

SPBAC: A Semantic Policy-Based Access Control for Database Query

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Abstract : Access control is an essential safeguard for the security of enterprise data, which controls users' access to information resources and ensures the confidentiality and integrity of information resources [1]. Research shows that the more common types of access control now have shortcomings [2]. In this direction, to improve the existing access control, we have studied the current technologies in the field of data security, deeply investigated the previous data access control policies and their problems, identified the existing deficiencies, and proposed a new extension structure of SPBAC. SPBAC extension proposed in this paper aims to combine Policy-Based Access Control (PBAC) with semantics to provide logically connected, real-time data access functionality by establishing associations between enterprise data through semantics. Our design combines policies with linked data through semantics to create a "Semantic link" so that access control is no longer per-database and determines that users in each role should be granted access based on the instance policy, and improves the SPBAC implementation by constructing policies and defined attributes through the XACML specification, which is designed to extend on the original XACML model. While providing relevant design solutions, this paper hopes to continue to study the feasibility and subsequent implementation of related work at a later stage.

Keywords : access control, semantic policy-based access control, semantic link, access control model, instance policy, XACML

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