Time dependent policy-based access control

Access control policies are essential to determine who is allowed to access data in a system without compromising the data's security. However, applications inside a distributed environment may require those policies to be dependent on the actual content of the data, the flow of information, while also on other attributes of the environment such as the time. In this paper, we use systems of Timed Automata to model distributed systems and we present a logic in which one can express time-dependent policies for access control. We show how a fragment of our logic can be reduced to a logic that current model checkers for Timed Automata such as UPPAAL can handle and we present a translator that performs this reduction. We then use our translator and UPPAAL to enforce time-dependent policy-based access control on an example application from the aerospace industry.