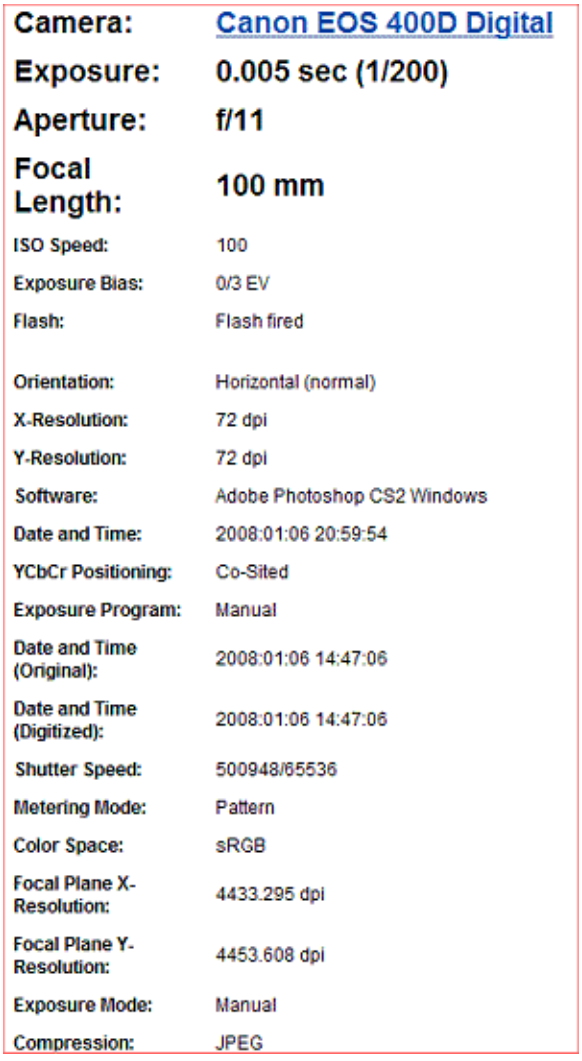
EXIF : Sensitive Data Exposure

What is EXIF Metadata?

EXIF stands for Exchangeable Image File Format. It is a record which shows the digital SLR camera settings used to take a particular photograph. This data is recorded into the actual image file.

Therefore each photograph has its own unique data. EXIF data shows photo information such as camera model, exposure, aperture, ISO, what camera mode was used and whether or not a flash fired. The below image is an example of how EXIF Metadata looks like.



Camera:	**Canon EOS 400D Digital**
Exposure:	**0.005 sec (1/200)**
Aperture:	**f/11**
Focal Length:	**100 mm**
ISO Speed:	100
Exposure Bias:	0/3 EV
Flash:	Flash fired
Orientation:	Horizontal (normal)
X-Resolution:	72 dpi
Y-Resolution:	72 dpi
Software:	Adobe Photoshop CS2 Windows
Date and Time:	2008:01:06 20:59:54
YCbCr Positioning:	Co-Sited
Exposure Program:	Manual
Date and Time (Original):	2008:01:06 14:47:06
Date and Time (Digitized):	2008:01:06 14:47:06
Shutter Speed:	500948/65536
Metering Mode:	Pattern
Color Space:	sRGB
Focal Plane X-Resolution:	4433.295 dpi
Focal Plane Y-Resolution:	4453.608 dpi
Exposure Mode:	Manual
Compression:	JPEG

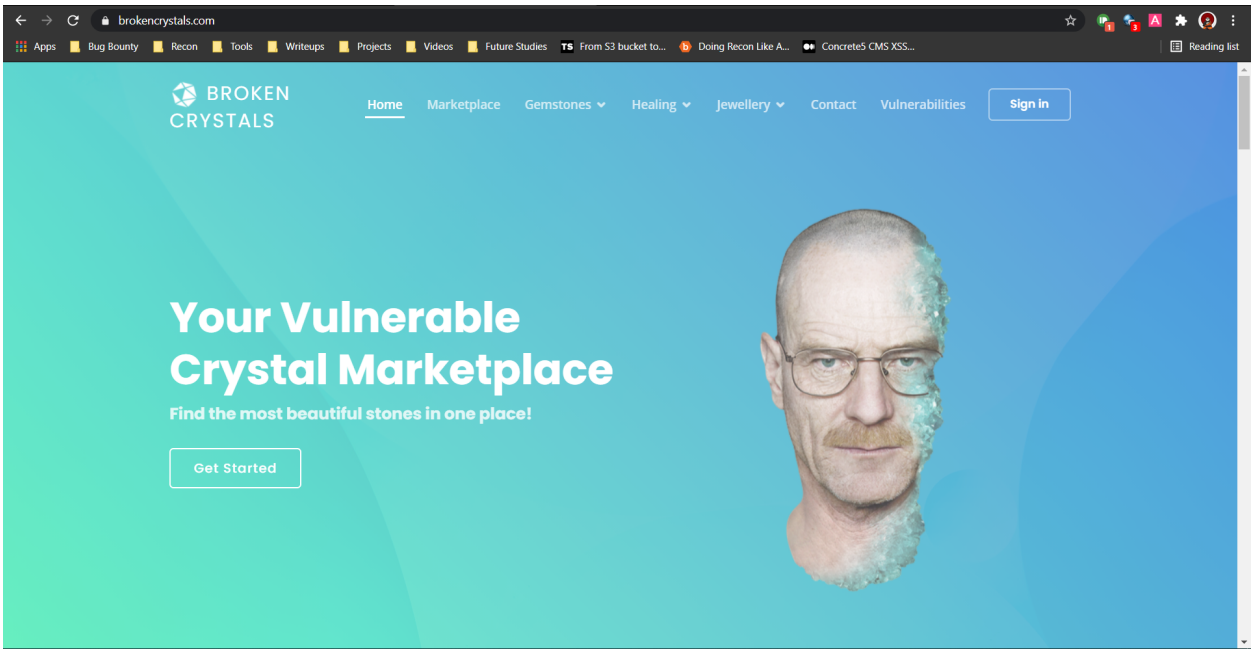
What is EXIF Data Exposure?

EXIF Data stores sensitive information like Geo-location, Date, Name of the camera, Modified date, Time, Sensing Method, File Source, Type of compression etc. in the photos you click. Now this data resides in the every photo you take using cameras.

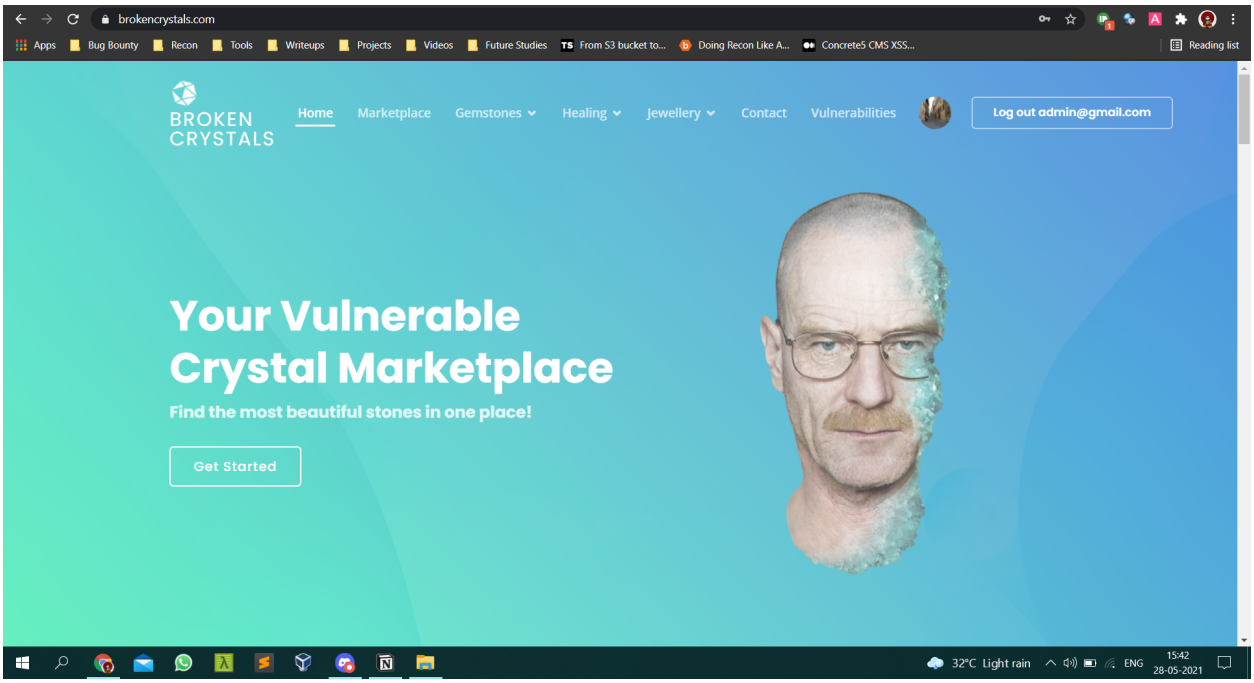
Whenever you upload a picture on a website and if the website does not strip these sensitive data then this could lead to sensitive data exposure like the Geo-location, Date of the photo, Time of the photo, Camera used etc.

Let's understand using an example

So currently I am on a vulnerable website which is: `https://brokencrystals.com`

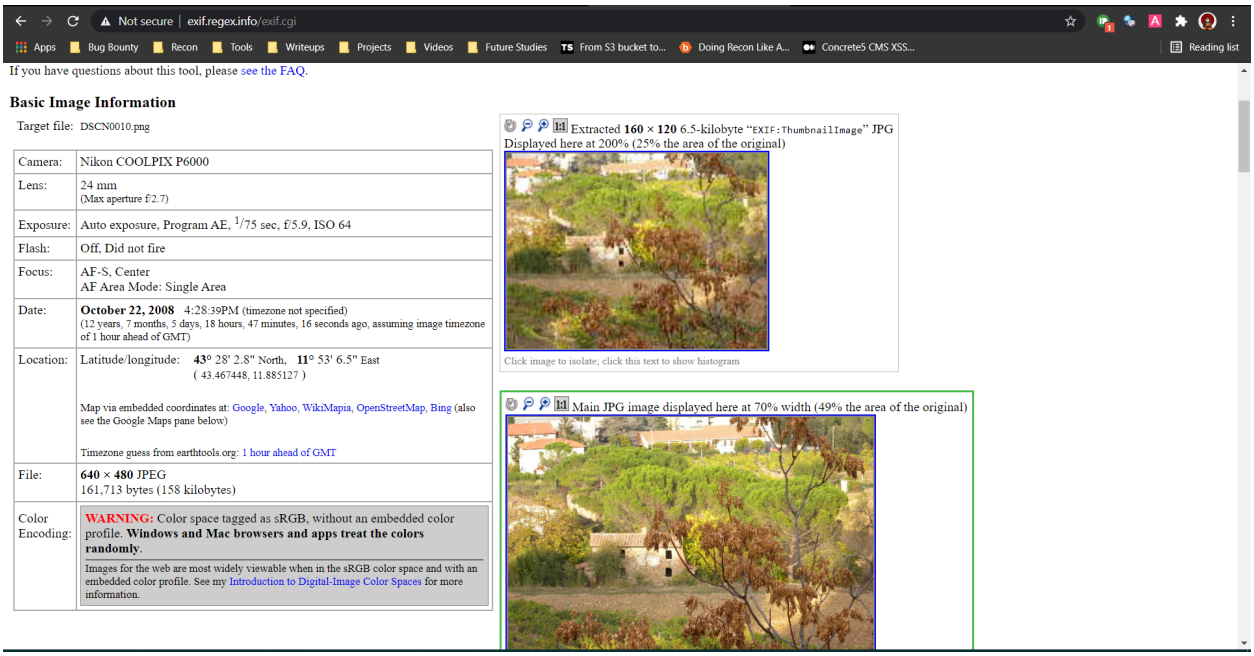


Let's quickly Sign In!



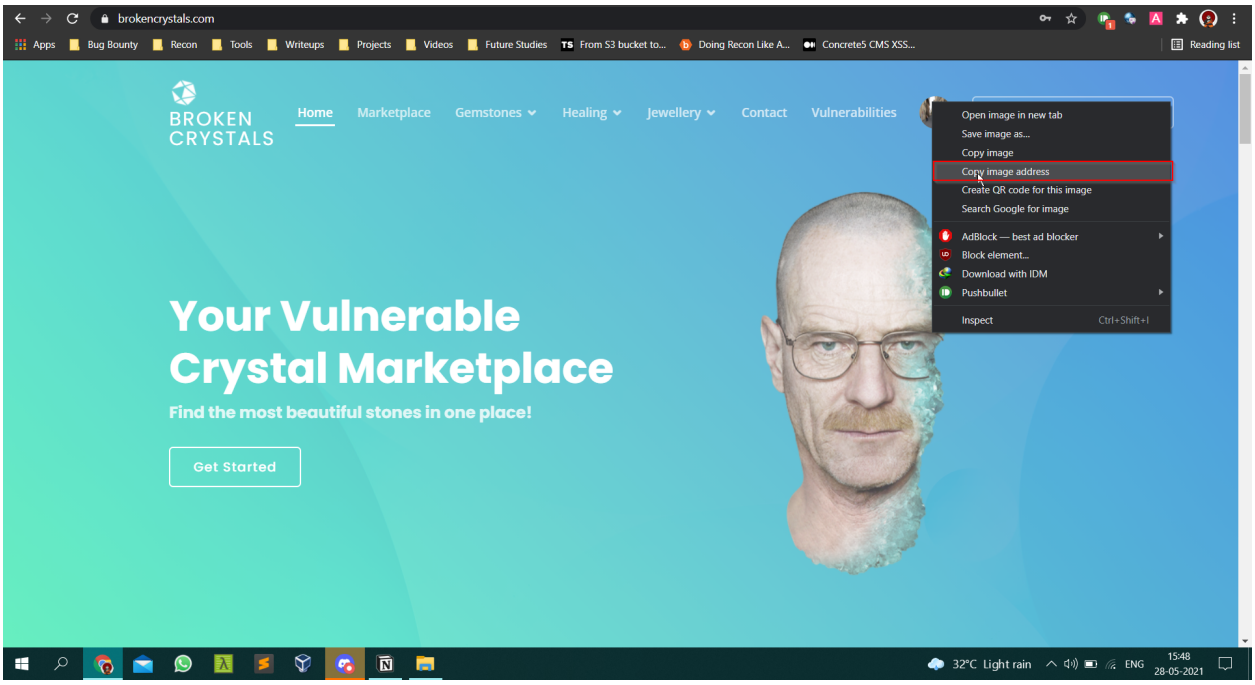
Notice we can upload an image! Let's quickly upload an image which contains some sensitive meta-data to check if web application strips meta data is being stripped or not.

But before uploading let's check out what sensitive data our image contains. You can do this by simply visiting `http://exif.regex.info/exif.cgi` and uploading your image or pasting the URL link.

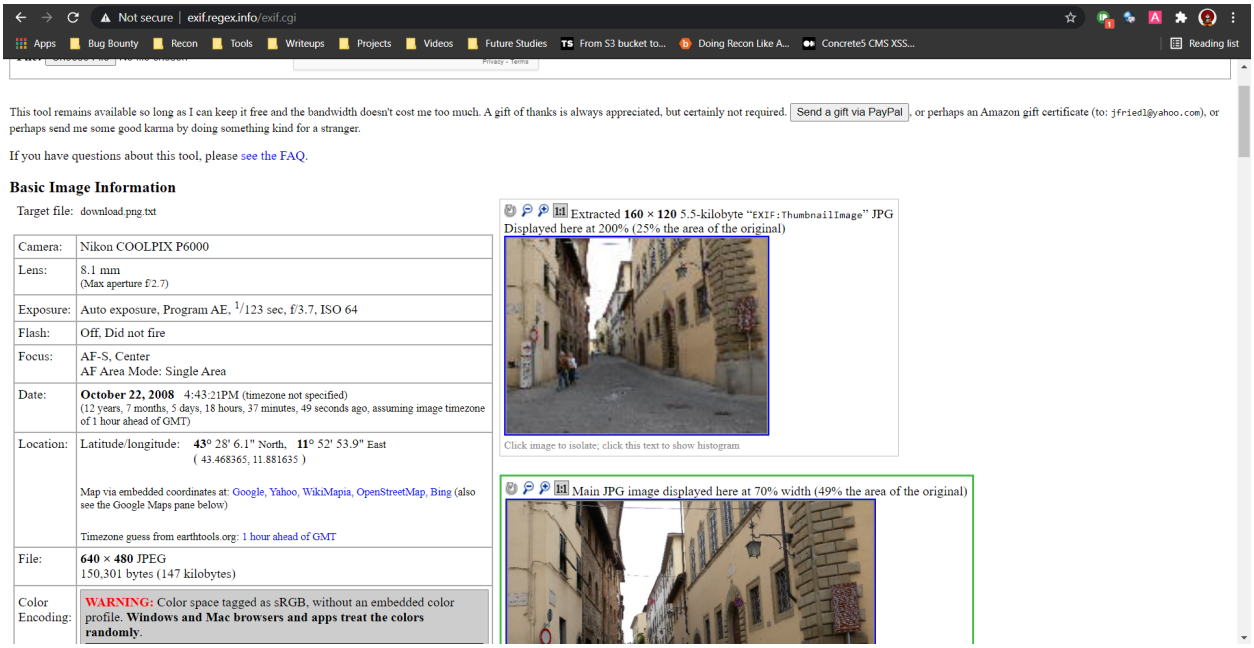


Woah! This image contains our Camera Name, Lens used, Location and a lot more sensitive details!

Quickly! Let's upload the image on the vulnerable website and check if it strips these data or not!



Once uploaded, Right Click on the image and click on `Copy image address` . Alternatively you can `Save Image` and then upload it on `http://exif.regex.info/exif.cgi`



Notice all sensitive data was not not stripped from the image. This makes the web application vulnerable to EXIF Data Exposure.

Exploiting EXIF Data Exposure

Exploiting EXIF Data Exposure is very simple. You just need to find an entry point where in you can upload an image. Such entry points can usually be in `User Profile Image` or `Comments` field which allows you to add files.

The steps to exploit this vulnerability are:

- Find an entry point for uploading an image
- Upload image containing sensitive EXIF meta data. You can find such images on `https://github.com/ianare/exif-samples`
- Once uploaded, either `Copy Image Address` or `Save the Image`
- Go to `http://exif.regex.info/exif.cgi` and paste the link or upload the image.

- Click on `View Image Data` and it will give you the EXIF metadata of that image (if the data is not stripped by the server).

Severity

The severity of EXIF Data Exposure depends on two cases

1. Automatic User Enumeration P3 severity
2. Manual User Enumeration P4 severity

Automatic User Enumeration means the image you have uploaded is visible to public.

Manual User Enumeration means the image you have uploaded is not visible to other users.

Impact of EXIF Data Exposure

This vulnerability violates the privacy of a User and shares sensitive information of the user who uploads an image on the vulnerable website.

Prevention of EXIF Data Exposure

To prevent EXIF Data Exposure you can do the following:

- Disable geotagging on the digital device you use to take photographs
- Use an image processing software or EXIF data remover tool to delete metadata

References

- EXIF Data : https://photographylife.com/what-is-exif-data
- EXIF Data Information Leakage: https://beaglesecurity.com/blog/vulnerability/exif-data-information-leakage.html