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LLNL-TR-741112

Public Key-Based Need-to-Know Authorization Engine Final Report CRADA No. TSB-1553-98

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Public Key-Based Need-to-Know Authorization Engine

Project Accomplishments Summary
CRADA No. TSB-1553-98
Date Technical Work Ended: September 1999

Date: June 27, 2001 Revision: 4

A. Parties

The project involved a relationship between the Lawrence Livermore National Laboratory (LLNL) and DASCOM, Inc. DASCOM was subsequently acquired by International Business Machines Corporation (IBM).

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B. Background

DASCOM was a provider of Internet and Extranet security products. Their IntraVerse product provided a centrally managed authentication, authorization, auditing, and data privacy (encryption) service. The authorization service is extensible and integration with the LLNL's existing NTK authorization system has been demonstrated. The IntraVerse model supports authorization and authentication of users distributed to the desktop.

DASCOM also provided management tools for the Distributed Computing Environment (DCE). DCE is an open system's standard from The Open Group [formerly the Open Software Foundation (OSF)] and is a strategic middleware component for the labs.

DASCOM also provided trusted (B1 compliant) operating systems for Intel-based systems.

DASCOM's IntraVerse provided a means by which public key-based authentication could be used with DASCOM's IntraVerse Authorization Service and with LLNL's existing NTK authorization service.

By moving to a public key-based authentication mechanism, LLNL would ensure that authentication and authorization services were supported at a client or desktop basis and not on a network topology basis. However, the Public Key Infrastructure (PKI) used to support the distribution and management of public key certificates was a rapidly evolving and immature area. By working with DASCOM, LLNL would ensure that the PKI support provided by DASCOM met the current and future needs of the labs. Note that DASCOM provided the following PKI support in their products:

- Direct support for PKI authentication in the DCE runtime. DASCOM worked jointly with IBM, Digital, and The Open Group on developing a specification and reference implementation.

- Integration with commercial PKI products (e.g., Entrust and Verisign, the leading PKI vendors) for certificate management and integration. This integration effort was based on the Common Data Security Architecture (CDSA), which is an open standard developed by Intel, Netscape, IBM, and others and branded by The Open Group.

DASCOM's IntraVerse product also provided a means by which inter-Lab secured extranets could be established. This involved integrating pre-existing authentication and authorization services established at each of the Labs (e.g., Los Alamos, Sandia, Oak Ridge). DASCOM's IntraVerse provided the necessary extensibility features to provide a common layer of authorization services on top of the existing services. By working with DASCOM, the Labs would ensure that the correct integration points were maintained. The IntraVerse model supported authorization and authentication of users at the desktop.

C. Description

The goals of this project were to:

1. Develop a public key-based authentication service plug-in based on LLNL's requirements.

   This plug-in processed X.509 certificates and returned to the IntraVerse authentication service, a set of user credentials. This plug-in service provides support for integration with commercial PKI products through the CDSA-defined interfaces. One commercial PKI product was selected jointly by the Labs and DASCOM to be used in the reference implementation. This provided authentication services to users at their desktops.

2. Integrate the public key-based authentication with the IntraVerse authorization service and the LLNL NTK server by developing a full-featured version of the prototyped IntraVerse need-to-know plug-in.

   This provided authorization services for desktop clients using need-to-know access control and partitioning.

3. Test the authorization and need-to-know plug-in in a secured extranet prototype among selected national Labs.

   This Web-based extranet was used to demonstrate the feasibility of secured information sharing among the different labs. This provided a backbone for the integration of distributed (across multiple labs) information servers. Note that if a multi-lab project is out of the scope of this initiative, a similar LLNL-only extranet can be designed and implemented. The IntraVerse extranet included a sophisticated multimedia content distribution mechanism.

The results of this project were integrated into the commercially available DASCOM IntraVerse product suite. This drove the development and delivery of similar plug-ins to meet the needs of commercial industry sectors such as the financial and manufacturing industries.

Accomplishment	Responsible Party
Requirements Document	LLNL
Final Requirements Document	LLNL
Specifications Document	DASCOM
Final Specifications Document	DASCOM
Alpha code and user doc	DASCOM
Preliminary project report	DASCOM
Deployment lab equipment	LLNL
Beta code and user doc	DASCOM
Final technical report	DASCOM

D. Expected Economic Impact

Industrial Participant:
This joint product helped improve the competitiveness of the DASCOM product by allowing DASCOM the opportunity to deploy and test this new technology in a physical highly secure environment. Such an effort led to an improved product.

U.S. Economy:
This project had the potential of developing new markets and new technologies for security technology.

E. Benefits to DOE

Laboratory Program(s) Core Competencies:
The leveraging of existing authorization serves with state-of-the-art authentication services. This allows the Laboratory to preserve their installed base of need-to-know technology while moving forward with the use of emerging technologies.

DOE Program(s):
The extranet deployment will improve information sharing across the DOE complex.

F. Industry Area

Software

G. Project Status

This project was terminated by the agreement of the parties. LLNL was impacted by work reprioritization due to InfoSec. DASCOM was acquired by IBM Corporation and has taken a different product direction.

H. LLNL Point of Contact for Project Information

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I. Company Size and Point(s) of Contact

As indicated previously, DASCOM has been acquired by IBM.

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Ron Williams
Technical Contact
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Fax: (512) 436-9411

J. Project Examples

There are no project examples.

K. Subject Inventions

This small value contractual mechanism did not anticipate any generation of Intellectual Property (IP) including subject inventions. The LLNL contributors and the company participants both indicate that no new intellectual property was generated.

Documents/Reference List
None

Reports
None

Patent/Copyright Activity
None

Generated Information
None

Background Intellectual Property
None

L. Release of Information

I certify that all information contained in this report is accurate and releasable to the best of my knowledge.

Karena McKinley, Director
Industrial Partnerships and Commercialization
11/9/01
Date

Release of Information

I have reviewed the attached Project Accomplishment Summary prepared by Lawrence Livermore National Laboratory and agree that the information about our CRADA may be released for external distribution.

Ron Williams
IBM Corporation
7.27.2001
Date

Richard Mark
Lawrence Livermore National Laboratory
24 Oct 2001
Date