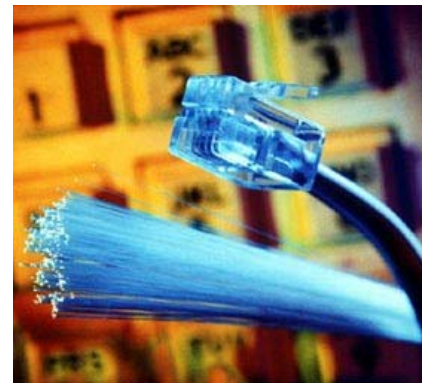


Lock-Keeper Web Services Gateway for Advanced Management and High Security of Service-oriented Applications

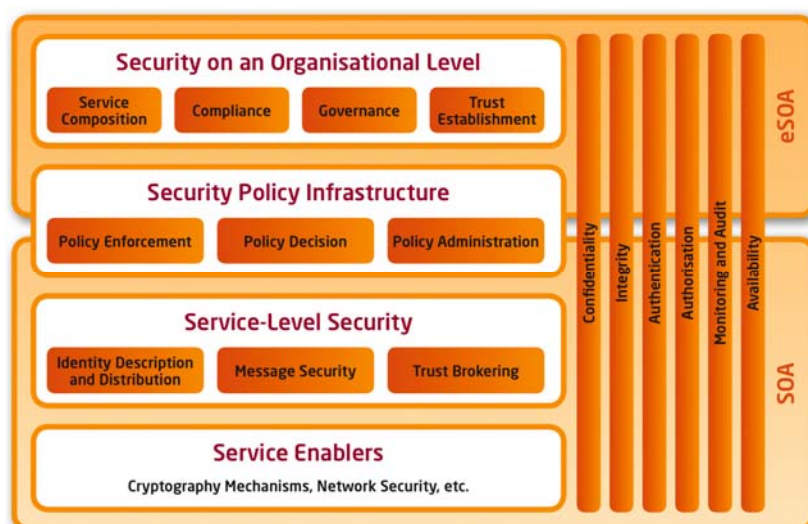
Introduction

Web Services (WS) have been adopted as an efficient way for application integration and constitute a suitable foundation to realize a Service oriented Architecture (SOA). More and more enterprises have joined into this modern business world and implement complex business processes by a multitude of independent services, each providing only a part of the overall functionality. Organizations may use different services for the same functionality depending on their availability and may include services hosted by other companies belonging to different trust domains.



However, to provide their own Web Services, communicate with partners for composing integrated Web Services, or even consuming Web Services, enterprises have to open their networks and expose their internal sensitive resources. Currently, firewalls are usually deployed to protect the internal networks. Unfortunately, these firewalls can not satisfy all the security requirements of SOA applications, since traditional approaches are based on the filtering of the TCP/IP packets which are not able to provide a complete separation of the networks. Since Security at the network layer is not sufficient to secure interactions in the scope of SOA, a solution is needed that provide message-based security and provide integration with IAM (Identity and Access Control) management systems.

Therefore, we propose to implement a Lock-Keeper Web Services Gateway (LK-WSG) based on Axis2 in this bachelor project. Based on the principle that "the ultimate method to secure a network is to disconnect it", the Lock-Keeper technology has been convinced to be an efficient implementation of application layer gateway to guarantee the high-level security and prevent online network attacks by physically separating the protected hosts or network



from the external world. The general goal of this project is to deploy Lock-Keeper in SOA applications to enhance the security of involved enterprises' internal networks. The Web Services Gateway should check and verify communication at the messaging layer. In addition, this solution

should facilitate the establishment and management of identity federations (e.g. based on WS-Federation or SAML) to enable the secure usage of services across different organisations.

Within this project, many technical issues, concerning security, reliability, quality of service, communications compatibility, etc., need to be addressed. Some related mature security products can be used as good references (e.g. Sun Access Manager, Microsoft CardSpace, OpenID, etc).

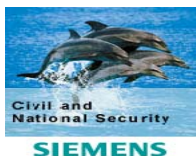
Task List

- Investigate Web Service Technology and related Specifications, e.g. SOAP, WSDL, UDDI, WS-Policy, WS-Security, WS-Federation, WS-Trust, SAML... Study existing implementations of these Service Security standard, e.g. Axis2 Rampart ...
- Analyze requirements and models of SOA Security and propose new approaches for secure services management, including Services description, composition, publication and consuming...
- Investigate Application layer Gateway technology: overview, typical usages, application scenarios, vulnerabilities ... Analyze and model existing Application Gateway Implementations.
- Remodel existing Lock-Keeper application modules and develop an advanced IAM-integrated LK-WSG
- Build a simulated SOA testing environment, according to a specific practical application scenario, using the proposed Lock-Keeper WSG.

Requirements and what you can learn

- Knowledge on security theories and techniques: authentication, authorization, access control, PKI, identity management, SSO etc.
- Basic knowledge on Web Services related technologies: SOAP, WSDL, UDDI, WS-Policy, WS-Security, WS-Federation, WS-Trust, Axis, SOA architecture, etc.
- Good programming skill on Java, C/C++ or .Net.

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