Security conscious ai-planning based composition of semantic web services

Abstract

**Purpose** – Automated composition of semantic web services has become one of the recent critical issues in today’s web environment. Despite the importance of artificial intelligence (AI)-planning techniques for web service composition, previous works in that area do not address security issues, which is the focus of this paper. The purpose of this paper is to propose an approach to achieve security conscious composition of semantic web services. **Design/methodology/approach** – The proposed approach called security conscious composition of semantic web services (SCAIMO) is based on the prior work, i.e. AIMO. The AIMO is an effective approach for web service discovery and composition based on AI-planning, web service modeling ontology (WSMO), and description logic (DL). In this paper, definitions of secure matchmaking and web service composition are formalized based on DLs. Moreover, security capabilities and constraint types in the proposed SCAIMO framework are presented. **Findings** – This paper proposes a secure task matchmaker which is responsible for matching security conscious tasks with operators and methods based on WSMO and DL to support the proposed SCAIMO framework. In addition, the paper implements and evaluates the SCAIMO using a test case and the result shows that the approach can provide an applicable solution. **Originality/value** – The key contribution of this paper encompasses the new framework to support security capabilities and constraints during composition of semantic web services as well as the new secure task matchmaker.