CSE 543: Information Assurance and Security

Project Proposal

Project Title

Preventing User Identity Theft in Cloud Computing using Blockchain

Group Members

1. Dibbya Barua (Group Leader)
2. Akshay Malhotra (Deputy Leader)
3. Harshita Verma
4. Saidubabu Mallela
5. Keenan Rahman
6. Zeal Patel
7. Christopher Feger

Objective

To understand the state of identity management systems, vulnerabilities of cloud infrastructure, and extent to which blockchain mitigates the problem.

Motivation

According to Alte-Novarica Group, identity theft will cost Americans more than $712.4 billion in 2020.[1] Identity theft is a high-priority problem due to the sensitive nature of the information and ever-evolving landscape of information management. As a user's information is stored on the server side, its security is imperative.[2]

Scope of Study

- Study various encryption technologies and techniques used in blockchain that help ensure security.[3]
- Maintaining privacy while protecting user security and shielding them from central third parties.[4]
- Understanding the dynamics and vulnerabilities of trust relationships for both the cloud service providers and their clients[5]

Expected Major Results

- Comparative analysis of existing decentralized identity management systems.[4]
- Evaluating the suitability of applying blockchain to identity management systems.[6][7]
- Improvement with respect to performance variables associated with identity management systems.[8]
- Fewer number of security-based attacks on a decentralized blockchain data-management system.[9]
- How user identities are vulnerable to malware, phishing, and ransomware attacks.[10]
- Study different methods of preventing identity thefts including public-private keys, private VPNs.
- Impact of blockchain identity management on parameters like cost and maintenance. [11][12]

Responsibilities

Team Member	**Responsibility**
Dibbya Barua	Research and collaborate with Harshita to better understand the limitations of blockchain technology and to get insight into how to enhance current approaches to enhance cloud computing security models from the viewpoint of user-side Identity Theft In addition, work with the Deputy Leader and other team members to arrange weekly meetings, review progress, check for on-time submissions, plan and allocate tasks, and carry out the scheduled duties.
Akshay Malhotra	I will understand the background of multiple domains such as but not limited to cloud computing, distributed systems, blockchain, and identity management systems. Furthermore, this will allow me to comprehend the issues of existing identity management systems (for example, authentication, storage, or networking) and identify potential areas that blockchain can help with. In addition, with the leader's help, I will collaborate with all team members to arrange weekly meetings, delegate tasks, and track the progress of tasks. I will ensure that all submissions are done in a timely manner.
Harshita Verma	I will research and work with Dibbya to determine whether blockchain technology can offer an identity management system that complies with the objectives established for the suggested system. I will also pinpoint the significant issues that blockchain fails to address.

	I will thoroughly research blockchain for this and its identity management-related issues. In addition, I will work with the team to help with report preparation.
Saidubabu Mallela	I will research and collaborate with Keenan and Christopher to understand blockchain technology. I will further research the topic of how blockchain can be used to deal with identity theft in cloud computing along with the approaches used by the blockchain to resolve this problem. I will conduct in-depth research on different types of blockchain as well as all currently in use proposed algorithms and systems. Along with this, I will be participating in report writing with the team. I will cover the headings related to blockchain technology and what are the current state-of-the-art solutions provided by blockchain to solve this problem.
Keenan Rahman	Research and collaborate with Saidubabu and Christopher to understand blockchain technology. I will further research on the topic of how blockchain can be used to deal with identity theft in cloud computing along with the approaches used by the blockchain to resolve this problem. I will study deep in the topic of blockchain and all the proposed algorithms and systems that are currently used as part of resolving this issue. Along with this, I will be participating in report writing with the team. I will cover the headings related to blockchain technology and what are the current state-of-the-art solutions provided by blockchain to solve this problem.
Zeal Patel	Along with Akshay, I will understand the background of Cloud Computing as well as comprehend the Identity Management System in Cloud Computing. Study the challenges in the field of security faced by Cloud Computing. In particular, identify the various types of Identity Thefts that exist in the domain of Cloud Computing. Moreover, transfer my understanding and research in the final project report.
Christopher Feger	I will research and collaborate with Keenan and Saidu to understand how blockchain can be used in cloud computing, focusing on identity theft. I will further research the different implementations of blockchains to understand which would be most helpful for the above, along with a general overview of how they differ. Finally, I will synthesize my findings into the final report.

References

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