

## **WEB SERVICES SECURITY: Architectures, standards, and patterns**

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### **Abstract**

Web services architectures introduce several new architectural levels (including business, cataloging, storage, and transmission levels). All these levels affect the security of web services. The underlying supporting levels (web servers, DBMS and OS) have also a significant effect. There are many standards about the security of web services and this proliferation is contributing to decrease rather than increase their security. We need improved ways to build systems using web services. Analysis and design patterns are well established to build object-oriented software. Web services are loosely-coupled distributed systems and the variety of architectural patterns that has been developed for distributed and networked systems is applicable to their development. Security patterns can be combined with architectural patterns to produce secure distributed systems architectures. We show examples of this combination of patterns, including patterns for SAML-based distributed role-based access control, XML firewalls, and XACML. Expressing standards as patterns makes them clearer and help compare different standards. These patterns are shown using UML and are part of a secure systems development methodology.

### **Biography**

Eduardo B. Fernandez is a professor in the Department of Computer Science and Engineering at Florida Atlantic University. He has published numerous papers on security and object-oriented design. He has also written three books on these subjects. His book on security patterns will appear soon. He has lectured all over the world at both academic and industrial meetings. He has created and taught several courses and industrial tutorials. His current interests include security patterns and web services security. He holds a MS degree in Electrical Engineering from Purdue University and a Ph.D. in Computer Science from UCLA. His industrial experience includes eight years at IBM Corp. and consulting for IBM, Allied Signal, Motorola, Harris, Lucent, Panasonic, and others.