NIST SPECIAL PUBLICATION 1800-29A

# Data Confidentiality:

## Detect, Respond to, and Recover from Data Breaches

**Volume A:**
**Executive Summary**

**William Fisher**
National Cybersecurity Center of Excellence
NIST

**R. Eugene Craft**
**Michael Ekstrom**
**Julian Sexton**
**John Sweetnam**
The MITRE Corporation
McLean, Virginia

February 2024

FINAL

This publication is available free of charge from:
https://doi.org/10.6028/NIST.SP.1800-29

# Executive Summary

## CHALLENGE

An organization must protect its information from unauthorized access and disclosure. Data breaches large and small can have far-reaching operational, financial, and reputational impacts on an organization. In the event of a data breach, data confidentiality can be compromised via unauthorized exfiltration, leaking, or spills of data to unauthorized parties, including the general public.

It is essential for an organization to identify and protect assets to prevent breaches. And in the event a data breach occurs, it is essential that an organization be able to detect the ongoing breach themselves, as well as begin to execute a response and recovery plan that leverages security technology and controls.

## BENEFITS

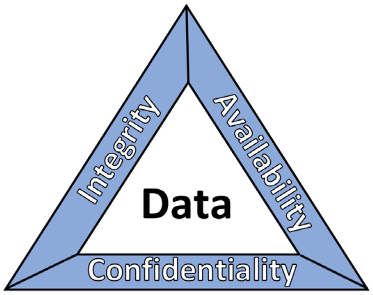
The National Cybersecurity Center of Excellence (NCCoE) at the National Institute of Standards and Technology (NIST) developed this guide to help organizations implement strategies in response to data confidentiality attacks. This NIST Cybersecurity Practice Guide demonstrates how organizations can develop and implement appropriate actions to detect, respond and recover from a data confidentiality cybersecurity event. It includes numerous technology and security recommendations to improve your organization's cybersecurity posture.

**This practice guide can help your organization:**

- Detect losses of data confidentiality in your organization.
- Respond to data breach events using your organization's security architecture.
- Recover from a data breach in a manner that lessens monetary and reputational damage.

## APPROACH

This publication is part of a series of projects that seek to provide guidance to improve an organization's data security in the context of the CIA triad. The CIA triad represents the three pillars of information security: confidentiality, integrity, and availability. This practice guide focuses on data confidentiality: the property that data has not been disclosed in an unauthorized fashion. Data confidentiality concerns data in storage, during processing, and while in transit. (Note: These definitions are from NIST Special Publication (SP) 800-12 Rev 1, An Introduction to Information Security.)



RECOVER
IDENTIFY
FRAMEWORK
RESPOND
PROTECT
DETECT

This guide applies data confidentiality principles through the lens of the NIST Cybersecurity Framework version 1.1. Specifically this practice guide focuses on the latter three of those functions, informing organizations on how to **detect**, **respond** to, and **recover** from a data confidentiality attack, and manage data confidentiality risks. A complementary project and accompanying practice guide (SP1800-28) addresses data confidentiality through the lens of the principles of **identify** and **protect**.

The NCCoE developed and implemented an example solution that incorporates multiple systems working in concert to detect, respond to, and recover from data confidentiality cybersecurity events. The solution will demonstrate the ability to detect an ongoing data breach, as well as recommending technical and policy remediations against the same. This document highlights both the security and privacy characteristics of the example solution by considering common data security use cases an organization might seek to address and by enumerating problematic data actions that might impact privacy.

| Collaborator | Security Capability or Component |
|---|---|
| Dispel | Network Protection |
| Cisco | Event Detection, User Access Control |
| FireEye | Logging |
| PKWARE | Data Protection |

While the NCCoE used a suite of commercial products to address this challenge, this guide does not endorse these particular products, nor does it guarantee compliance with any regulatory initiatives. Your organization's information security experts should identify the products that will best integrate with your existing tools and IT system infrastructure. Your organization can adopt this solution or one that adheres to these guidelines in whole, or you can use this guide as a starting point for tailoring and implementing parts of a solution.

## HOW TO USE THIS GUIDE

Depending on your role in your organization, you might use this guide in different ways:

**Business decision makers, including chief information security and technology officers** can use this part of the guide, *NIST SP 1800-29A: Executive Summary*, to understand the drivers for the guide, the cybersecurity challenge we address, our approach to solving this challenge, and how the solution could benefit your organization.

**Technology, security, and privacy program managers** who are concerned with how to identify, understand, assess, and mitigate risk can use *NIST SP 1800-29B: Approach, Architecture, and Security*

*Characteristics,* which describes what we built and why, including the risk analysis performed and the security/privacy control mappings.

**IT professionals** who want to implement an approach like this can make use of *NIST SP 1800-29C: How-To Guides*, which provide specific product installation, configuration, and integration instructions for building the example implementation, allowing you to replicate all or parts of this project.

## SHARE YOUR FEEDBACK

You can view or download the guide at https://www.nccoe.nist.gov/projects/building-blocks/data-security/dc-detect-identify-protect. Help the NCCoE make this guide better by sharing your thoughts with us as you read the guide. If you adopt this solution for your own organization, please share your experience and advice with us. We recognize that technical solutions alone will not fully enable the benefits of our solution, so we encourage organizations to share lessons learned and best practices for transforming the processes associated with implementing this guide.

To provide comments or to learn more by arranging a demonstration of this example implementation, contact the NCCoE at ds-nccoe@nist.gov.

## COLLABORATORS

Collaborators participating in this project submitted their capabilities in response to an open call in the Federal Register for all sources of relevant security capabilities from academia and industry (vendors and integrators). Those respondents with relevant capabilities or product components signed a Cooperative Research and Development Agreement (CRADA) to collaborate with NIST in a consortium to build this example solution.

Certain commercial entities, equipment, products, or materials may be identified by name or company logo or other insignia in order to acknowledge their participation in this collaboration or to describe an experimental procedure or concept adequately. Such identification is not intended to imply special status or relationship with NIST or recommendation or endorsement by NIST or NCCoE; neither is it intended to imply that the entities, equipment, products, or materials are necessarily the best available for the purpose.