Information Technology Laboratory Newsletter

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NIST Immunization Test Suite Facilitates Exchange of Immunization Data

The NIST Immunization Test Suite was used recently by the American Immunization Registries Association (AIRA) to report on Nationwide Immunization Registry Interoperability. The NIST Immunization Test Suite, developed in collaboration with the Center for Disease Control and Prevention (CDC) and AIRA, is a cornerstone of the AIRA Interoperability Testing Project.

AIRA formally assessed 21 state Immunization Information Systems (IIS) for conformance with the CDC "Transport Layer Protocol Recommendation Version 1.2" specification for transmitting and receiving patient immunization records. This was an initial baseline snapshot, and assessments were performed again in December 2016 and then every 6 months thereafter. The NIST Immunization Test Suite automates testing of systems to the CDC specification and provides a detailed report of detected conformance issues. States whose IIS were found to be noncompliant with all or part of the CDC specification were sent detailed reports and encouraged to correct the issues. IIS developers are also encouraged to utilize the NIST Immunization Test Suite as part of their development life cycle to ensure conformance with the CDC specification prior to deployment.

AIRA is also using the NIST Immunization Test Suite to test IIS for conformance with the CDC's "Immunization Messaging Implementation Guide Release 1.5," which is itself based on the Health Level Seven International (HL7) standard version 2.5.1. AIRA is using the NIST conformance tooling to assess these IIS for conformant message structure. The NIST tooling automates the testing of HL7-based query, response, and acknowledgement messages. In addition to AIRA, there are several IIS in development that are using the NIST Immunization Test Suite to self-check their own implementations of query and response for conformance with "Immunization Messaging Implementation Guide Release 1.5."

ITL's work promotes trust in the IIS by testing the interoperability between systems exchanging patient immunization records. This results in IIS that provide up-to-date immunization records to healthcare professionals, patients, and parents. IIS can also be used to identify under-immunized children and to monitor immunization rates for a community. ITL researchers Robert Snelick, Harold Affo, Sandra Martinez, Sheryl Taylor, and Michael Indovina contributed to this work.

ITL's Text REtrieval Conference (TREC) Program Celebrates 25 Years

ITL's Text REtrieval Conference program focuses on building the infrastructure necessary for evaluating---and thus improving---the quality of search engines. The TREC 2016 conference, held in November, marked the 25th anniversary of the annual event. Web search engines didn't even exist 25 years ago, so TREC has contributed to unprecedented growth in the search industry over its lifetime. ITL's Ellen Voorhees leads the TREC program.

A one-day celebration was held prior to the TREC 2016 conference to mark the 25th milestone. The celebration consisted of talks and panel discussions reflecting on past accomplishments and looking forward to new challenges. Susan Dumais, Deputy Director of Microsoft Research, gave the keynote talk for the celebration. Other talks recounted the ways in which TREC has influenced web search, legal e-discovery, biomedical applications, and the development of Watson, IBM's Jeopardy!-champion question answering system. An archive of the webcast of the event is available at http://trec.nist.gov/celebration/25thcelebration.html.

ITL Collaborates on Timing Challenges in the Smart Grid

IEEE and three NIST laboratories recently co-hosted a workshop on "Timing Challenges in the Smart Grid." Precision timing—such as one microsecond synchronization to a traceable time and frequency reference—is an issue of growing interest and concern to engineers and scientists working with the smart grid and other cyber-physical systems. The greatly expanded use of synchronous sensors for wide-area monitoring, along with the increasing need for fault detection and location as well as maintaining system stability in real-time using spatio-temporal and temporal-frequency analyses, all require precision timing. These new capabilities offer increased flexibility to grid operators, but they also raise time-related security concerns.

At the workshop, these opportunities and challenges were addressed in a unique forum composed of power system experts, timing experts, and communications experts. The diversity of attendees enabled the workshop to make progress in identifying and analyzing the practical challenges that are currently being experienced in wide-area time synchronization in current measurement and control deployments. Attendees also discussed timing-related barriers that prevent the power industry from realizing future measurement and control technologies.

The outcomes of the workshop will inform a NIST report summarizing the challenges and potential solutions for wide-area clock synchronization as well as prioritizing future R&D and standards efforts in precision timing for power systems and other domains. The webcast and presentations are archived on the workshop webpage.

ITL Diversity Committee Hosts Speaker from the U.S. Access Board

The ITL Diversity Committee recently presented a talk on accessibility for the ITL staff. William R. Botten, Accessibility Specialist, Office of Technical and Information Services, U.S. Access Board, gave an inspiring presentation on the progress made in making all places in America accessible to people with physical disabilities. His talk was entitled "Accessibility – 25 Years after the Passing of the Americans with Disabilities Act (ADA)." Botten described the work of the U.S. Access Board and noted that while much progress has been made since the passing of the legislation in 1990, much remains to be done to ensure that all Americans can access the nation's public buildings and open spaces.

Staff Accomplishments

Ronald Boisvert, Chief of ITL's Applied and Computational Mathematics Division, was selected to be a 2016 Fellow by the American Association for the Advancement of Science (AAAS). The award recognizes Boisvert's distinguished contributions to the fields of mathematical software and computational science, excellence in public administration of science, and service to the computing profession.

Ram D. Sriram, Chief of ITL's Software and Systems Division, has been named an Institute of Electrical and Electronics Engineers (IEEE) Fellow, effective January 1, 2017, for leadership in developing computational tools for healthcare enterprises. The IEEE grade of Fellow is conferred by the IEEE Board of Directors upon a person with an outstanding record of accomplishments in any of the IEEE fields of interest.

Elham Tabassi, an electrical engineer in the Information Access Division, was one of four winners for the 2016 Women in Biometrics Award, which was presented by SecureIDNews and the Security Industry Association. She was selected from more than 100 nominees and eight finalists. Finalists were selected based on contributions in one or more of the following areas to industry: leadership, participation, innovation, or mentoring.

Selected New Publications

National Checklist Program for IT Products: Guidelines for Checklist Users and Developers
By Stephen D. Quinn, Murugiah Souppaya, Melanie Cook, and Karen Scarfone
NIST Special Publication 800-70, Revision 3
November 2015 (includes updates as of 12/8/2016, see Appendix G)

A security configuration checklist is a document that contains instructions or procedures for configuring an information technology (IT) product to an operational environment, for verifying that the product has been configured properly, and/or for identifying unauthorized changes to the product. To facilitate development of checklists and to make checklists more organized and usable, NIST established the National Checklist Program (NCP). This publication explains how to use the NCP to find and retrieve checklists, and it also describes the policies, procedures, and general requirements for participation in the NCP.

Protecting Controlled Unclassified Information in Nonfederal Systems and Organizations
By Ron Ross, Patrick Viscuso, Gary Guissanie, Kelley Dempsey, and Mark Riddle
NIST Special Publication 800-171 Revision 1
December 2016

The protection of Controlled Unclassified Information (CUI) resident in nonfederal systems and organizations is of paramount importance to federal agencies. This publication provides federal agencies with a set of recommended security requirements for protecting the confidentiality of CUI when such information is resident in nonfederal systems and organizations; when the nonfederal organization is not collecting or maintaining information on behalf of a federal agency or using or operating a system on behalf of an agency.

*Guide to Securing Apple OS X 10.10 Systems for IT Professionals: A NIST Security Configuration Checklist*By Mark Badger, Murugiah Souppaya, Mark Trapnell, Eric Trapnell, Dylan Yaga, and Karen Scarfone
NIST Special Publication 800-179
December 2016

This publication assists IT professionals in securing Apple OS X 10.10 desktop and laptop systems within various environments. It provides detailed information about the security features of OS X 10.10 and security configuration guidelines. The publication recommends and explains tested, secure settings with the objective of simplifying the administrative burden of improving the security of OS X 10.10 systems in three types of environments: Standalone, Managed, and Specialized Security-Limited Functionality.

Small Business Information Security: The Fundamentals
By Patricia Toth and Celia Paulsen
NISTIR 7621 Revision 1
November 2016

It is vitally important that each small business understand and manage the risk to information, systems, and networks that support their business. This document presents the fundamentals of a small business information security program in nontechnical language.

Dramatically Reducing Software Vulnerabilities: Report to the White House Office of Science and Technology Policy
By Paul E. Black, Lee Badger, Barbara Guttman, and Elizabeth Fong
NISTIR 8151
December 2016

The goal of this report is to present a list of specific technical approaches that have the potential to make a dramatic difference in reducing software vulnerabilities by stopping them before they occur, by finding them before they are exploited, or by reducing their impact.

Usability Testing of a Contactless Fingerprint Device: Part 1
By Brian Stanton, Mary Theofanos, Susanne Furman, John M. Libert, Shahram Orandi, and John Grantham; NISTIR 8158; December 2016

Usability Testing of a Contactless Fingerprint Device: Part 2
By Brian Stanton, Mary Theofanos, Susanne Furman, and Patrick Grother; NISTIR 8159; December 2016

The use of biometrics to identify individuals has become an important component of efforts to ensure U.S. national security, and has also grown rapidly. Biometrics are, for example, an integral part of the United States Visitor and Immigrant Status Indicator Technology (US-VISIT) program. To address contagion and speed issues, the Department of Homeland Security Science and Technology program commissioned and funded a project to research technologies that could be used to acquire fingerprints without physical contact. Overall, the contactless scanner took longer to acquire the prints, acquired fewer prints under the no instruction and video instructional conditions, and was preferred less than the contact scanner.

Upcoming Technical Conferences

NSCI Seminar: New Directions for Energy-Efficient Computing Systems: From Sensing and Design to Runtime Management
Date: January 17, 2017
Place: NIST, Gaithersburg, Maryland
Sponsor: National Strategy Computing Initiative (NSCI) Committee
Cost: None

Power consumption is one of the major barriers towards improving the performance of computing systems. The exa-scale road map calls for exa-scale performance within a power budget of 20 - 40 MW, which requires much higher energy efficiency compared to those of existing computing systems. This talk reviews our laboratory's efforts to improve the energy efficiency of computing systems on three fronts that span measurements, design, and runtime management.

NIST contact: Barry Schneider, barry.schneider@nist.gov

NSCI Seminar: HPC in the Small: Current Results, Lessons Learned, and Future Work
Date: January 31, 2017
Place: NIST, Gaithersburg, Maryland
Sponsor: National Strategy Computing Initiative (NSCI) Committee
Cost: None

"HPC in the Small" has been successfully used to accelerate various computations by 2-4 orders of magnitude. In this talk, "HPC in the Small" will be defined, some of the results that have currently been achieved will be reviewed, and future directions of the work and how it fits within the context of NSCI will be discussed.

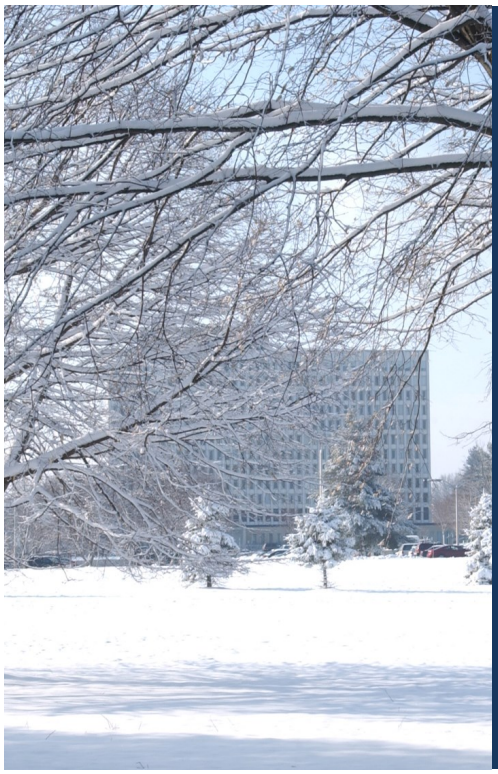
NIST contact: Barry Schneider, barry.schneider@nist.gov

30th Annual Federal Information Systems Security Educators' Association (FISSEA) Conference
Dates: March 14-15, 2017
Place: NIST, Gaithersburg, Maryland
Sponsors: NIST and FISSEA
Cost: TBD

The theme of this year's conference is Securing the Future to Infinity and Beyond: 30 Years of Improving Cybersecurity through Awareness, Training, and Education. The audience will consist of managers responsible for information systems security training programs in federal agencies, contractors providing awareness and training support, and faculty members of accredited educational institutions who are involved in information security training and education. FISSEA serves as a forum for the exchange of information about information security awareness, training, education, and certification.

NIST contact: Peggy Himes, peggy.himes@nist.gov

Disclaimer: Any mention of commercial products or reference to commercial organizations is for information only; it does not imply recommendation or endorsement by the National Institute of Standards and Technology nor does it imply that the products mentioned are necessarily the best available for the purpose.



The Information Technology Laboratory (ITL) is a major research component of the National Institute of Standards and Technology (NIST). As a world-class measurement and testing laboratory encompassing a wide range of areas of computer science, mathematics, statistics, and systems engineering, our research program supports NIST's mission to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. ITL cybersecurity experts collaborate to develop cybersecurity standards, guidelines, and associated methods and techniques for federal agencies and industry. Our mathematicians and statisticians collaborate with measurement scientists across NIST to help ensure that NIST maintains and delivers the world's leading measurement capability. ITL computer scientists and other research staff provide technical expertise and development that underpins national priorities such as cloud computing, the Smart Grid, homeland security, information technology for improved healthcare, and electronic voting. We invite you to learn more about how ITL is enabling the future of the nation's measurement and standards infrastructure for information technology by visiting our website at http://www.itl.nist.gov.

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