Chapter III

Web Services Enabled E-Market Access Control Model

Harry Wang, University of Delaware, USA

Hsing K. Cheng, University of Florida, USA

Leon Zhao, University of Arizona, USA

Abstract

With the dramatic expansion of global e-markets, companies collaborate more and more in order to streamline their supply chains. Small companies often form coalitions to reach the critical mass required to bid on large volume or wide ranges of products. Meanwhile, they also compete with one another for market shares. Because of the complex relationships among companies, controlling the access to shared information found in e-markets is a challenging task. Currently, there is a lack of comprehensive access control approaches that can be used to maintain data security in e-markets. We propose to integrate several known access control mechanisms such as role-based access control, coalition-based access control, and
relationship driven access control into an e-market access control model (EMAC).
In this chapter, we present a Web services-based architecture for EMAC and the
associated concepts and algorithms. We also illustrate, via an automotive e-market
example, how the EMAC model can support e-market access control.

Introduction

Aimed to make business contact and transactions easier and more cost effective,
e-markets have emerged in several industries. For instance, Covisint, an e-market
owned by a group of the biggest auto manufacturers, is anticipated to handle $240
billion per year, which is greater than the GDP of Sweden (Feldman, 2000). Many
companies have begun the evolution from traditional business practices to e-busi-
ness to strengthen customer service, streamline supply chains, and reach existing
and new partners.

E-markets open up new possibilities of trade by providing various tools and ser-
vices. E-catalogs and sourcing directories help both suppliers and buyers increase
market visibility, shorten processing time and easily locate business partners (Baron,
Shaw, & Bailey, Jr., 2000). E-auctions make prices more dynamic and responsive
to economic conditions (Feldman, 2000). Scrutiny of the participating companies
by e-markets increases the trust between trading partners and makes the establish-
ment of new business relationship easier. Process collaboration tools help compa-
nies integrate their processes, which simplifies the work and avoids duplications
(eMarket Services, 2002).

As e-markets develop and offer more advanced services, many serious challenges
have been presented. Among those challenges, security has been highlighted as a
critical issue that must be dealt with. Businesses generally perform controls over
the internal use of their business processes. In the e-market environment, this con-
trolled access must be extended to outside the company boundaries (Medjahed,
Benatallah, Bouguettaya, Ngu, & Elmagarmid, 2003). Depending on the business
situation, participating companies may want e-markets to hide their identities, cur-
rent trading positions, sensitive catalog items, history, or ongoing activities with
other players (Feldman, 2000). This gives rise to the need for advanced access
control mechanisms.

Although there have been many research efforts in access control in recent years
(Joshi, Aref, Ghafoor, & Spafford, 2001), there is a lack of comprehensive methods
that can be used directly in the context of e-market access control. We propose to
integrate several existing access control models to meet the needs of data security
in the presence of complex relationships among companies that participate in an
e-market, which we refer to as e-market access control model (EMAC). Among
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