

NIST Special Publication 800-181
Revision 1

Workforce Framework for Cybersecurity (NICE Framework)

Rodney Petersen
Danielle Santos
Matthew C. Smith
Karen A. Wetzel
Greg Witte

This publication is available free of charge from:
<https://doi.org/10.6028/NIST.SP.800-181r1>

NIST Special Publication 800-181
Revision 1

Workforce Framework for Cybersecurity (NICE Framework)

Rodney Petersen (Director)
Danielle Santos (Manager of Communications and Operations)
Karen A. Wetzel (Manager of the NICE Framework)
National Initiative for Cybersecurity Education (NICE)
Applied Cybersecurity Division
Information Technology Laboratory

Matthew C. Smith
Greg Witte
Huntington Ingalls Industries
Annapolis Junction, MD

This publication is available free of charge from:
<https://doi.org/10.6028/NIST.SP.800-181r1>

November 2020



U.S. Department of Commerce
Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology
Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology

Authority

This publication has been developed by NIST in accordance with its statutory responsibilities under the Federal Information Security Modernization Act (FISMA) of 2014, 44 U.S.C. § 3551 *et seq.*, Public Law (P.L.) 113-283. NIST is responsible for developing information security standards and guidelines, including minimum requirements for federal information systems, but such standards and guidelines shall not apply to national security systems without the express approval of appropriate federal officials exercising policy authority over such systems. This guideline is consistent with the requirements of the Office of Management and Budget (OMB) Circular A-130.

Nothing in this publication should be taken to contradict the standards and guidelines made mandatory and binding on federal agencies by the Secretary of Commerce under statutory authority. Nor should these guidelines be interpreted as altering or superseding the existing authorities of the Secretary of Commerce, Director of the OMB, or any other federal official. This publication may be used by nongovernmental organizations on a voluntary basis and is not subject to copyright in the United States. Attribution would, however, be appreciated by NIST.

National Institute of Standards and Technology Special Publication 800-181
Nat'l. Inst. Stand. Technol. Spec. Publ. 800-181 Rev. 1, 27 pages (November 2020)
CODEN: NSPUE2

This publication is available free of charge from:
<https://doi.org/10.6028/NIST.SP.800-181r1>

Certain commercial entities, equipment, or materials may be identified in this document in order to describe an experimental procedure or concept adequately. Such identification is not intended to imply recommendation or endorsement by NIST, nor is it intended to imply that the entities, materials, or equipment are necessarily the best available for the purpose.

There may be references in this publication to other publications currently under development by NIST in accordance with its assigned statutory responsibilities. The information in this publication, including concepts and methodologies, may be used by federal agencies even before the completion of such companion publications. Thus, until each publication is completed, current requirements, guidelines, and procedures, where they exist, remain operative. For planning and transition purposes, federal agencies may wish to closely follow the development of these new publications by NIST.

Organizations are encouraged to review all draft publications during public comment periods and provide feedback to NIST. Many NIST cybersecurity publications, other than the ones noted above, are available at <https://csrc.nist.gov/publications>.

Comments on this publication may be submitted to:

National Institute of Standards and Technology
Attn: Applied Cybersecurity Division, Information Technology Laboratory
100 Bureau Drive (Mail Stop 2000) Gaithersburg, MD 20899-2000
Email: NICEFramework@nist.gov

All comments are subject to release under the Freedom of Information Act (FOIA).

Reports on Computer Systems Technology

The Information Technology Laboratory (ITL) at the National Institute of Standards and Technology (NIST) promotes the U.S. economy and public welfare by providing technical leadership for the Nation's measurement and standards infrastructure. ITL develops tests, test methods, reference data, proof of concept implementations, and technical analyses to advance the development and productive use of information technology. ITL's responsibilities include the development of management, administrative, technical, and physical standards and guidelines for the cost-effective security and privacy of other than national security-related information in federal information systems. The Special Publication 800-series reports on ITL's research, guidelines, and outreach efforts in information system security, and its collaborative activities with industry, government, and academic organizations.

Abstract

This publication from the National Initiative for Cybersecurity Education (NICE) describes the Workforce Framework for Cybersecurity (NICE Framework), a fundamental reference for describing and sharing information about cybersecurity work. It expresses that work as Task statements and describes Knowledge and Skill statements that provide a foundation for learners including students, job seekers, and employees. The use of these statements helps students to develop skills, job seekers to demonstrate competencies, and employees to accomplish tasks. As a common, consistent lexicon that categorizes and describes cybersecurity work, the NICE Framework improves communication about how to identify, recruit, develop, and retain cybersecurity talent. The NICE Framework is a reference source from which organizations or sectors can develop additional publications or tools that meet their needs to define or provide guidance on different aspects of cybersecurity education, training, and workforce development.

Keywords

Competency; cybersecurity; cyberspace; education; knowledge; role; security; skill; task; team; training; workforce; work role.

Patent Disclosure Notice

NOTICE: The Information Technology Laboratory (ITL) has requested that holders of patent claims whose use may be required for compliance with the guidance or requirements of this publication disclose such patent claims to ITL. However, holders of patents are not obligated to respond to ITL calls for patents and ITL has not undertaken a patent search in order to identify which, if any, patents may apply to this publication.

As of the date of publication and following call(s) for the identification of patent claims whose use may be required for compliance with the guidance or requirements of this publication, no such patent claims have been identified to ITL.

No representation is made or implied by ITL that licenses are not required to avoid patent infringement in the use of this publication.

Document Conventions

The terms “shall” and “shall not” indicate requirements to be followed strictly in order to conform to the publication and from which no deviation is permitted. The terms “should” and “should not” indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required, or that (in the negative form) a certain possibility or course of action is discouraged but not prohibited. The terms “may” and “need not” indicate a course of action permissible within the limits of the publication. The terms “can” and “cannot” indicate a possibility and capability, whether material, physical or causal.

Throughout the NICE Framework, those performing cybersecurity work—including students, job seekers, and employees—are referenced as Learners. This moniker highlights that each member of the workforce is also a lifelong learner.