

TUGAS KEAMANAN JARINGAN KOMPUTER

JPEG FORENSIC



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Forensic foto dengan format JPEG dapat dilakukan melalui website forensic yang tersedia di internet. Terdapat beberapa situs website yang dapat digunakan. Diantaranya adalah :

1. Fotoforensic (<http://fotoforensics.com>)

Pada percobaan ini, dilakukan 2 input yaitu foto pertama merupakan foto asli dan foto kedua yaitu foto yang telah di edit menggunakan tool paint.

Berikut adalah foto yang akan di forensic :

a. Foto asli



Berikut ini adalah hasil forensic dari kedua foto diatas :

- Digest

| | |
|------------------------|------------------------------------------------------------------|
| Filename: | IMG_20171224_165152_HDR.jpg |
| Filetime: | 2018-04-08 11:42:19 GMT |
| File Type: | image/jpeg |
| Dimensions: | 4208x2368 |
| Color Channels: | 3 |
| File Size: | 1,768,475 bytes |
| MD5: | 50ec20544ac39c915b17b7b2cda4f1cb |
| SHA1: | 317c5c57452e8966af7912f2e918ba5cbe6aa8ce |
| SHA256: | 9ce540d0861ce30aa910db419a50dd96b0bda2bd0ee8745b57c59a927748c675 |

- Metadata

| File | |
|----------------------|------------------------------|
| File Type | JPEG |
| File Type Extension | jpg |
| MIME Type | image/jpeg |
| Exif Byte Order | Little-endian (Intel, II) |
| Image Width | 4208 |
| Image Height | 2368 |
| Encoding Process | Baseline DCT, Huffman coding |
| Bits Per Sample | 8 |
| Color Components | 3 |
| Y Cb Cr Sub Sampling | YCbCr4:2:0 (2 2) |

EXIF**Image Description**

| | |
|--------------------------|-----------------------------|
| Make | Xiaomi |
| Camera Model Name | Redmi Note 4X |
| Orientation | Horizontal (normal) |
| X Resolution | 72 |
| Y Resolution | 72 |
| Resolution Unit | inches |
| Software | MediaTek Camera Application |
| Modify Date | 2017:12:24 16:51:52 |
| Y Cb Cr Positioning | Co-sited |
| Exposure Time | 1/1189 |
| F Number | 2.0 |
| Exposure Program | Not Defined |
| ISO | 100 |
| Exif Version | 0220 |
| Date/Time Original | 2017:12:24 16:51:52 |
| Create Date | 2017:12:24 16:51:52 |
| Components Configuration | Y, Cb, Cr, - |
| Exposure Compensation | 0 |
| Metering Mode | Center-weighted average |
| Light Source | Other |
| Flash | No Flash |
| Focal Length | 3.5 mm |
| Sub Sec Time | 59 |
| Sub Sec Time Original | 59 |
| Sub Sec Time Digitized | 59 |
| Flashpix Version | 0100 |

| | |
|--------------------------|-----------------------------|
| Color Space | sRGB |
| Exif Image Width | 4208 |
| Exif Image Height | 2368 |
| Interoperability Index | R98 - DCF basic file (sRGB) |
| Interoperability Version | 0100 |
| Exposure Mode | Auto |
| White Balance | Auto |
| Digital Zoom Ratio | 1 |
| Scene Capture Type | Standard |
| Compression | JPEG (old-style) |
| Thumbnail Offset | 1280 |
| Thumbnail Length | 44288 |
| Thumbnail Image | (Binary data 44288 bytes) |

Composite

| | |
|--------------------|------------------------|
| Aperture | 2.0 |
| Shutter Speed | 1/1189 |
| Create Date | 2017:12:24 16:51:52.59 |
| Date/Time Original | 2017:12:24 16:51:52.59 |
| Modify Date | 2017:12:24 16:51:52.59 |
| Focal Length | 3.5 mm |
| Image Size | 4208x2368 |
| Light Value | 12.2 |
| Megapixels | 10.0 |

- JPEG%

JPEG last saved at 89% quality (estimated)

Quality determined from the quantization tables that encoded the JPEG:

| JPEG Q0: Luminance | | | | | | | | JPEG Q1: Chrominance | | | | | | | |
|--------------------|----|----|----|----|----|----|----|----------------------|----|----|----|----|----|----|----|
| 4 | 2 | 2 | 4 | 4 | 8 | 10 | 12 | 4 | 4 | 4 | 10 | 20 | 20 | 20 | 20 |
| 2 | 2 | 2 | 4 | 6 | 12 | 12 | 12 | 4 | 4 | 6 | 14 | 20 | 20 | 20 | 20 |
| 2 | 2 | 4 | 4 | 8 | 12 | 14 | 12 | 4 | 6 | 12 | 20 | 20 | 20 | 20 | 20 |
| 2 | 4 | 4 | 6 | 10 | 18 | 16 | 12 | 10 | 14 | 20 | 20 | 20 | 20 | 20 | 20 |
| 4 | 4 | 8 | 12 | 14 | 22 | 20 | 16 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 4 | 8 | 12 | 12 | 16 | 20 | 22 | 18 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 10 | 12 | 16 | 18 | 20 | 24 | 24 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 14 | 18 | 20 | 20 | 22 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

- b. Foto yang telah di edit



Foto diatas telah di crop menggunakan aplikasi paint.

- Digest

| | |
|-----------------|------------------------------------------------------------------|
| Filename: | Untitled.jpg |
| Filetime: | 2018-04-08 11:04:18 GMT |
| File Type: | image/jpeg |
| Dimensions: | 3944x2272 |
| Color Channels: | 3 |
| File Size: | 1,567,655 bytes |
| MD5: | a2c6e0fd6190317f51386a8e435dbc4b |
| SHA1: | d7a632380f6784d9e2c760300a7712448064d556 |
| SHA256: | a433839d8fa0bf90666cfd1d083297b58bddcc69cf921912218d5195e74c0f14 |

- JPEG%

JPEG last saved at 94% quality (JPEG Standard)

Quality determined from the quantization tables that encoded the JPEG:

| JPEG Q0: Luminance | | | | | | | | JPEG Q1: Chrominance | | | | | | | |
|--------------------|----|----|----|----|----|----|----|----------------------|----|----|----|----|----|----|----|
| 2 | 1 | 1 | 2 | 3 | 5 | 6 | 7 | 2 | 2 | 3 | 6 | 12 | 12 | 12 | 12 |
| 1 | 1 | 2 | 2 | 3 | 7 | 7 | 7 | 2 | 3 | 3 | 8 | 12 | 12 | 12 | 12 |
| 2 | 2 | 2 | 3 | 5 | 7 | 8 | 7 | 3 | 3 | 7 | 12 | 12 | 12 | 12 | 12 |
| 2 | 2 | 3 | 3 | 6 | 10 | 10 | 7 | 6 | 8 | 12 | 12 | 12 | 12 | 12 | 12 |
| 2 | 3 | 4 | 7 | 8 | 13 | 12 | 9 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 3 | 4 | 7 | 8 | 10 | 12 | 14 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 6 | 8 | 9 | 10 | 12 | 15 | 14 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 9 | 11 | 11 | 12 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |

- Metadata

| File | |
|----------------------|------------------------------|
| File Type | JPEG |
| File Type Extension | .jpg |
| MIME Type | image/jpeg |
| Image Width | 3944 |
| Image Height | 2272 |
| Encoding Process | Baseline DCT, Huffman coding |
| Bits Per Sample | 8 |
| Color Components | 3 |
| Y Cb Cr Sub Sampling | YCbCr4:2:0 (2 2) |
| JFIF | |
| JFIF Version | 1.01 |
| Resolution Unit | inches |
| X Resolution | 96 |
| Y Resolution | 96 |
| Composite | |
| Image Size | 3944x2272 |
| Megapixels | 9.0 |

2. Forensically Beta (<https://29a.ch>)

Foto yang digunakan sama dengan foto pada percobaan pertama

a. Foto Asli

- Clone Detection



- Metadata

| | |
|-------------------------|-------------------------------------------------------------------------------------|
| ImageDescription | |
| Make | Xiaomi |
| Model | Redmi Note 4X |
| Orientation | 1 |
| XResolution | 72 |
| YResolution | 72 |
| ResolutionUnit | 2 |
| Software | MediaTek Camera Application |
| ModifyDate | 2017:12:24 16:51:52 |
| YCbCrPositioning | 2 |
| ExposureTime | 0.0008 |
| FNumber | 2 |
| ExposureProgram | 0 |
| ISO | 100 |
| DateTimeOriginal | Sun Dec 24 2017 23:51:52 GMT+0700 (SE Asia Standard Time) |
| CreateDate | Sun Dec 24 2017 23:51:52 GMT+0700 (SE Asia Standard Time) |
| ExposureCompensation | 0 |
| MeteringMode | 2 |
| LightSource | 255 |
| Flash | 0 |
| FocalLength | 3.5000 |
| SubSecTime | 59 |
| Hasn | 0 |
| FocalLength | 3.5000 |
| SubSecTime | 59 |
| SubSecTimeOriginal | 59 |
| SubSecTimeDigitized | 59 |
| ColorSpace | 1 |
| ExifImageWidth | 4208 |
| ExifImageHeight | 2368 |
| ExposureMode | 0 |
| WhiteBalance | 0 |
| DigitalZoomRatio | 1 |
| SceneCaptureType | 0 |
| InteropIndex | R98 |
| HasThumbnail | true |
| ThumbnailWidth | 256 |
| ThumbnailHeight | 144 |
| ThumbnailType | image/jpeg |
| Thumbnail |  |

- String Extraction

```
Exif
Xiaomi
Redmi Note 4X
MediaTek Camera Application
2017:12:24 16:51:52
0220
0100
2017:12:24 16:51:52
2017:12:24 16:51:52
0100
JFIF
%&'()*456789:CDEFGHIJSTUVWXYZcdefghijstuvwxyz
&'()*56789:CDEFGHIJSTUVWXYZcdefghijstuvwxyz
kE37
ioud
Wmw$Sa8DUB
X@7Kss H
lDRccl
Z&?<WQ(V
IRIm
Wgta
cnI4
kCSO
PTH3
6YXg
XKgc
```

- b. Foto yang telah di edit

- Clone Detection



- Metadata

No Metadata Found

- String Extraction

```
JFIF
%&'()*456789:CDEFGHIJSTUVWXYZcdefghijstuvwxz
&'()*456789:CDEFGHIJSTUVWXYZcdefghijstuvwxz
rWg4
83sG
WssN
QAAG
Sytyt
Mhvw
GEIG
njEj
edbO
7u5W
jfRM
QG0r
sM2P
PPQE
8VIw
w7SA
Whww
euRE8
9aNe
SYI5y
rM9c
O4yt
NCsRn
IE7w
```