

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
HYDERABAD CAMPUS
FIRST SEMESTER 2019-2020
CS F376 : Design Project

PROJECT TITLE & PLAN OF WORK

Date: 31-8-2019

- 1. Title of the project:** Constrained Policy Mining in Attribute Based Access Control Models.
- 2. Need for the study:** In practical access control models, it is important to enforce an upper bound on the time taken to respond to an access request. Using constrained access control mining algorithms we attempt to generate a set of ABAC rules such that the weight of each rule and sum of weights of all rules and hence eventually, the access time is minimized.
- 3. Objectives (Bullet points):**
 - Study about Attribute Based Access Control Model
 - Compare and understand the advantages of ABAC against previous Access Control Models (like RBAC, etc.)
 - Review and understand the algorithms developed for Constrained Policy Mining
 - Attempt to develop/Optimize the algorithms for Constrained Policy Mining using ACMs.
 - Implementation of the aforementioned points.
- 4. Literature Review:** Access Control Mechanism (ACM) is the logical component that serves to receive the access request from the subject, to decide, and to enforce the access decision. With an ever-growing number of roles, RBAC turns to be less efficient and bulky as compared to ABAC. However, with the ever-increasing number of resources, permissions and users, the time of access in ABACs also shoots up quite rapidly. An attempt to generalize and minimize

the set of rules (policies) governing the Users, Resources and Permissions, in order to decrease the access time, is the *Constrained Policy Mining* problem.

5. Work Plan (Include Detailed Methodology with Time Schedule):

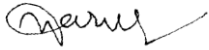
- Research Papers Study: August – Mid September
- Analysis and Design Phase: Mid September to Mid October
- Implementation Phase: Mid October to November

6. References:

- Mayank Gautam, Sadhana Jha, Shamik Sural, Jaideep Vaidya, Vijayalakshmi Atluri Poster: *Constrained Policy Mining in Attribute Based Access Control* (2017)
- David F. Ferraiolo, D Richard Kuhn: *Role-Based Access Controls* (1992)
- Ed Coyne, Timothy R. Weil
ABAC and RBAC: Scalable, Flexible and Auditable Access Management (2013)
- Zhongyuan Xu, Scott D. Stoller
Algorithms for Mining Meaningful Roles (2012)
- Zhongyuan Xu, Scott D. Stoller
Mining Attribute-Based Access Control Policies (2015)
- David Brossad, Gerry Gebel, Mark Berg
A Systematic Approach to Implementing ABAC
- Zhongyuan Xu, Scott D. Stoller
Mining Attribute-Based Access Control Policies from Logs (2014)
- Yan Zhu, Dijiang Haung, Chang-Jyun Hu, and Xin Wang
From RBAC to ABAC: Constructing Flexible Data Access Control for Cloud Storage Services (2015)
- Tanay Talukdar, Gunjan Batra, Jaideep Vaidya, Vijayalakshmi Atluri, and Shamik Sural
Efficient bottom-up Mining of Attribute Based Access Control Policies (2017)

7. Expected Knowledge to be gained after completion of the project (Bullet points):

- Basic understanding about Access Control Models.
- Advantages of ABAC over other Access Control Models.
- Basic understanding about the algorithms for Policy Mining in ABACs.
- Advantages and necessity for *Constrained* Policy Mining algorithms.
- Optimal Implementation knowledge about the above mentioned in a programming language like C++, Java or Python.



Signature of the student

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