CYBERTECH PUBLISHING

ITB15202

701 E. Chocolate Avenue, Suite 200, Hershey PA 17033-1240, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.igi-pub.com

This paper appears in the publication, **Cryptography and Security Services: Mechanisms and Applications**
authored by **M. Mogollon © 2008, IGI Global**

Chapter XIII

Web Services Security

Web Services Security

A service is an application offered by an organization that can be accessed through a programmable interface. Web services allow computers running on different operating platforms to access and share each other's databases by using open standards, such as extensible markup language (XML) and simple object access protocol (SOAP).

In this chapter, the following Web services mechanisms are discussed: (1) XML encryption, XML signature, and XML key management specification (XKMS); (2) security assertion markup language (SAML); and (3) Web services security (WS-security).

Objectives

- Understand how XML and Web Services are used
- Discuss how corporations could use Web Services
- Be able to explain the different types of security mechanisms in Web Services
- Understand, at a basic level, the point of implementation of XML encryption, XML digital signature, SAML, and WS-security
- Be able to demonstrate how assertions and security tokens are used in Web Services
- Understand the language syntax of XML, SOAP, and WS-Security.

Web Services

A service is an application offered by an organization that can be accessed through a programmable interface. It could be as simple as selling a movie ticket, allowing a passenger to select a seat on a flight, or letting suppliers access inventories to reduce inventory-related costs. Companies used point-to-point communications to integrate their applications by connecting business partners and customers; performance was improved by designing those applications as services that ran on centralized application servers. Travel agencies, for example, had software from different airlines installed in their systems so they were able to access the airlines reservation systems. Because the reservation systems were designed as object-oriented programming, which bonded data and processing together, if the travel agency wanted to sell airline tickets from several airlines, it needed different software for each airline.

Distributed computing protocols such as DCOM, CORBA, Distributed Smalltalk, and RMI were developed for services to agree on programming languages and shared context. Each of these protocols was constrained by vendor operability because they were built as silos. Further, none of these protocols operated effectively over the Web. With distributed computing protocols, software was developed for travel agencies to buy airline tickets from any airline, but it was still necessary to have another software to make hotel reservations or to rent a car.

Service oriented architecture (SOA) is also about distributed computing, but it provides a way to create sets of services and with such granularity that each service can be invoked, published, and discovered. With SOA, only one software is necessary to buy airline tickets or to rent a car, but SOA does not use standard Internet protocols.

Web services represent the convergence between service oriented architecture (SOA) and the Web; it takes all the best features of SOA and combines them with the Web. Unlike some software that is accessed via proprietary protocols, Web services are accessed via ubiquitous Web protocols. As a result, it is possible to go to a Web site and purchase a ticket, make hotel reservations, and rent a car.

The common aspect of all these services is that the information resides in databases, and all these databases are stored in specialized data servers, using proprietary formats that make them difficult to access or to connect to other databases. Even Web servers are only accessible through hyper-scripting languages.

Web services allow computers running on different operating platforms to access and share each other's databases by using open standards such as extensible markup language, XML, and simple object access protocol, SOAP. A Web service is an application, identified by a uniform resource identity, capable of being defined and located, as well as of interacting with other software applications.

By using common standards, Web services can make databases available across the Web; they unlock the databases and make their information available to other databases, workstations, or kiosks. The information can be used by other departments within a company, as well as by customers, vendors, suppliers, or the public in general. True application sharing requires a server-to-server (S2S) access.