National Institute of Standards and Technology
U.S. Department of Commerce

Cyber - Supply Chain Risk Management in NIST Publications

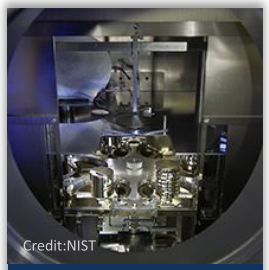
Celia Paulsen

11/13/2019

INFORMATION TECHNOLOGY LABORATORY

NIST Labs and Extramural Programs

Material Measurement Laboratory

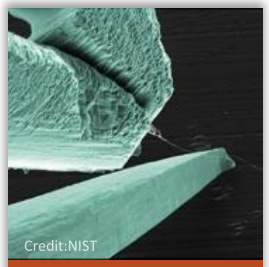


Physical Measurement Laboratory

Engineering Laboratory

Information Technology Laboratory

Communication Technology Laboratory



Center for Nanoscale Science and Technology

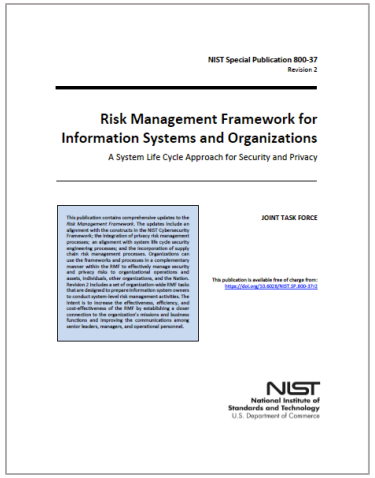
NIST Center for Neutron Research

Hollings Manufacturing Extension Partnership

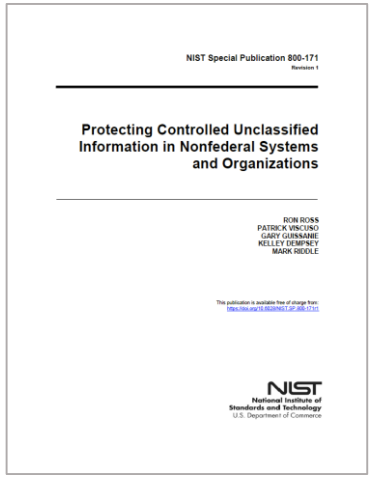
Manufacturing USA

Baldridge Performance Excellence Program

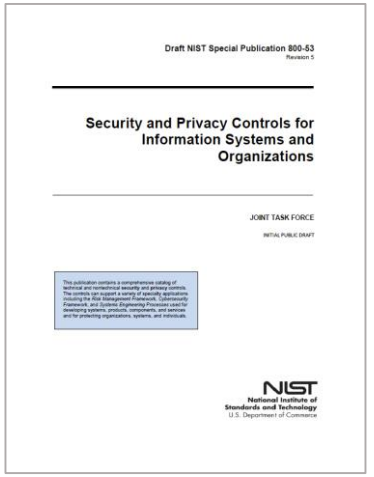
Agenda



NIST SP 800-37 Rev. 2



NIST SP 800-171 series

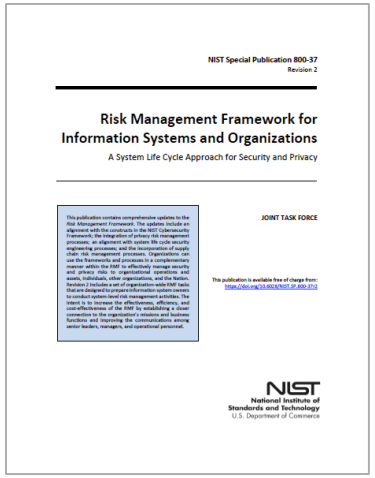


DRAFT NIST SP 800-53 Rev. 5

NIST SP 800-161

Framework for Improving Critical Infrastructure Cybersecurity

Agenda



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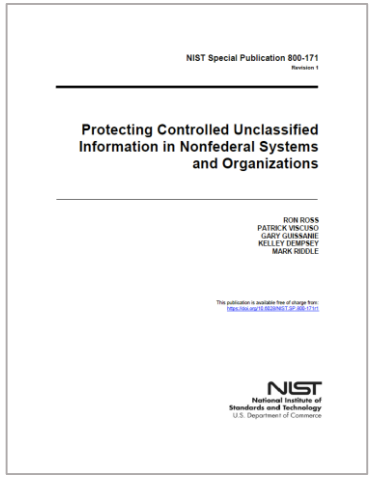

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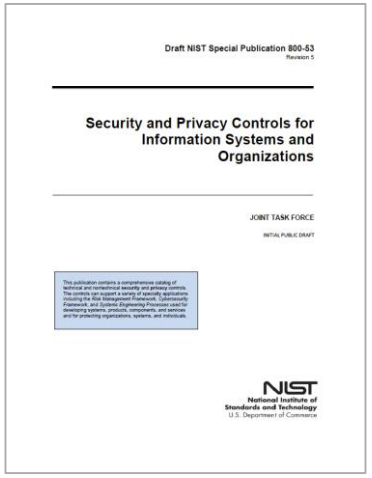

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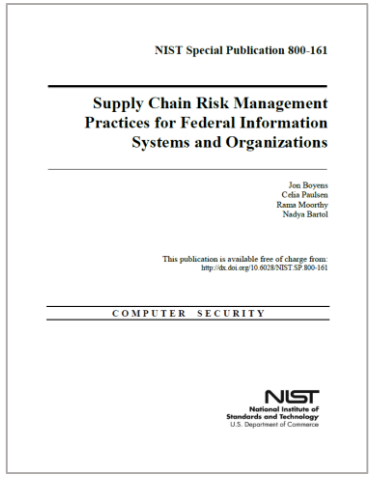


NIST SP 800-161

Framework for Improving Critical Infrastructure Cybersecurity

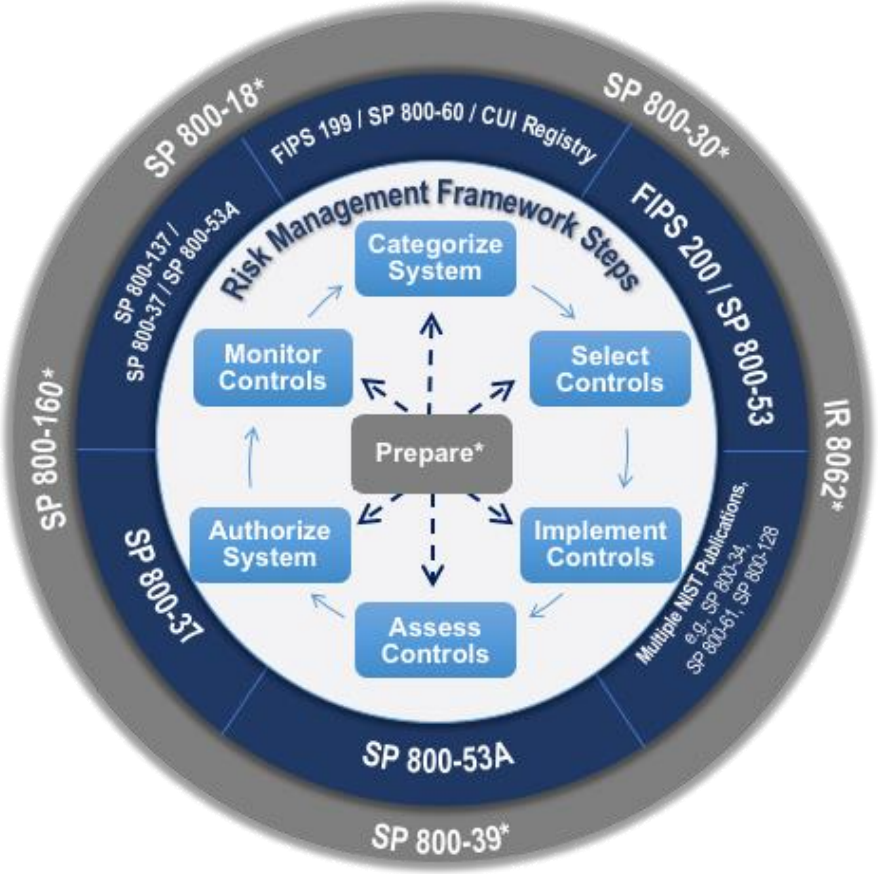
NIST Special Publication 800-37 Rev. 2

Risk Management Framework for Information Systems and Organizations

Update:

- Integrates privacy, **supply chain**, and security engineering into the Risk Management Framework (RMF)
- Aligns the Cybersecurity Framework to the RMF
- Demonstrates how the RMF is implemented in the system development life cycle

- **New Step: Prepare**
- All RMF Tasks include potential inputs and expected outputs
- **'New' Tasks** in existing Steps



RMF & C-SCRM

- Guidance is in alignment with FISMA and OMB A-130 requirements

- Every step in the RMF can **(not necessarily should)** be executed by nonfederal external providers **except** for the ***Authorize*** step

Chapter 2.8:

- Introduction to supply chain risk
- Directs organizations to **develop a SCRM policy** similar to a Risk Management Strategy (Task P-2):
  - Supports other organizational policies (e.g. acquisition, information security)
  - Addresses **goals and objectives**
  - Defines **integration points** for SCRM with other organizational activities
  - Defines **roles and responsibilities**
- Describes (briefly) how organizations obtain assurance from providers

RMF & C-SCRM (Tasks)

C-SCRM additions to Tasks:

- **Throughout:** “including supply chain risks”
- **Task P-3**: **Integrate supply chain risk assessment results** into the organization-wide risk assessment
- **Task P-7**: Include supply chain risk considerations in organizational continuous monitoring strategies
- **Task P-9**: **Identify stakeholders** (including through all aspects of the supply chain)
- **Task P-11**: For systems partially or wholly managed, make sure the **authorization boundary is clearly defined in agreements**.

RMF & C-SCRM (Tasks)

- **Task P-14**: Conduct a **system-level supply chain risk assessment**
  - Risk that the **use of an external provider** could result in loss
  - Risk related to the **disposition of a system/elements**
  - **Collaborate with supply chain partners** on assessments/mitigations
- **Task P-15**: Consider supply chain when making **security requirements**
- **Task C-1**: Include supply chain information (i.e. provenance) in **system description**
- **Task A-2**: If a third party is involved in implementing controls, the organization can **request the assessment plan / results / evidence** (may require contract or NDA)
- **Task A-3**: Assessments can be conducted on commercial products

For More on NIST SP 800-37 Rev. 2:

- Publication: https://csrc.nist.gov/publications/detail/sp/800-37/rev-2/final
- Video and presentations from “RMF 2.0” webcast: go.usa.gov/xENcs
- NIST Risk Management Program:
  https://csrc.nist.gov/Projects/Risk-Management
- Federal Computer Security Program Managers (FCSM) Forum:
  https://csrc.nist.gov/Projects/Forum
- NIST RMF Team: sec-cert@nist.gov

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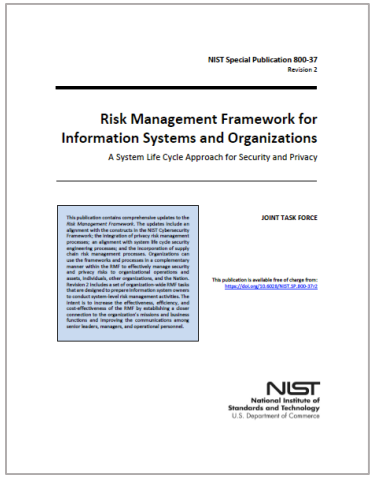

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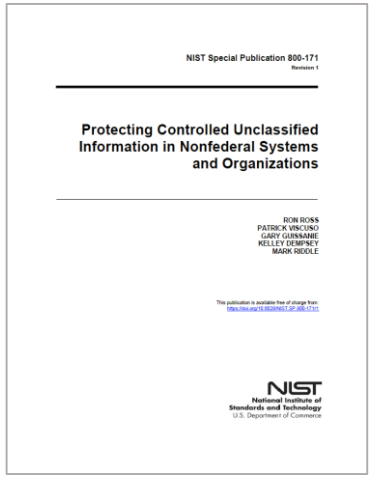
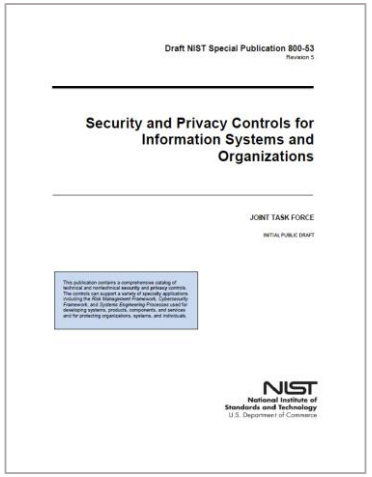


NIST SP 800-171 series



DRAFT NIST SP 800-53 Rev. 5

NIST SP 800-161

Framework for Improving Critical Infrastructure Cybersecurity

NIST Special Publication 800-171 series

Protecting Controlled Unclassified Information in Nonfederal Systems and Organizations

Executive Order 13556: established government-wide CUI program

CUI Registry:

- information, guidance, policy, and requirements on handling CUI
- identifies approved CUI categories and sub-categories
- Sets out procedures for the use of CUI (marking, safeguarding, transporting, etc.)

NIST SP 800-171 Rev. 1: Provide **federal agencies** a set of recommended security requirements for protecting the **confidentiality** of Controlled Unclassified Information (CUI) in **nonfederal systems and organizations**

NIST SP 800-171A: Provides **federal and nonfederal organizations** with a methodology that can be employed to **conduct assessments** of the CUI security requirements in NIST SP 800-171.

NIST SP 800-171B (DRAFT): Provides enhanced security requirements where information runs a **higher than usual risk of exposure**, **when mandated in a contract, grant, or other agreement**.

Assumptions re: Nonfederal Organizations

- Have information technology infrastructures in place.
  - Are not developing or acquiring systems specifically for the purpose of processing, storing, or transmitting CUI.
- Have safeguarding measures in place to protect their information.
  - May also be sufficient to satisfy the CUI requirements.
- May not have the necessary organizational structure or resources to satisfy every CUI security requirement.
  - Can implement alternative, but equally effective, security measures.
- Can implement a variety of potential security solutions.
  - Directly or through the use of managed services.

For more on the NIST SP 800-171 series

Publications:

- 800-171r1: https://csrc.nist.gov/publications/detail/sp/800-171/rev-1/final
- 800-171A: https://csrc.nist.gov/publications/detail/sp/800-171a/final
- 800-171B: https://csrc.nist.gov/publications/detail/sp/800-171b/draft

Other:

- Video and presentations from October 2018 workshop: https://www.nist.gov/news-events/events/2018/10/controlled-unclassified-information-security-requirements-workshop

- NIST CUI website with FAQ: https://csrc.nist.gov/Projects/protecting-controlled-unclassified-information

- NIST RMF Team: sec-cert@nist.gov

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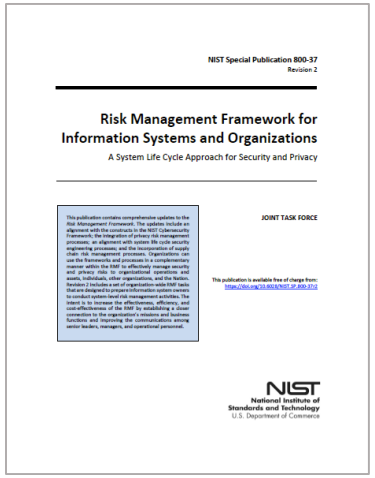

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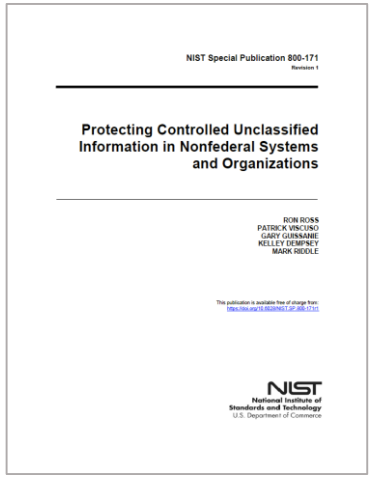

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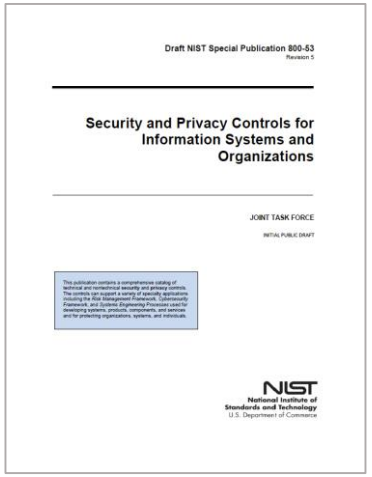

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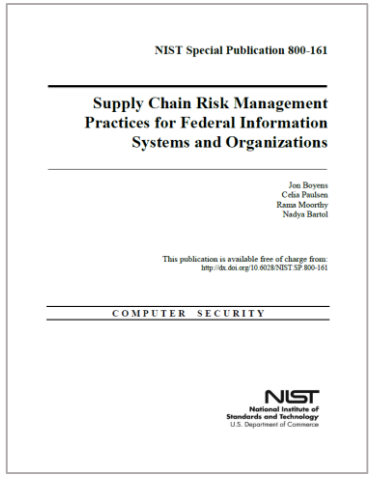

NIST SP 800-161

Framework for Improving Critical Infrastructure Cybersecurity

DRAFT NIST Special Publication 800-53 Rev. 5

Security and Privacy Controls for Information Systems and Organizations

Security (and now Privacy) control catalog

Update *(NOT ALL ARE IN THE PUBLISHED DRAFT):*

- Reduced federal focus
- Align with other publications (SP 800-161, SP 800-160, CSF)
- Decoupled “information” from “system”
- Separate control selection process from the controls themselves
  - Information will be moved to other NIST publications (e.g. SP 800-37)
- Removed tailoring guidance to appendix
- Incorporate new state-of-the-practice controls
- Established ***new supply chain risk management family***

- Future update may involve transitioning controls to an online portal

DRAFT SP 800-53 Rev. 5 & SCRM

New supply chain risk management family (SR family)

- Moved SA-12 into the new family
- **SCRM Policy**
- **System-level SCRM Plan** concept from NIST SP 800-161
- **Provenance** concept from NIST SP 800-161

PM-31 Supply Chain Risk Management Strategy

- Is the **organization-level SCRM plan** from SP 800-161

RA-3(1) Supply Chain Risk Assessment

IR-family: reporting of supply chain incident information and coordinating with supply chain partners

Throughout: AT-3 role-based training; CM-4 impact analysis, MA-2 controlled maintenance; SC-29 Heterogeneity, etc.

SUBJECT TO CHANGE

For more on the NIST SP 800-53

Publications:

- 800-53 Rev. 4: https://csrc.nist.gov/publications/detail/sp/800-53/rev-4/final
- Published Draft 800-53 Rev. 5 (as of Aug. 2007): https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/draft

- Website: https://csrc.nist.gov/Projects/risk-management

- NIST FISMA Team: sec-cert@nist.gov

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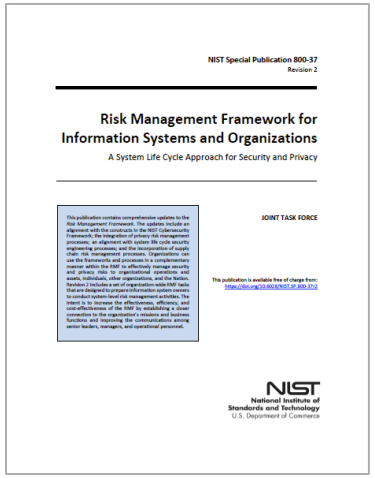

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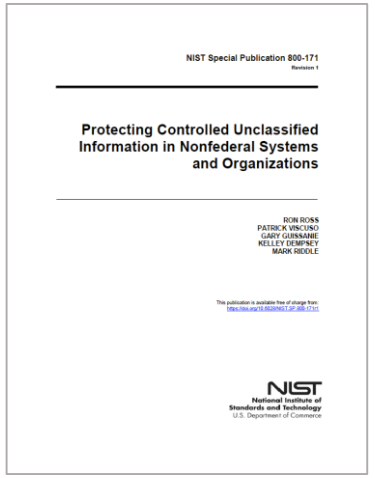

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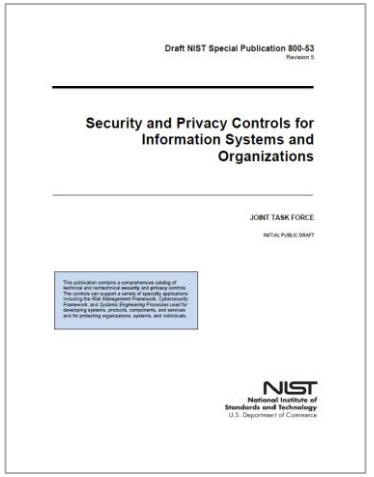


DRAFT NIST SP 800-53 Rev. 5

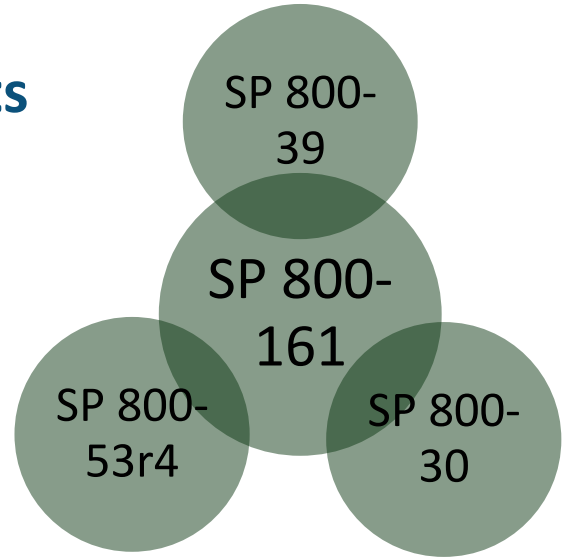
NIST SP 800-161

Framework for Improving Critical Infrastructure Cybersecurity

The C-SCRM flagship document

Used familiar publications to demonstrate how **federal departments and agencies** could integrate C-SCRM into their **existing processes**.

- **Tiered** risk management from NIST SP 800-39
- **Risk Assessment** methodology from NIST SP 800-30 (Frame, Assess, Respond, Monitor)
- **Security controls** from NIST SP 800-53 Rev. 4



- 6 new controls and/or control enhancements (not in NIST SP 800-53 Rev 4)
- New control family – “Provenance”

C-SCRM Practices

Update beginning this FY:

- Align with NIST SP 800-53 Rev. 5 (and other documents)
- Provide additional implementation guidance
- Add additional controls

- Provides a resource for people **focused** on SCRM
- Directed towards **federal departments and agencies**, but the information may be usable by any organization

Trust	**But Verify**
• Organization →	• Due Diligence
• Process →	• Audits
• Products/Service →	• Testing

For more on the NIST SP 800-161

- Publication: https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-161.pdf
- Software and Supply Chain Assurance Forum: https://csrc.nist.gov/scrm/ssca
- NIST SCRM Webpage: https://csrc.nist.gov/scrm
- NIST SCRM Team: scrm@nist.gov

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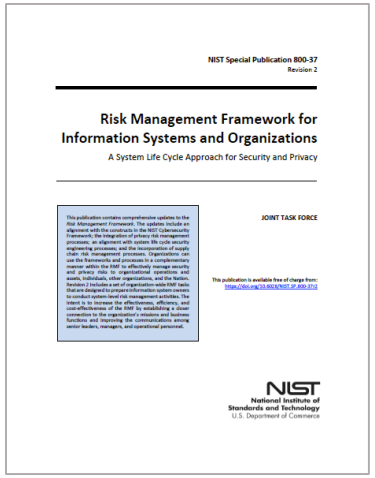

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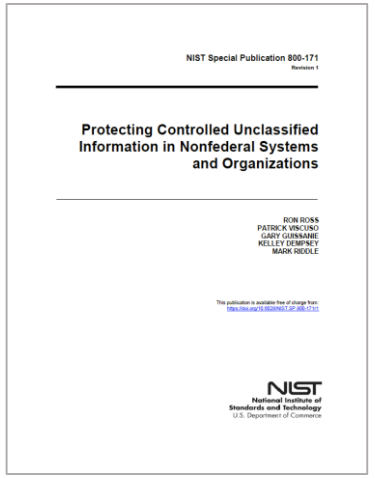

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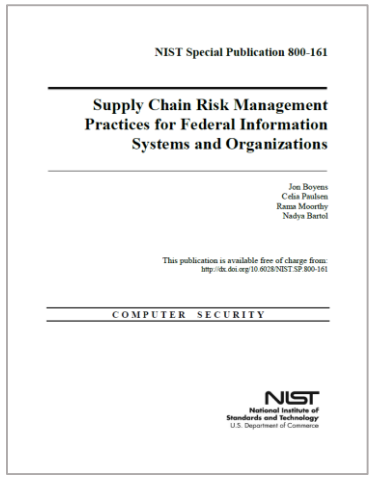

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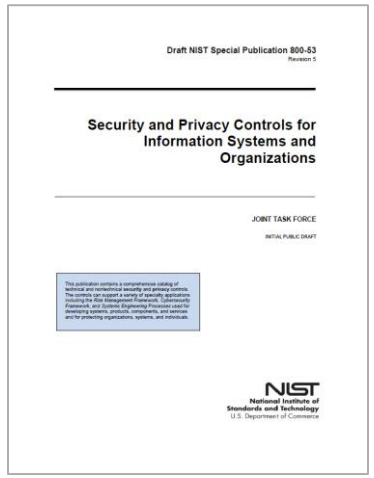

DRAFT NIST SP 800-53 Rev. 5

Framework for Improving Critical Infrastructure Cybersecurity

Framework for Improving Critical Infrastructure Cybersecurity (CSF v1.1)

Voluntary framework:

- Core: cybersecurity activities and outcomes
- Implementation Tiers: context on how an organization views cybersecurity
- **Profiles**: an organization's unique alignment against the Framework Core

Version 1.1:

- Section 3.3: expanded to discuss SCRM
- Section 3.4 (new): buying decisions
- SCRM criteria added to implementation tiers
- Added a Supply Chain Management Category (ID.SC)
- Also has other subcategories that are SCRM-related

--Communication Tool--

CSF & C-SCRM

Function	Category	Subcategory
Identify (ID)	**Business Environment (ID.BE): …**	**ID.BE-1**: The organization's **role in the supply chain** is identified and communicated
	Supply Chain Risk Management (ID.SC): The organization's priorities, constraints, risk tolerances, and assumptions are established and used to support risk decisions associated with managing supply chain risk. The organization has established and implemented the processes to identify, assess and manage supply chain risks.	**ID.SC-1: Cyber supply chain risk management processes are identified, established, assessed, managed, and agreed to by organizational stakeholders**
		ID.SC-2: Suppliers and third party partners of information systems, components, and services are **identified, prioritized, and assessed** using a cyber supply chain risk assessment process
		ID.SC-3: Contracts with suppliers and third-party partners are **used to implement appropriate measures** designed to meet the objectives of an organization's cybersecurity program and Cyber Supply Chain Risk Management Plan.
		ID.SC-4: Suppliers and third-party **partners are routinely assessed** using audits, test results, or other forms of evaluations to confirm they are meeting their contractual obligations.
		ID.SC-5: Response and recovery planning and testing are conducted **with suppliers and third-party providers**
Protect (PR)	**Awareness and Training (PR.AT):** …	**PR.AT-3**: Third-party stakeholders (e.g., suppliers, customers, partners) understand their **roles and responsibilities**

For more on the CSF

- Website: https://www.nist.gov/cyberframework
- CSF Roadmap 1.1: https://www.nist.gov/cyberframework/related-efforts-roadmap
- CSF Team: cyberframework@nist.gov

Questions?

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