

Autonomic Trust Agent (ATA) Protocol

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Currently, exchanging data between different systems running on different SOA platforms in a secure fashion is a critical issue in most of the applications. The project that we are undertaking is aimed at solving this problem of data communication among different SOA suites and establishing interoperability in a trustworthy fashion.

While setting up the communication between different agents, a lot of challenges have been faced. The vendor specific implementations of web services make it hard to set up the interactions between these web services based on different vendor platforms. A simple example will be the inability of web services implemented in .NET to communicate with web services implemented in Java. Thus the data exchange between these systems via web services become near impossible. Furthermore, due to changing standards and different ways of implementing SOA concept adopted by different suites, setting up interoperability becomes a massive challenge.

Also, hardly any work has been undertaken till now in making different ESBs a part of common network and establishing interaction between them. A lot has been talked about the agents in the grid network but nothing substantial has been put forward in terms of SOA implementations. Moreover, the handling of semantic differences between systems and web services has been a long standing issue. The simple example can be thought of in the e-commerce application. While one system may refer to the object being sold as "Instrument", the other system may refer to the same object as "Equipment". Also, there may be difference in data types in different systems referring to similar entities. Furthermore, the trustworthiness of ESB in the network is another big issue that needs to be taken care of while establishing interaction. A lot of work has been done in the recent past in calculating the trust value of different entities in the grid to maintain trustworthy and secure interaction. Our work capitalizes on the past work to give a new integrated approach to establish trust based secure interactions.

The main goal of our project is to use autonomic approach and tackle the challenges that we have just discussed. The architecture that we have come up with involves creation of special agent software called Autonomic Trust Agent (ATA). Every ESB in the network will have the ATA agent attached to it. The ESB and ATA agent together will form the communication agent in the network. While interacting with each other, the ESB will communicate via this ATA agent to ensure trust based interaction.

The ATA agents use the fundamental strength of the SOA framework to establish the interoperability. An ATA agent takes up every issue and tries to solve the same with SOA architecture into consideration. Moreover, we are also developing methodologies that can be integrated with the ATA to make the interactions secure.

