

GARD: Generic access Right Delegation framework in collaborative Environment

Abstract- Protection of shared data from unauthorized users is the most challenging problem of cyber security for which different access control models have been introduced. However, to provide flexibility in access control models, access rights are delegated within a single security domain or across multiple security domains for different collaborative activities. To the best of our knowledge, there is no published standard for delegation models. Therefore, organizations are unable to evaluate existing delegation models when they have to choose appropriate solution that best satisfies their business requirements. In this thesis, we have carried out research in two major folds, where one direction includes the comparative analysis of different delegation models. We have done literature survey and presented the taxonomy of delegation model, which classifies and elaborates the different features, concepts and scenarios of delegation. Presented taxonomy has been used, in this thesis, as an assessment criterion for the evaluation of existing delegation models. We have compared these models against our taxonomy. Our presented taxonomy is very useful to understand the basic delegation concepts and may be first step toward standardization process. In second fold of research, we have proposed a generic framework for delegation of access rights. In this fold, we have analyzed that different proposed delegation model are strongly coupled with their specific access control model (ACM). For instance, if organization has deployed Role based Access Control (RBAC) model then it must use Role Based Delegation Model (RBDM). Similarly, Attribute Based Access Control (ABAC) model requires Attribute Based Delegation (ABDM) and so on. However, when organizations need to work in a collaborative environment, their heterogeneous environment in the context of ACMs, makes the delegation process difficult to achieve. To solve this issue, we have proposed a Generic Access Rights Delegation (GARD) framework for collaborative environment. We have considered group-centric Secure Information Sharing (g-SIS) model to develop a collaborative environment. Our framework generates a delegation policy as per underlying ACM of participating organization, dynamically. GARD provides interoperability between different ACMs during generation of delegation policies.