Abstract

Access control is a fundamental and essential mechanism to maintain security in ubiquitous computing (UbiComp). Flexibility is an important property for general access control system, which can be achieved by access or authority delegation. Existing delegation mechanisms are "subject-centered"; thus in order to make sure that the unavailability of some users does not prevent the system to be functional; auto-delegation mechanisms are introduced, in particular for emergency-prone environments, such as healthcare, military systems auto-delegation mechanisms are required. Auto-delegation mechanism combines the strengths of delegation systems and "break-the-glass" policies, by stating that the most qualified available user for a resource can access this resource. Further this work is extended by considering availability as a quantitative measure, such that each user is associated with a probability of availability. The main contribution of this paper is to present decision theory based auto-delegation scheme (DTA-d) for UbiComp. UbiComp poses new security challenges while the information can be accessed anywhere and anytime, hence the access control is required to maintain the security in UbiComp, but along with the strong access control, auto-delegation is also necessary to provide flexibility. While performing the auto-delegation, numbers of alternatives are available, among these alternatives selecting one as best is the important issue and this is addressed in this paper. Decision theory is used to select the best
alternative when numbers of alternatives are available and their consequences cannot be forecast with certainty. Using Bayesian decision theory and by applying bay's rule access is granted or denied for particular subject to object.

References

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Decision Theory based Auto-delegation (DTA-d) scheme for Ubiquitous Computing


Index Terms

Computer Science

Algorithms

Keywords

Access Control  Ubiquitous Computing  auto-delegation  Decision theory