Overview of NIST Cybersecurity Standards & Guidance for Federal Agencies

Victoria Yan Pillitteri
victoria.yan@nist.gov
Computer Security Division

AGENDA

Overview of NIST Cybersecurity Standards and Guidance for Federal Agencies

- About the National Institute of Standards and Technology (NIST)
- NIST Cybersecurity Standards and Guidance for Federal Agencies
- Contact Information and Questions

NIST 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.

Federal Information Security Modernization Act (FISMA) Implementation Project

Established: 2003 **Intended Audience:** Federal agencies*

Purpose: Produce key **security and risk management standards** and guidelines **required by Congressional legislation** (FISMA 2014).

- Standards for:
  - Categorizing information and systems by mission impact
  - Minimum security requirements for information and systems
- Guidance for:
  - Selecting appropriate security controls for systems
  - Assessing security controls in systems and determining security control effectiveness
  - Security authorization of systems
  - Monitoring the security controls and the security authorizations of systems

*FISMA is applicable to federal organizations, systems and information

Information Security Risk Management Publications

Federal Information Processing Standards (FIPS)

- **FIPS 199 – Standards for Security Categorization**
- FIPS 200 – Minimum Security Requirements

Special Publications (SPs)

- SP 800-18 – Guide for System Security Plan Development
- SP 800-30 – Guide for Conducting Risk Assessments
- SP 800-34 – Guide for Contingency Plan development
- **SP 800-37 – Guide for Applying the RMF**
- **SP 800-39 – Managing Information Security Risk**
- **SP 800-53**/53A/B **– Controls Catalog**, Assessment Procedures, & Control Baselines
- SP 800-60 – Mapping Information Types to Security Categories
- SP 800-128 – Security-focused Configuration Management
- SP 800-137 – Information Security Continuous Monitoring
- SP 800-160 – Systems Security Engineering
- SP 800-161 – Supply Chain Risk Management Practices
- SP 800-171/A/B – Protecting Controlled Unclassified Information in Nonfederal Systems and Organizations, Assessment Procedures, & Enhanced Security Requirements

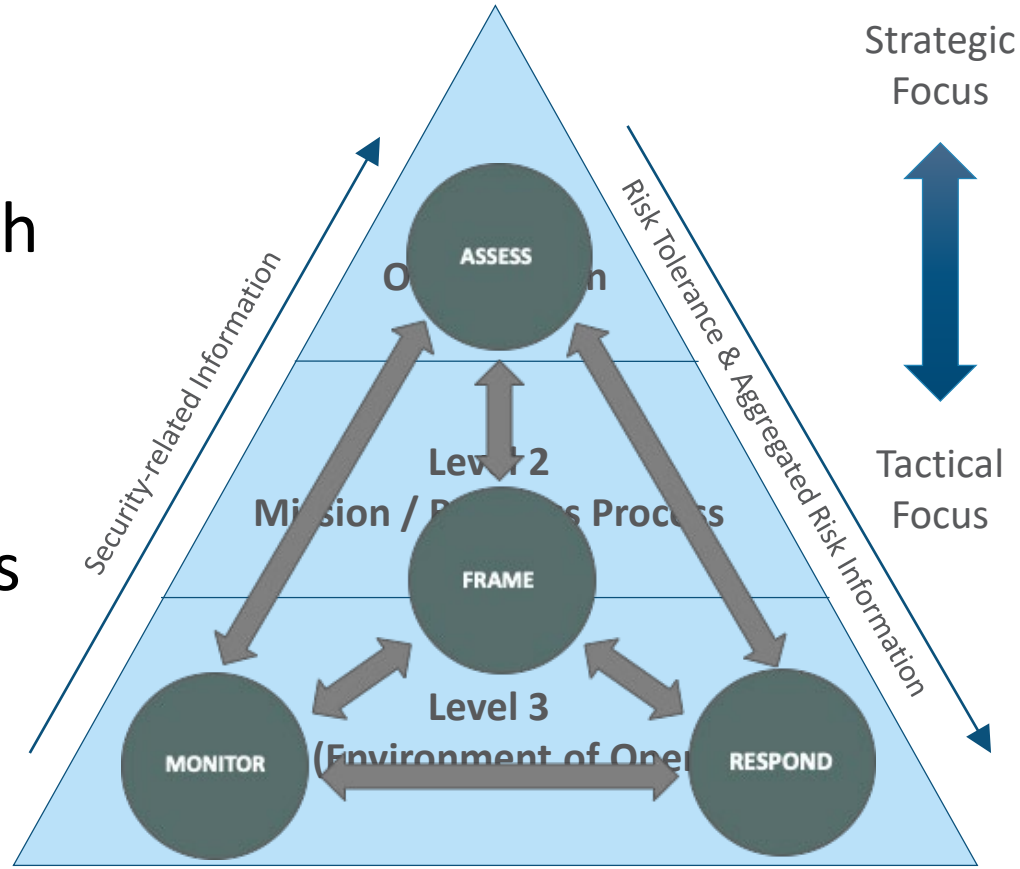
Interagency Reports (IRs)

- NISTIR 8011 – Automation Support for Security Control Assessments
- NISTIR 8062 – An Introduction to Privacy Engineering and Risk Management in Federal Systems

NIST Special Publication 800-39

Managing Information Security Risk – Organization, Mission, and Information System View

- Multi-tiered risk management approach
- Implemented by the Risk Executive Function
- Enterprise Architecture and SDLC Focus
- Supports all steps in the RMF

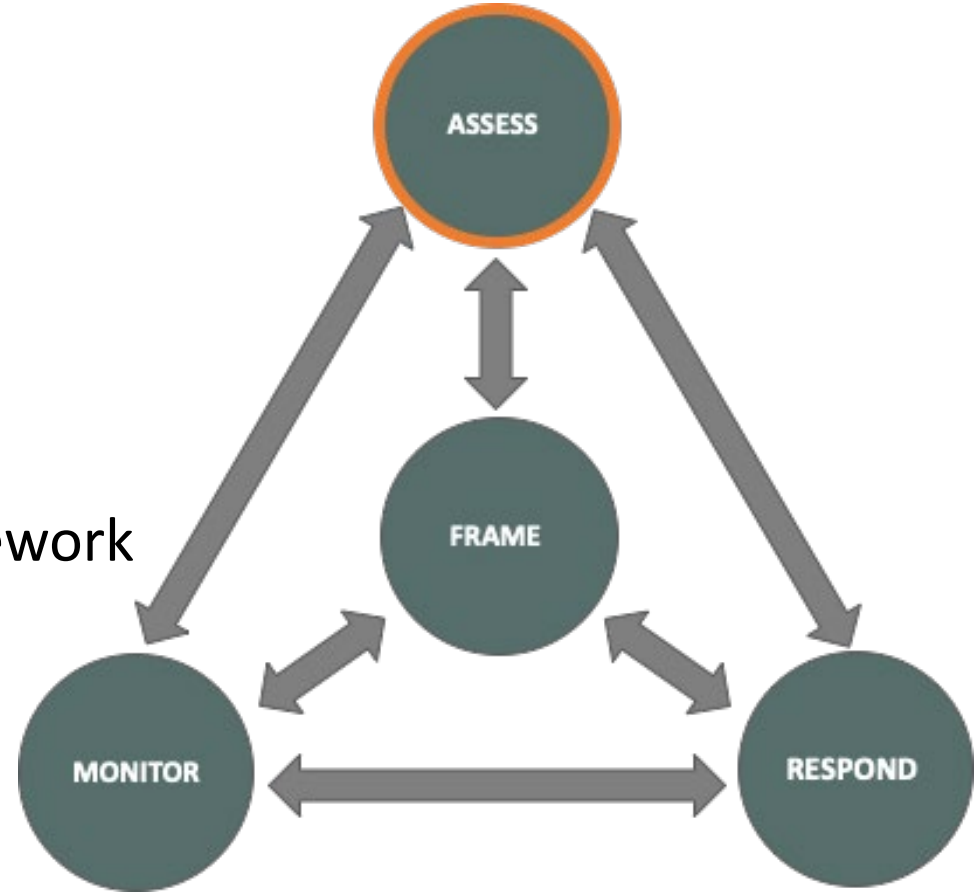


Three Levels of Organization-Wide Risk Management

NIST Special Publication 800-30

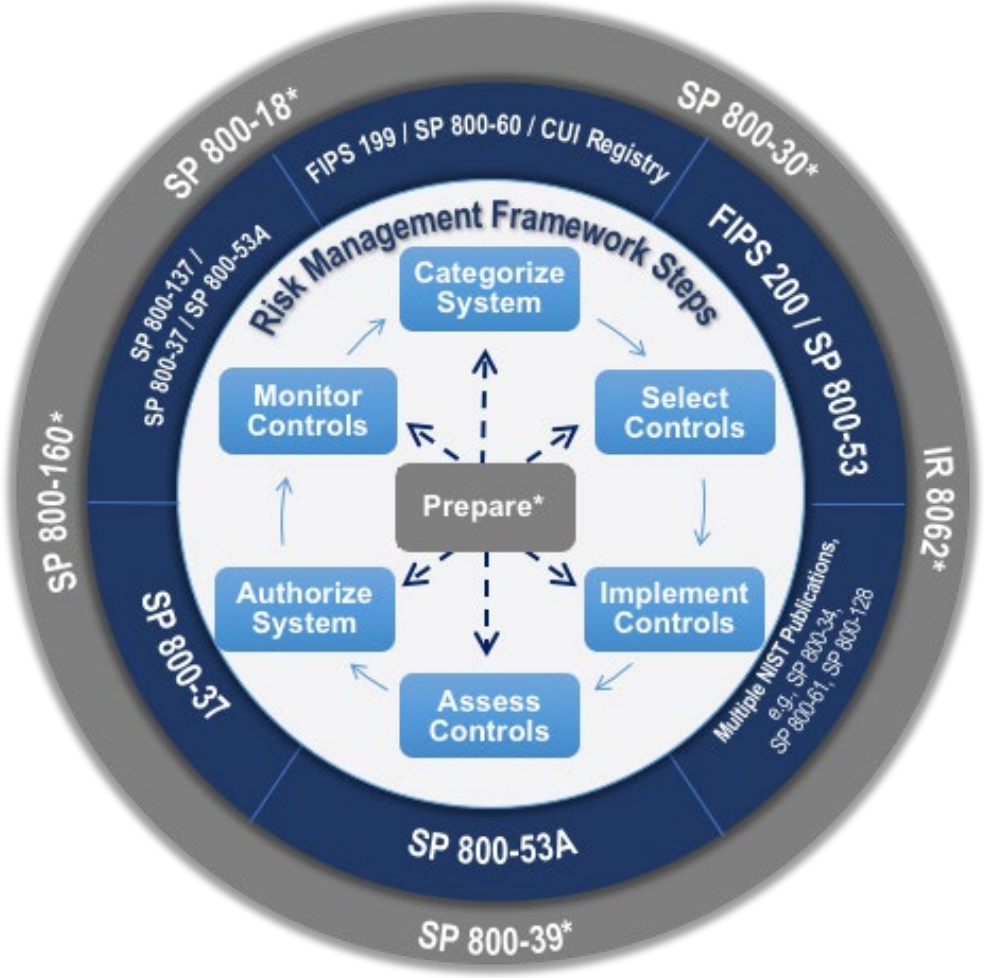
Guide for Conducting Risk Assessments

- Addresses the Assessing Risk component of Risk Management (from SP 800-39)
- Provides guidance on applying risk assessment concepts to:
  - All three tiers in the risk management hierarchy
  - Each step in the Risk Management Framework
- Supports all steps of the Risk Management Framework
- A 3-step Process:
  - Step 1: Prepare for assessment
  - Step 2: Conduct the assessment
  - Step 3: Maintain the assessment



NIST Special Publication 800-37, Rev. 2

Risk Management Framework for Information Systems and Organizations: A System Life Cycle Approach for Security and Privacy



- A holistic and **comprehensive risk management** process
  - Can be used to communicate across an organization (C-Suite to the systems/operations)
  - Aligns the **Cybersecurity Framework** to the RMF
  - Includes **privacy, supply chain** and **security engineering**
- Integrates the Risk Management Framework (RMF) into the **system development lifecycle**
- Provides processes (tasks) for each of the steps (Prepare, Categorize, Select, Implement, Assess, Authorize, and Monitor)

NIST Special Publication 800-53, Rev. 4

Security and Privacy Controls for Information Systems and Organizations

- **Catalog** of **security and privacy** controls
  - Not focused on any specific technologies or implementations
  - Can be applied to any kind of system
- Defines **three security baselines** (Low, Moderate, High)
  - Baseline for use determined by:
    - information and system categorization (impact)
    - organizational risk assessment and risk tolerance
    - system-level risk assessment
- Some controls from the catalog are not included in any baseline

NIST SP 800-53, Rev. 5 Final Draft is currently in review – there are changes for improved usability, address emerging threats, emphasize privacy and supply chain risk management, and systems security engineering.

NIST Special Publication 800-53, Rev. 4

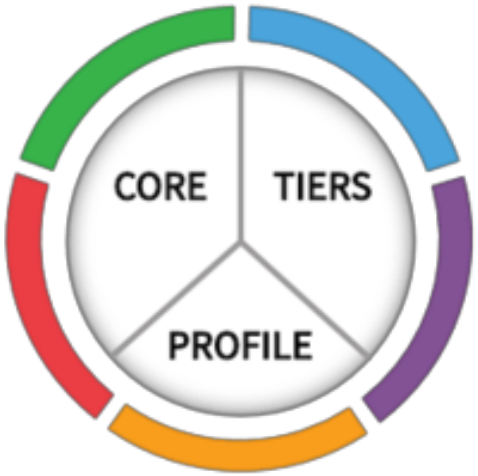
Security and Privacy Controls for Information Systems and Organizations

SP 800-53, Rev. 4 Control Families

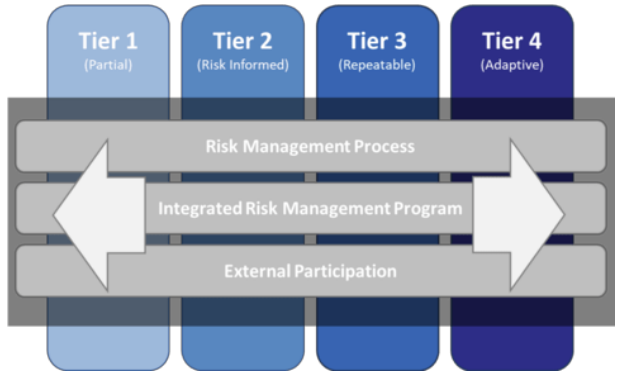
AC – Access Control	PL – Planning
AT – Awareness and Training	PM – Program Management
AU – Audit and Accountability	PS – Personnel Security
CA – Security Assessment and Authorization	RA – Risk Assessment
CM – Configuration Management	SA – System and Service Acquisition
CP – Contingency Planning	SC – System and Communication Protection
IA – Identification and Authentication	SI – System and Information Integrity
IR – Incident Response	AP* – Authority and Purpose
MA - Maintenance	AR* – Accountability, Audit, and Risk Management
MP – Media Protection	DI* – Data Quality and Integrity
PE – Physical and Environmental Protection	DM* – Data Minimization and Retention

NIST Cybersecurity Framework (CSF)

The CSF is **voluntary** guidance, **based on existing standards, guidelines, and practices** for organizations to better manage and reduce cybersecurity risk.



Function	Category	ID
Identify	Asset Management	ID.AM
	Business Environment	ID.BE
	Governance	ID.GV
	Risk Assessment	ID.RA
	Risk Management Strategy	ID.RM
	Supply Chain Risk Management	ID.SC
Protect	Identity Management and Access Control	PR.AC
	Awareness and Training	PR.AT
	Data Security	PR.DS
	Information Protection Processes & Procedures	PR.IP
	Maintenance	PR.MA
	Protective Technology	PR.PT
Detect	Anomalies and Events	DE.AE
	Security Continuous Monitoring	DE.CM
	Detection Processes	DE.DP
Respond	Response Planning	RS.RP
	Communications	RS.CO
	Analysis	RS.AN
	Mitigation	RS.MI
	Improvements	RS.IM
Recover	Recovery Planning	RC.RP
	Improvements	RC.IM
	Communications	RC.CO



https://www.nist.gov/cyberframework
cyberframework@nist.gov

STAY IN TOUCH

PUBLICATIONS  https://csrc.nist.gov

PROJECT INFO  https://csrc.nist.gov/Projects/Risk-Management

CONTACT  sec-cert@nist.gov  @NISTcyber