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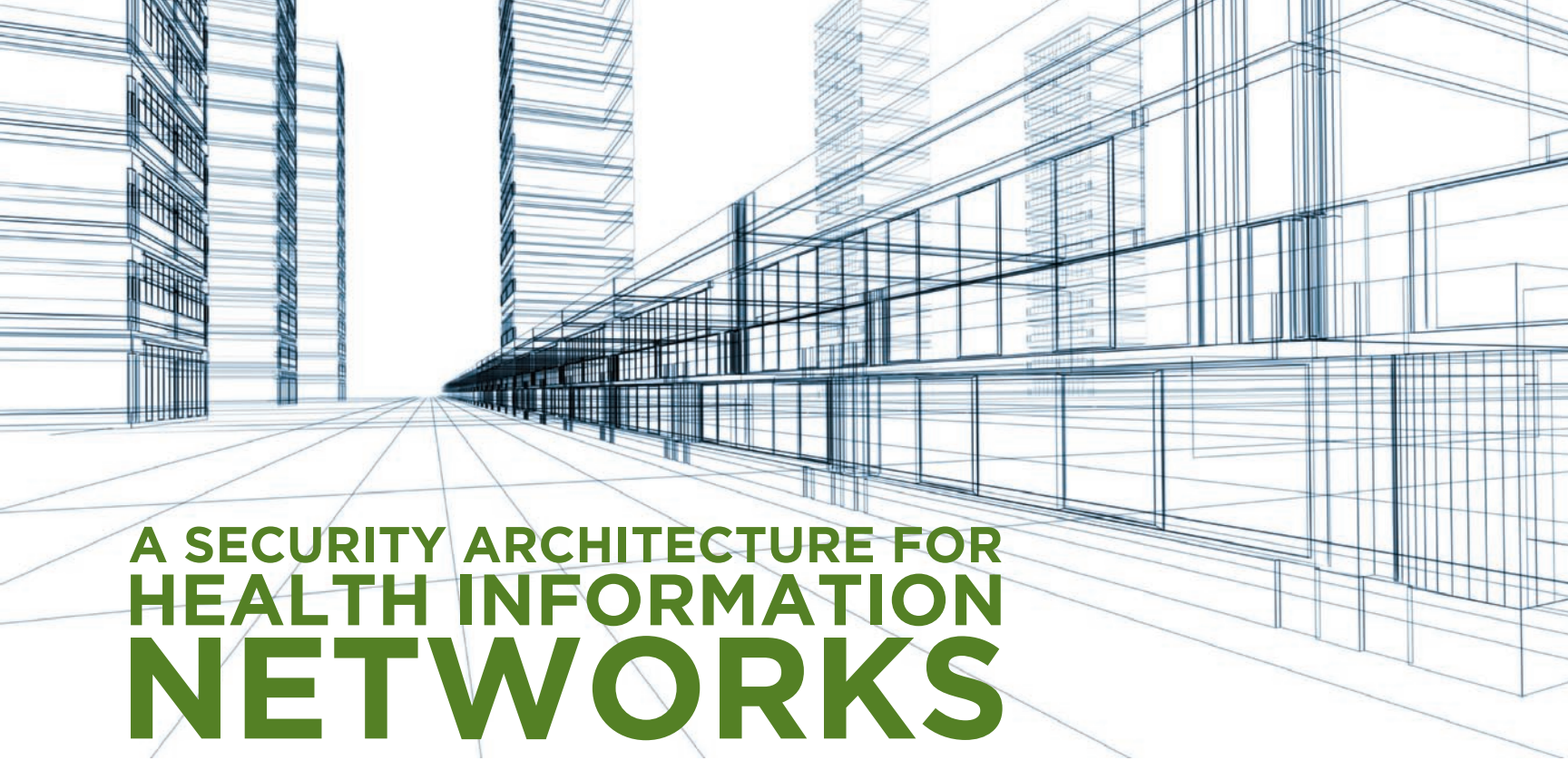
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A Security Architecture
for Health Information Networks



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A SECURITY ARCHITECTURE FOR HEALTH INFORMATION NETWORKS

by Rajashekar Kailar and Vinod Muralidhar

As healthcare providers increasingly adopt interoperable electronic health record (EHR) systems, the overall quality of healthcare is expected to improve. Electronic records will provide easier access to accurate patient health information, decrease costs through more efficient use of resources, and reduce medical errors by automating the detection of mistakes in human-entered data.

To realize these benefits on a large scale, healthcare organizations need to link their EHR systems into interoperable health information networks (HINs). Also referred to as health information exchanges (HIEs), such networks are a vital part of the large-scale investment in healthcare IT being planned in the United States. Ensuring the security and privacy of clinical information is, however, recognized as a significant challenge for data exchange among disparate enterprises, especially over public networks such as the Internet.

Given the currently limited adoption of EHR systems, HIN architectures need to find the right balance between stringent security controls and ease of implementation. While it is crucial that data communications be highly secure and mindful of patient privacy, a pragmatic approach to information security would dictate that the technology require-

ments be not so complex as to inhibit network growth.

Our paper defines a security architecture that provides guidance for emerging HIEs in implementing secure clinical data exchange. The architecture is based on a recent CSC project to develop a nationwide health information network (NHIN) architecture prototype for the U.S. Department of Health and Human Services. Our proposed architecture is derived from the goals of HIN security, which are defined in the context of essential services that a HIN supports.

These goals include protecting patient data privacy by empowering individuals to control access to their own healthcare information; allowing only fully authenticated and specifically authorized individuals to access data; and holding users and organizations accountable for all actions on the network. Each node

(organization) in a network will also need to be held accountable for security of the data in its custody, as well as preserving integrity of data sent over the network and enabling the formation of larger-scale networks by securely linking together HIEs.

With these objectives in mind, our paper proposes a security model for HINs and a minimum set of mechanisms needed to address network security requirements. These mechanisms are shown to counter security threats to clinical information shared over a public network. Our proposed set of security controls provides a simple and convenient framework for HINs to design and implement their security architecture. Many of the components of the network security architecture are implemented through infrastructure commonly used by healthcare enterprises to connect to the Internet. ■

Download the full paper at www.csc.com/HINsecurity.

RAJASHEKAR KAILAR, Ph.D., is chief technology officer at Business Networks International Inc.

VINOD MURALIDHAR is a partner in CSC Consulting.



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TECHNOLOGY
OUTSOURCING

Worldwide CSC Headquarters

The Americas

3170 Fairview Park Drive
Falls Church, Virginia 22042
United States
+1.703.876.1000

Europe, Middle East, Africa

Royal Pavilion
Wellesley Road
Aldershot, Hampshire GU11 1PZ
United Kingdom
+44(0)1252.534000

Australia

26 Talavera Road
Macquarie Park, NSW 2113
Australia
+61(0)29034.3000

Asia

139 Cecil Street
#06-00 Cecil House
Singapore 069539
Republic of Singapore
+65.6221.9095

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