CHAPTER 7

CONCLUSION AND FUTURE WORK

7.1 CONCLUSIONS

In this research work, new algorithms for mapping the XACML policies and rules into relational rules, and storing them in the form of rules in temporal relations, to ease the access control to the XML documents, are proposed.

Moreover, a new time-stamp based algorithm for decrypting the encrypted XML documents partially is proposed. This proposed algorithm utilizes a new temporal model for XML representation, based on a combination of valid time and transaction time, through the tuple time-stamping, and one selected attribute of the key components of the encrypted elements to distinguish among them.

7.1.1 Conclusions on the Mapping Algorithm

The new algorithms proposed in this work, for mapping the XACML policies and rules into relational rules help to represent the rules in relational format. Moreover, the rules designed for the temporal relations are useful to control the access to the XML documents effectively. These proposed algorithms help the users by relieving them from the complexity of the XACML structure, and also allow them to efficiently control the access to the XML documents, leading to reduction in their time and effort. From the experimental results obtained from this work, it is clearly proved that, the
proposed algorithms map the XACML policies and rules effectively. The major advantages of this proposed work are:

1. It makes the learning and understanding of the XACML policies and rules easier, and hence, it saves the users' time and effort.

2. It secures the access to the XML documents, which are stored in either native or relational databases, applying firing rules pertaining to XACML policies.

3. It applies the constraints of rules, and obligations and provides the response to an access request effectively.

7.1.2 Conclusions on the Decryption Algorithm

The new time-stamp based algorithm proposed in this work, for decrypting the encrypted XML documents partially guides the receiver to decrypt the required parts of the encrypted XML documents, instead of decrypting all the parts of them. This proposed algorithm utilizes a new temporal model for XML representation, based on a combination of valid time and transaction time as the tuple time-stamping. Moreover, one attribute of the encrypted elements is selected as one of the key components to distinguish among them. The proposed algorithm not only reduces the decryption time, but also protects the security of the data.

The new temporal model is proposed not only for the effective representation of the temporal XML documents, but also for providing facilities for encryption and decryption; i.e., the receiver uses the time-stamp and the selected attribute to retrieve the parts that must be decrypted, to contribute to the query results on the encrypted XML documents. Moreover, this model uses the valid time and transaction time for time-stamping, and
hence, can maintain the history data efficiently. This model can be used to develop secure temporal applications.

7.2 FUTURE WORK

Many future enhancements to this work are possible. Among them, proposal of techniques for Detecting XACML policies and conflicts with respect to a combination of a target, a subject, a resource, an action, and other environment attributes, is an important suggestion for future work. In addition, mobile agents can be deployed to improve the access control by monitoring the applications or policies.