UFED4PC and two KIOSK INFIELD licenses, also from Cellebrite, that are renewed annually. In 2020, the cost of license renewal was US\$ 171,087,⁴⁶ while in 2021, it was US\$ 119,161.⁴⁷ In both cases, the winning bidder⁴⁸ was IAFIS S.A., which happens to be one of the main dealers of Cellebrite technology in Argentina.

Previously, in 2019, two UFED4PC licenses had been procured through public bidding with the domestic firm Security Team Network for the amount of US\$27,000.⁴⁹ These products were deployed to the Judicial Investigations Department,⁵⁰ which, had already reinstated the license of another product in 2017, UFED Cloud Analyzer, also through a direct contract with the same company.⁵¹

Santa Fe Public Prosecutor's Office:

In August 2020, the Public Prosecutor's Office of the province signed a direct contract with the local company IAFIS Argentina S.A. to renew four UFED

⁴⁶ FGAF Resolution 230/2020, available at <https://mpfciudad.gob.ar/compras/search>

⁴⁷ PUBLIC TENDER 02-2021 REN1: Renewal of 7 UFED 4PC licenses and 2 KIOSK INFIELD licenses for use by the Buenos Aires Autonomous City Judicial Investigation Corps of the Public Prosecutor's Office of, Awarded by RESOLUTION FGAG 178/2021- AWARDING

⁴⁸ Resolution FGAG 178/2021 available at <https://mpfciudad.gob.ar/compras/search>

⁴⁹ UOA Provision 106-2019 available at <https://mpfciudad.gob.ar/storage/ar-chivos/Disposici%C3%B3n%20UOA%20106-2019.pdf>

⁵⁰ Autonomous City of Buenos Aires. Provision No. 65/UOA/ 19 July 2019 https://documentosboletinoficial.buenosaires.gob.ar/publico/ck_PJ-DIS-MPF-UOA-65-19-5660.pdf

⁵¹ Public Prosecutor's Office of the Province of Buenos Aires. UOA Provision No. 45/2017. September 2017 <https://mpfciudad.gob.ar/storage/archivos/Disposi-ci%C3%B3n%20UOA%20N%C2%BA%2045-17%20A%2030-00036938%20Adjudica-cion%20SECURITY%20TEAM%20NETWORK%20S.A.%20-Ufed%20Cloud-.pdf>

Touch 2 licenses for a one-year term and to purchase three new UFED 4PC licenses for a total of \$96,226.⁵²⁵³

Córdoba Public Prosecutor's Office:

At least since 2013, this body has been using UFED Cellebrite technology. In 2015, it called for a public tender⁵⁴ to acquire "one (1) set of hardware and software for mobile forensic data extraction and analysis, type CELLEBRITE UFED SYSTEM + UFED CLOUD ANALYZER or of higher quality" with an allocated budget of 828,120 pesos. In 2020, the office "incorporated UFED 4PC equipment to the Mobile Equipment Unit of the Criminal Analysis and IT Department's Forensic Science Office division to extract information from mobile devices."⁵⁵

The information mentioned above gives an idea of the scope of Cellebrite's UFED tool in our country. Journalistic sources report the existence of more than 350⁵⁶ UFED licenses in Argentina, so the examples listed in this report are likely to be only a small percentage of the total number of contracts signed for its deployment.

⁵² Public Prosecutor's Office of the Province of Santa Fe. File No. FG-000303-2020. August 2020
https://www.mpa.santafe.gov.ar/regulations_fi-les/5f328fd04126a_Resoluci%C3%B3n%20N%C2%B0%20274.pdf

⁵³ This information was obtained when conducting ADC's research for the report "Surveillance Technologies in Argentina", 2021, available at
<https://adc.org.ar/wp-content/uploads/2022/03/ADC-Surveillance-Technology-in-Arentina.pdf>

⁵⁴ Abbreviated Tender 25/2015 published in the official gazette
https://boletin-oficial.cba.gov.ar/wp-content/4p96humuzp/2015/11/181115_bocba_4ssvU1Gn.pdf
- Technical specifications at
<https://silo.tips/download/compulsa-abreviada-n-25-15-plie-go-de-condiciones-generales-y-especificaciones-te>

⁵⁵ Public Prosecutor's Office of Cordoba, "Incorporation of technology in the Public Prosecution"
<http://www.mpfcordoba.gob.ar/incorporacion-de-tecnologia-en-el-mpf/>

⁵⁶ Clarín newspaper, "Phone detectives: secrets of the system that opens cell phones and solves the most complex cases". November 2020
https://web.archive.org/web/20201114090956/https://www.clarin.com/policiales/detectives-telefonos-se-cretos-sistema-abre-celulares-resuelve-causas-complejas_0_U-d0fZd2m.html

MSAB XRY

MSAB is a Swedish company, founded in 1984, that specializes in the development of mobile extraction and analysis tools. Its customers include “law enforcement agencies, but also prisons and correctional institutions, intelligence agencies, tax authorities, border control agencies, the military, and selected private companies.”⁵⁷

Its main forensic software solution is XRY, which in turn, has a line of products including:

- **XRY Logical:**⁵⁸ Touted by the company as its best-selling product, it allows access to and recovery of any file system data in real-time.
- **XRY Physical:**⁵⁹ The next level XRY license enables to do physical recovery, bypassing the device's operating system and thus, accessing protected and deleted data, even breaching the encryption if the device is locked.
- **XRY Cloud:**⁶⁰ This model recovers information in the cloud. As stated by the company, XRY Cloud can look for online social media data from services such as Facebook, Google, iCloud, Twitter, and Snapchat without the need for users to re-enter their login details.

XRY's main market is in Europe and more specifically, in the United Kingdom, where it is the provider of 97% of the security forces.⁶¹

⁵⁷ MSAB Official Website <https://www.msab.com/>

⁵⁸ MSAB Official Website, description of XRY Logical
<https://www.msab.com/product/xry-extract/xry-logical/>

⁵⁹ MSAB Official Website, description of XRY Physical
<https://www.msab.com/product/xry-extract/xry-physical/>

⁶⁰ MSAB Official Website, description of XRY Cloud
<https://www.msab.com/product/xry-extract/xry-cloud/>

⁶¹ MSAB Official Website <https://www.msab.com/about-us/>

In Argentina, records of its use by law enforcement and security forces were found to exist at least since 2014. The estimated price of an XRY complete kit-Mobile forensic extraction tool which includes the hardware and software, is \$7,990,⁶² with an annual license to then be renewed for another \$3,000.⁶³

Some of the bodies using this technology are the National Public Prosecutor's Office⁶⁴ through the Investigations and Criminal Investigations and Technological Support Directorate; the Public Prosecutor's Office of Río Negro;⁶⁵ the Judiciary of Chaco through the Judicial Scientific Department,⁶⁶ the Public Prosecutor's Offices of the Province of Buenos Aires⁶⁷ and Santiago del Estero. The latter has been found to be using this product since at least 2014.⁶⁸

The province of Santiago del Estero acquired its software through a donation registered in Resolution 51/2014, which included the XRY OFFICE model, comprising XRY Logical hardware and software.⁶⁹ Although no records of new purchases were found, the Biannual Report 2017-2018 of the province's Public

⁶² The information arises from a purchase made by the government of Puerto Rico in 2020, available at <https://transicion2020.pr.gov/Agencias/189/Informe%20Inventa-rio%20Propiedad/Informe%20de%20Inventario%20de%20Propiedad%20-%20NCF.pdf>

⁶³ Description of MSAB on the Security Weekly portal, 01.10.2015 <https://www.scmagazine.com/product-test/content/msab-xry-office>

⁶⁴ National Public Prosecutor's Office, Annual Report 2016, Page 72 <https://www.mpf.gob.ar/wp-content/uploads/2017/05/Informe-Anual-2016.pdf>

⁶⁵ Public Prosecution of Río Negro Province, Annual Report 2017 https://mi-nisteriopublico.jusrionegro.gov.ar/content/memorias/memoria_2017.pdf

⁶⁶ Prensa Justicia Chaco (Chaco Judiciary Press), "Judiciary will be furnished with high-tech equipment for forensic investigations" January 2018 <http://prensa.justiciachaco.gov.ar/node/2759>

⁶⁷ Public Prosecutor's Office of Buenos Aires Province, Annual Statement 2019 <https://www.mpba.gov.ar/files/content/Informe%20de%20Gestion%202019.pdf>

⁶⁸ Public Prosecutor's Office of Santiago del Estero, Annual Report 2014 <http://www.mpfde.gob.ar/wp-content/uploads/2017/11/15-06-11Memoria-2014-FINAL.pdf>

⁶⁹ Public Prosecutor's Office of Santiago del Estero, Annual Report 2015, Page 73 <http://www.mpfde.gob.ar/wp-content/uploads/2017/11/Memoria-2015-FINAL.pdf>

Prosecution states that the tool is currently used in the IT area of the Forensic Science Department.⁷⁰

For its part, the Argentinian Federal Police held a nationwide tender in 2018, to purchase seven complete versions of XRY mobile data extraction devices, with a license for thirty-six months.⁷¹

Magnet AXIOM by Magnet Forensics

Magnet Forensics⁷² is a Canadian-based company, founded in 2010, which is dedicated to developing investigation software for the collection, analysis, presentation, and management of evidence from digital sources. Its customers include law enforcement agencies, security forces, and corporations.

Its main product is Magnet AXIOM Cyber,⁷³ which enables the retrieval of digital evidence from various types of media, including smartphones, cloud services, and computers, among others.⁷⁴ Regarding mobile devices, AXIOM claims that it can "find photos, chats, and web browsing history from iOS and Android devices". In addition, it can recover and analyze data from several encrypted applications installed on the cell phone.

In Argentina, law enforcement agencies and security forces were found to be using AXIOM software. In 2020, the Public Prosecutor's Office of the Autonomous City of Buenos Aires renewed 6 one-year Magnet AXIOM licenses

⁷⁰ Public Prosecutor's Office of Santiago del Estero, Annual Report 2018
<http://www.mpfsde.gob.ar/wp-content/uploads/2020/09/Memoria-Institucional-MPF-Sgo.-17-18.pdf>

⁷¹ Terms and conditions available at
<http://onc-ftp1.argentinacom-pra.gov.ar/0030/000/050000012018000000/CNV-000739256001.pdf> and at
<https://www.argentinalicitaciones.com/adquisicion-de-siete-7-dispositivos-para-extraccion-de-datos-de-aparatos-de-telefonía-celular-movil-marca-xry-version-completa-con-licencia-por-treinta-y-seis-36-meses-lct20532.html>

⁷² Magnet Forensics Official Website <https://www.magnetforensics.com/>

⁷³ Magnet Forensics Official Website
<https://www.magnetforensics.com/products/magnet-axiom-cyber/>

⁷⁴ Magnet Forensics Official Website
<https://www.magnetforensics.com/products/magnet-axiom-cyber/>

with support services and updates to be used by the Judicial Investigation Body for an amount of 2,379,972 pesos.⁷⁵

Previously, in 2019, there had been a renewal of the same Magnet AXIOM licenses for \$21,000.⁷⁶

The Buenos Aires City Police is also using the AXIOM tool,⁷⁷ through its Cybercrime Department, the Artificial Intelligence Analysis Division, and the Special Investigations Section. In December 2020, the Public Prosecutor's Office of Santa Fe purchased a Magnet AXIOM Complete solution for the forensic analysis of computers and mobile devices and a Magnet AXIOM Cloud license for the amount of 1,330,200 pesos.⁷⁸ The Province of Jujuy's Public Prosecutor's Office renewed a Magnet AXIOM license in 2020, through the Computer Forensics department of its Investigation Agency.⁷⁹

Up to this point, we have mentioned some of the main forensic extraction tools used by law enforcement agencies and security forces in Argentina. Worldwide, the two main suppliers are Cellebrite, with its UFED tool, and MSAB with XRY, being UFED the most widespread in our country. Other software solutions that were not analyzed in this report but that can also be employed for data extraction and analysis are Encase Mobile and Oxygen Forensic, among others. In addition, there is an industry of open-source development tools, some aspects of which will be discussed in the next section.

⁷⁵ OAF Provision 81/2020 available at <https://mpfciudad.gob.ar/compras/search>

⁷⁶ UOA Provision 63/2019 available at <https://mpfciudad.gob.ar/compras/search>

⁷⁷ Request for Access to Public Information submitted by ADC in October 2021 under file number N EX-2021-23272451-GCABABA-DGSOCAI-21

⁷⁸ Public Prosecutor's Office of the Province of Santa Fe, Annual Report 2020 https://mpa.santafe.gov.ar/mediafiles/nw5f6352fde34f4_58_Informe%20de%20Gesti%C3%B3n%20de%20la%20Fiscal%C3%ADa%20General%20%7C%202018-2019.pdf

⁷⁹ RESOLUTION No. 2137- MPA /2020.- SAN SALVADOR DE JUJUY, Dec 29 2020 <http://boletinoficial.jujuy.gob.ar/?p=213545>

The importance of source codes

From the inquiry conducted so far, the reader may have noticed that the vast majority of the tools and programs used by law enforcement agencies, prosecutors' offices, and judicial staff to collect data from mobile devices are developed and sold by private companies. This technology operates under what is known as commercial or proprietary software, i.e., the source code of the product is protected by intellectual property rights⁸⁰ and usually sold for a fee.⁸¹ Thus, a fundamental stage of the judicial process, which is obtaining evidence that may determine a person's guilt or innocence, is carried out through programs with codes and algorithms that are disclosed.

This could present a challenge to article 18 of the National Constitution, which recognizes that an individual accused of a crime has the right to know and control the evidence being used against them.⁸² Certain legal doctrine in Argentina⁸³ and jurisprudence abroad⁸⁴ argue that ruling out this type of program altogether, for the simple fact that the codes and algorithms are secret, is not reasonable. Given that accessing free software tools to unlock and extract

⁸⁰ Gustavo Presman and Pablo A. Palazzi, "El uso de software abierto para el análisis de la evidencia digital" (The use of open-source software for the analysis of digital evidence) available at <https://udes.edu.ar/sites/default/files/revistadyntno1.pdf>

⁸¹ In contrast, free or open-source software allows accessing, sharing and modifying the source code in favor of the community.

⁸² "A QUESTION OF CODES: THE USE OF SECRET ALGORITHMS IN CRIMINAL JUSTICE" Polansky Jonathan A. (2020). Constitutional guarantees of criminal procedure in a digital environment (1st Edition). Hammurabi <https://biblioteca.hammurabidigi-tal.com.ar/reader/garantias-constitucionales-en-entorno-digital?location=99>

⁸³ Polansky Jonathan A. "Garantías constitucionales del procedimiento penal en entorno digital" (Constitutional guarantees of criminal procedure in a digital environment). 1st Edition. Hammurabi 2020 <https://biblioteca.hammurabidigital.com.ar/reader/garantias-constitucionales-en-entorno-digital?location=102>

⁸⁴ In Argentina, there is no complete jurisprudential development on the subject, but in the USA, the issue has been addressed, among others, in the case of TrueAllele DNA detection programs analyzed in the "Commonwealth of Pennsylvania v. Michael Robinson" case CC 201307777, decided by the Allegheny County Court of Pennsylvania <https://www.prisonlegalnews.org/news/2017/mar/9/defense-attorneys-seek-access-dna-matchin-g-softwares-source-code/>

data from mobile devices is not easy, an absolute ban would leave courts without the possibility of obtaining key evidence.⁸⁵

In this regard, it should be noted that trade secrecy is a legitimate interest guaranteed by the law. However, it cannot be invoked in situations that may affect fundamental rights such as the right of defense mentioned above. The admissibility of this software in court cases must ensure that it follows a well-founded methodology and that the results yielded are not manipulated. To this end, promoting transparency and control over how these tools work is essential to supervise their functioning and detect possible deficiencies that could affect the reliability of the evidence produced.

By way of example, in April 2021 the CEO of Signal, the instant messaging service provider, reported having found vulnerabilities in the UFED software⁸⁶. Cellebrite's tool could be infected through a program installed on a phone.

As he explained, "by including a specially formatted but otherwise innocuous file in an app on a device that is then scanned by Cellebrite, it is possible to execute code that modifies not just the Cellebrite report being created in that scan, but also all previous and future generated Cellebrite reports from all previously scanned devices and all future scanned devices in any arbitrary way (inserting or removing text, email, photos, contacts, files, or any other data)."⁸⁷ The news calls the legitimacy of the tool into question, and several courts in the United States have been asked to review sentences based solely on evidence provided by Cellebrite reports.⁸⁸

As mentioned above, the use of commercial software forensic tools must be carefully examined so as not to affect the right of defense in a public trial, sanctioned by article 18 of the National Constitution. The detection of flaws in a digital program that may cast doubts on the evidence produced must be

⁸⁵ Ibidem

⁸⁶ Signal, "Exploiting vulnerabilities in Cellebrite UFED and Physical Analyzer from an app's perspective", 21.04.2021 <https://signal.org/blog/cellebrite-vulnerabilities/>

⁸⁷ Ibidem

⁸⁸ Vice, "Lawyer Asks for New Trial After Cellebrite Vulnerability Discovery", 27.04.2021 <https://www.vice.com/en/article/5dbpyq/lawyer-new-trial-cellebri-te-signal-vulnerability>

considered when court officials choose one software over another. In addition, the secrecy of source codes hampers adequate control over the methods used. In Argentina, although in an early stage of development,⁸⁹ the use of open software, in which the source code is public, is an alternative that could facilitate proper control by defendants of the tools being used against them.

⁸⁹ Gustavo Presman and Pablo A. Palazzi, "El uso de software abierto para el análisis de la evidencia digital" (The use of open-source software for the analysis of digital evidence) available at <https://udesa.edu.ar/sites/default/files/revistadyntno1.pdf>

Final Considerations

Up to this point, the purpose of this report has been to describe the main software programs being used in Argentina for mobile device forensic extraction.

The sensitivity of the information that our cell phones normally store demands that the tasks of data extraction and analysis, as well as the norms regulating the use of their results in court, be respectful of the rights and guarantees of the defendant. Unlocking and searching a person's mobile is one of the most privacy-invasive measures available and, therefore, when a judge orders such extraction, they must apply strict criteria of necessity and proportionality to justify the measure. This requires reshaping the concept of privacy, which is traditionally linked to the idea of the ownership of an enclosed space.⁹⁰ To this end, specific rules must be designed to incorporate the particularities of new technologies and thus increase the protection of individuals to ensure the effective protection of their rights.

We should also bear in mind that although forensic extraction may produce relevant information within a criminal case, there is also a large amount of personal data which is totally unrelated to the subject. This poses a challenge as to how content stored in a device should be collected and examined avoiding potential infringements to the right to privacy. The traditional rules governing physical searches are poorly adjusted when it comes to electronic media. Authorities should ensure that the analysis of the information is limited by the object of the case,⁹¹ to mitigate the impact accessing their phone has on a person's privacy.

As for the tech firms, due to their role in the development and sale of these systems, efforts should be made to promote transparency in their development and procurement. While there may be legitimate reasons for not providing data

⁹⁰ ADC, "El Debido Proceso Digital" (Digital Due Process), 2019
<https://adc.org.ar/wp-content/uploads/2019/12/El-debido-proceso-digital-12-2019-V1.pdf>

⁹¹ There are very pertinent discussions about how the analysis of data should be carried out and in which cases it is possible to use the information found that is not part of the object under investigation. The discussion about the application of the "Plain View" doctrine is partially analyzed in "Constitutional Guarantees of Criminal Procedure in the Digital Environment" by Polansky, Jonathan A. (2020).

due to intellectual property issues, this should by no means imply that a suspect is denied the necessary information to plan their defense. In this sense, some mechanisms allow greater control over how these systems operate, to avoid an infringement of rights. For example, spaces could be designed where companies explain how their programs work or encourage innovative types of algorithms created which allow them to be audited by independent parties.⁹²

Furthermore, in the development of technologies, companies must commit themselves to respect human rights. To this end, ADC released a series of recommendations through the guide "How to implement human rights due diligence in technology development."⁹³ For example, when software tools include facial recognition capable of identifying individuals through image analysis, the risks of discrimination entailed by these technologies should be present. The same can happen with other functionalities of tools that may use artificial intelligence.

In conclusion, the treatment and regulation of evidence from mobile devices are fundamental for criminal law and procedure due to their relevance in all types of investigations. Knowledge of how the procedures by which law enforcement agencies and security forces can access these devices is essential to ensure a regulatory framework that is respectful of human rights. To this end, transparency in the development of technologies and their procurement by governments is key to adequate control.

Notes

⁹² Polansky Jonathan A. "Garantías constitucionales del procedimiento penal en entorno digital" (Constitutional guarantees of criminal procedure in a digital environment). 1st Edition. Hammurabi 2020
<https://biblioteca.hammurabidigital.com.ar/reader/garantias-constitucionales-en-entorno-digital?location=103>

⁹³ ADC, "How to Implement Human Rights Due Diligence in Technology Development The Impact on Privacy", 2020
<https://adc.org.ar/wp-content/uploads/2020/10/Guia-Debida-Diligencia-DDHH-Analisis-de-Impacto-en-Privacidad.pdf>



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