Security Middleware Infrastructure for Medical Imaging System Integration

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Abstract—**With the increasing demand of electronic medical records sharing, it is a challenge for medical imaging service providers to protect the patient privacy and secure their IT infrastructure in an integrated environment. In this paper, we present a novel security middleware infrastructure for seamlessly and securely linking legacy medical imaging systems, diagnostic imaging web applications as well as mobile applications. Software agent such as user agent and security agent have been integrated into medical imaging domains that can be trained to perform tasks. The proposed security middleware utilizes both online security technologies such as authentication, authorization and accounting, and post security procedures to discover system security vulnerability. By integrating with the proposed security middleware, both legacy system users and Internet users can be uniformly identified and authenticated; access to patient diagnostic images can be controlled based on patient's consent directives and other access control polices defined at a central point; relevant user access activities can be audited at a central repository; user access behavior patterns are mined to refine existing security policies. A case study is presented based on the proposed infrastructure.**

Keyword—**Security; Middleware; Agent; Medical Imaging; Behaviour Pattern; Access Control**

Weina Ma was born in Baoding/China, in 1982. She obtained her B.Sc. and M.Sc. both in computer and software engineering from Northwestern Polytechnic University in Xi'an/China, in 2005 and 2008, respectively. She started Ph.D study in software engineering in University of Ontario Institute of Technology in Oshawa/Canada from 2013. Her major research interests are knowledge engineering and data mining, eHealth services, and high performance computing and cloud computing.

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