CC PROJECT REPORT -2020

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Introduction

- Research Report on Security and privacy issues in the e-health cloud-based system.

The recent advancement in Information and Communication Technology (ICT) has undoubtedly improved services in all sectors in the world. Specifically, Information Technology (IT) has led to a very vital innovation in the health sector called electronic health (e-Health). Cryptographic and non-cryptographic approaches have been used on several occasions to ensure the preservation of **security and privacy** of **health** data in **cloud computing**. Also, fine-grained as well as patient-centric access control schemes are commonly being used to achieve **privacy** in **electronic health**.

- Project on deploying a website
  - Sketch It website
    - It is a flask web framework project. This website recreates a normal image to a sketch image.Frontend: HTML,CSS.
  - I Post
    - It is a Django framework project. It is a social media website used to send posts.Frontend: Bootstrap,HTML,CSS.

Requirements:

- **Flask**
- **CV2**
- **Pillow**
- **Django**
- **Django rest framework**

- **MySQL**
- **Django-crispy-forms**
- **Numpy**
- **Scikit-learn**
- **Requests**
- **scipy**
- **Git**
- **AWS Cloud**
- **AWS Elastic Beanstalk**

Goals

1. Possible Solutions to overcome the security and privacy issues in the e-health cloud-based system.
2. Deployment of two completely resourceful websites using the Amazon AWS cloud.
    a. Sketch It
    b. I Post

Specifications

Research Paper:

This paper is regarding Security and privacy issues in the e-health cloud-based system. After studying many research papers, we came to know that with noticeable and numerous benefits inherent from e-Health in cloud computing, its full utilization is still being hampered by challenges of security and privacy. With recent cloud computing technologies, it is possible to overcome these challenges using cryptography or Key Encryption techniques.

Milestones:

1) Keeping Your Electronic Health Information Secure A few possible measures that can be built into EHR(**electronic health record** is a digital version of a patient's paper chart. **EHRs** are real-time, patient-centered records that make information available instantly and securely to authorized users.) systems may include: "Access control"

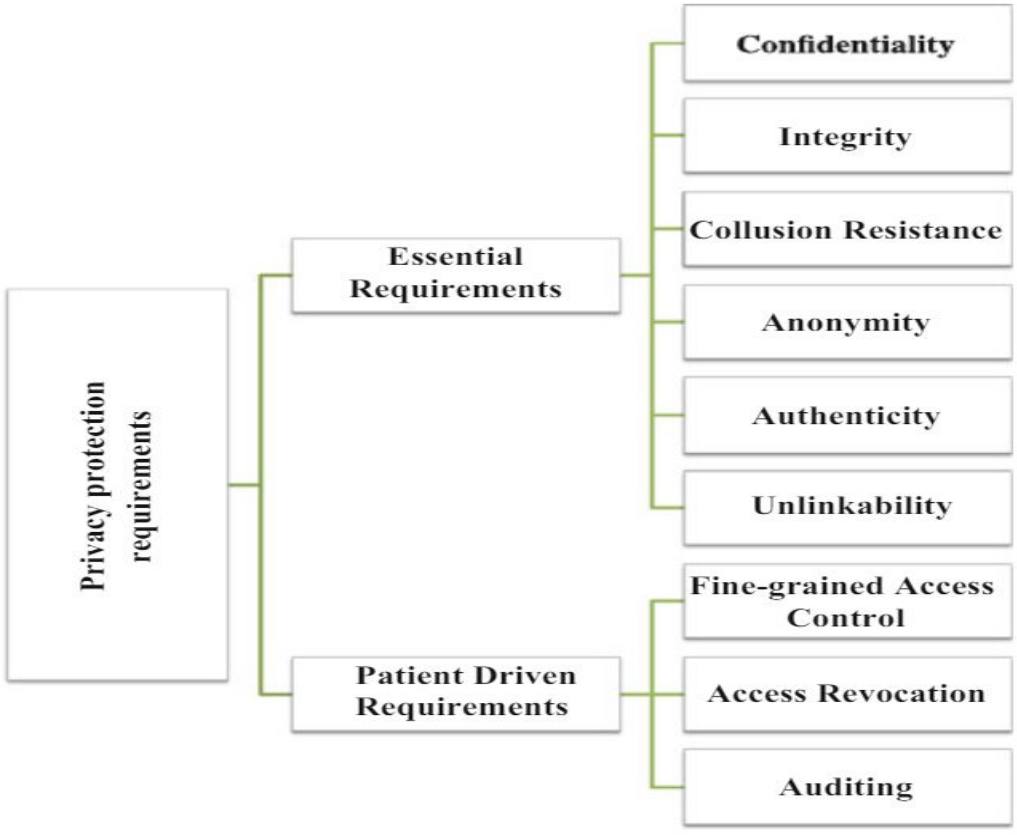
tools like passwords and PIN numbers, to help limit access to your information to authorized individuals. “Encrypting” your stored information.

2) Supporting k-NN query over cryptographically secure cloud data furthermore, the data owner can’t share his key along with query consumers and recommended another resolution with multiple keys to resolving the key sharing issues.

3) RBAC(**Role-Based Access Control**) model to ensure security and privacy in e-Health. We are of the view that the **Attribute-Based Access Control** (ABAC) model should be used to ensure excellent scalability and flexibility for authentications and authorizations.

4) RBAC(**Role-Based Access Control**), MAC(**Mandatory Access Control**), and DAC(**Discretionary Access Control**) models will perform better if they are hybridized to form a single model for ensuring security and privacy in eHealth.DAC is much easier than MAC to implement and maintain, as users can manage access to the data they own.

5) (a) patient-centric access control, (b) access revocation, and (c) auditing.: utilize the Public Key Encryption (PKE), the Symmetric KeyEncryption (SKE), and the El-Gamal cryptosystem. Other cryptographic primitives, such as Attribute-Based Encryption (ABE) and its variants, Identity Based Encryption (IBE), Hierarchical Predicate Encryption (HPE), Proxy Re-encryption(PRE) and Homomorphic encryption have also been used.



Projects:

We deployed a website using the Amazon AWS cloud.

AWS provides a highly available technology infrastructure platform with multiple locations worldwide. We deployed using all-in-cloud based deployment model and using containers.

I. Sketch It

A site used for converting a given image into a photo sketch. This app shows basic deployment functions.

- Deployed using ec2 instance
- Flask
- python
- Computer vision technology is used

Using computer vision libraries in python, the given image will be converted into a photo sketch. Deployment of the website using ec2 instance with the help of Putty, Puttygen, Winscp.

1. The image is converted into grayscale.
2. Grayscale is sharpened.
3. The sharpened image is inverted.
4. The inverted image will be sent to gaussian.
5. The obtained sharpened image and the gaussian image are merged to form a pencil sketch.

Prerequisites:

- `OpenCV`
- `Flask`
- `Pillow`

II. I Post

It is a social media website in which we can post the information to share all over the world. It is used to share data to a long distance so that we can know the information about different corners of the world.

1. We can register/log in using e-mail.
2. We can edit our profile whenever needed.
3. We can post any information and also can see what others post.
4. We can edit/delete the post whenever needed.

This is deployed using Elastic Beanstalk, which is the fastest and simplest way to get a web application up and running on AWS. We manually deployed to the AWS. We used **Amazon Relational Database Service (RDS)**. It provides a fully managed relational database with support for many popular open-source and commercial database engines.

- Set up a Python virtual environment and install Django.
- Create a Django project(I Post).
- Configure your Django application for Elastic Beanstalk.
- Deploy your site with the EB CLI(**create an environment and deploy your Django application**).

Prerequisites:

- **Python 3.6**
- `pip`
- `virtualenv`
- `awsebcli`

Individual contributions:

K V. Navya Sree(S20170010065):

- Studied research papers and resources to make brief notes.
- Complete Final research paper
- I Post project deployment

M.Laxmi Prasanna(S20170010088):

- Studied research papers and resources to make brief notes.
- Complete research Paper

B.Gayatri Shivani(S20170010029):

- Studied research papers and resources to make brief notes
- Sketch It deployment