



Achieving Continuous Cybersecurity Compliance in AWS

PRESENTED BY:

Gabriel Tocci

Housekeeping

All participants are automatically muted by webinar administrators.



Please use the Q&A section to submit questions.



Webinar will be recorded for future use.



▶ **Strata Information Group**

Meet the Presenter



Gabriel Tocci

Sr. Cloud Architect / Sr. Consultant

Senior cloud architect with deep expertise in Amazon Web Services (AWS), Oracle Cloud (OCI), Kubernetes (K8s), Infrastructure as Code (IaC), and various HigherEd enterprise systems.

Been working in Higher Education for two decades finding new ways to leverage these technologies so colleges and universities can focus on their mission of improving student success/outcomes.

An AWS user since 2012 and running production Enterprise systems in AWS since 2016.

AGENDA

- 01 AWS Security Services Summary
- 02 AWS Security Hub
- 03 Finding Data
- 04 Security Hub Events
- 05 AWS Audit Manager
- 06 Getting Started
- 07 Alternative Solutions (OpenSource & SaaS)

A photograph of four young adults, two men and two women, walking through a brightly lit hallway with large arched windows. They are all smiling and appear to be students. The man on the far left is wearing a white long-sleeved shirt and jeans, carrying a black backpack. The woman next to him is wearing a striped shirt and jeans, carrying a black backpack and holding books. The man on the far right is wearing a denim shirt over a white t-shirt and jeans, carrying a backpack and holding a water bottle. The woman next to him is wearing a white button-down shirt over a grey top and jeans, carrying a black bag. A blue square with the number '01' is overlaid on the left side of the image.

01

AWS SECURITY SERVICES

AWS Security Portfolio

Identity and Access Management



IAM



SSO



Organizations

Infrastructure Protection



Shield



WAF

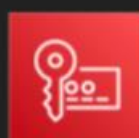


Network Firewall



Firewall Manager

Data Protection



Key Management Services



Cloud HSM



Macie



Secrets Manager



Certificates Manager

Detection & Response



Guard Duty



Inspector



Detective



Security Hub

Governance & Compliance



Systems Manager



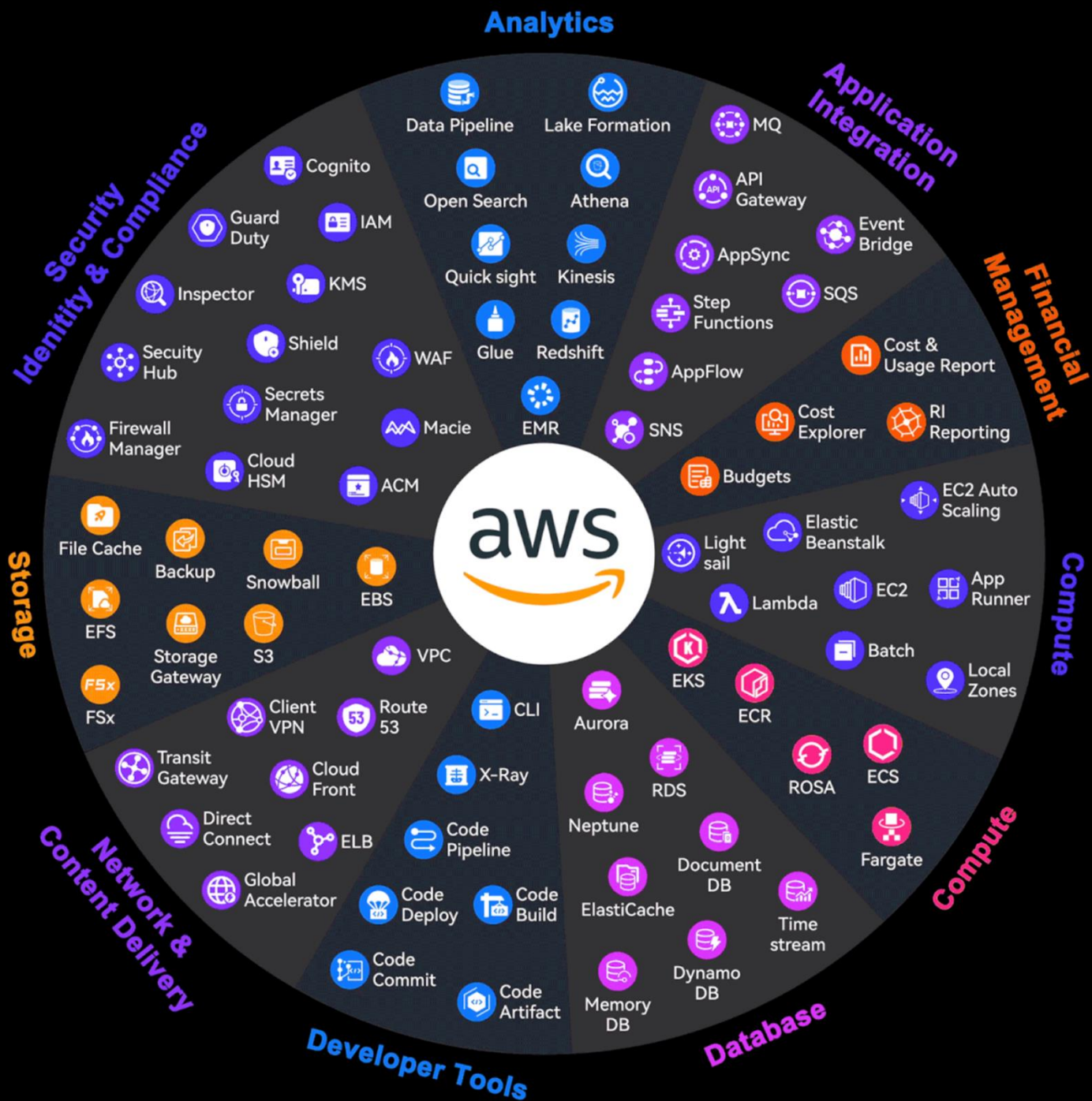
Config



Artifact



Audit Manager





02

AWS SECURITY HUB

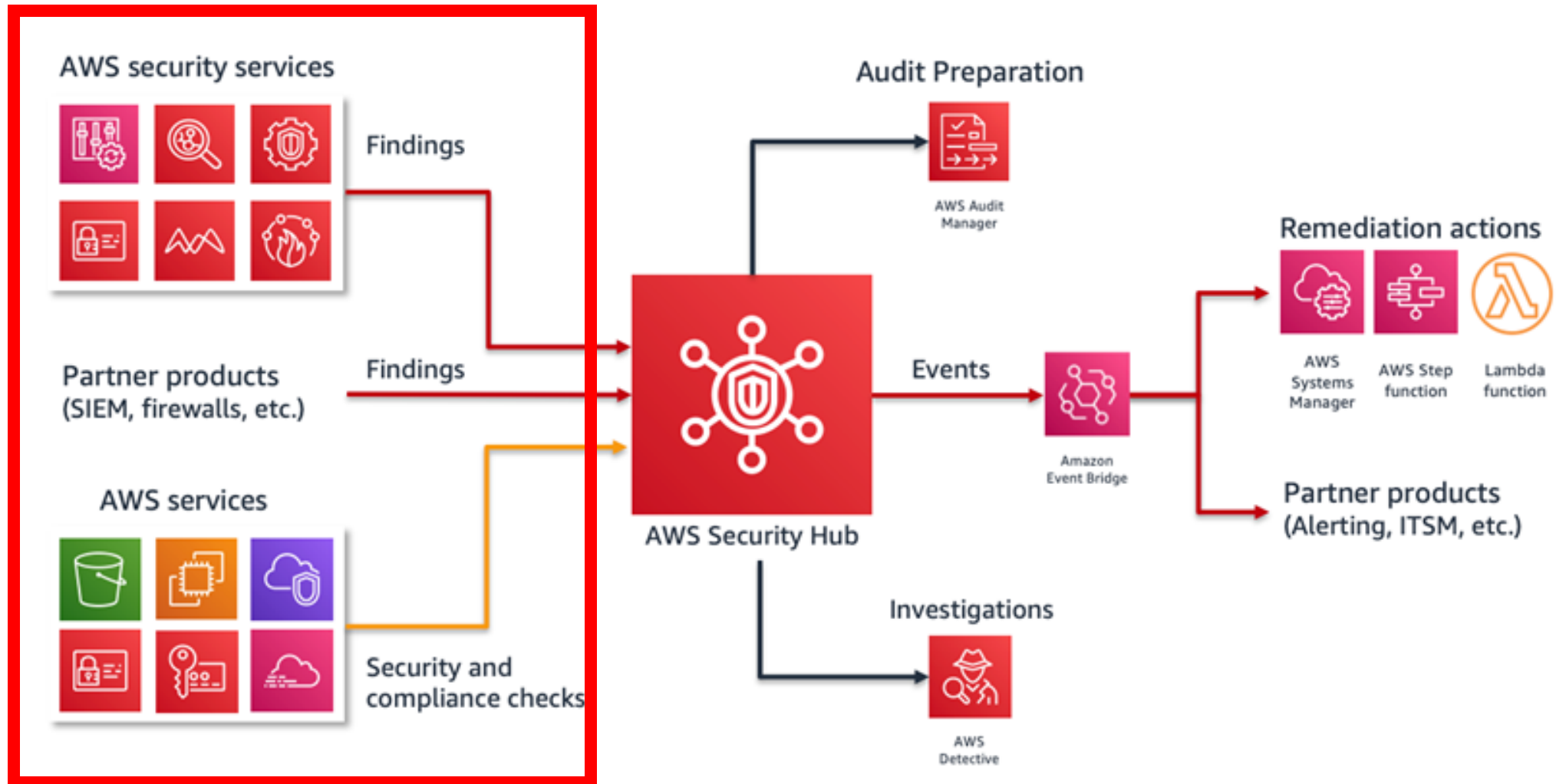


Integrated AWS service	Direction
AWS Config	Sends findings
AWS Firewall Manager	Sends findings
Amazon GuardDuty	Sends findings
AWS Health	Sends findings
AWS Identity and Access Management Access Analyzer	Sends findings
Amazon Inspector	Sends findings
AWS IoT Device Defender	Sends findings
Amazon Macie	Sends findings
AWS Systems Manager Patch Manager	Sends findings
AWS Audit Manager	Receives findings
Amazon Q Developer in chat applications	Receives findings
Amazon Detective	Receives findings
Amazon Security Lake	Receives findings
AWS Systems Manager Explorer and OpsCenter	Receives and updates findings
AWS Trusted Advisor	Receives findings



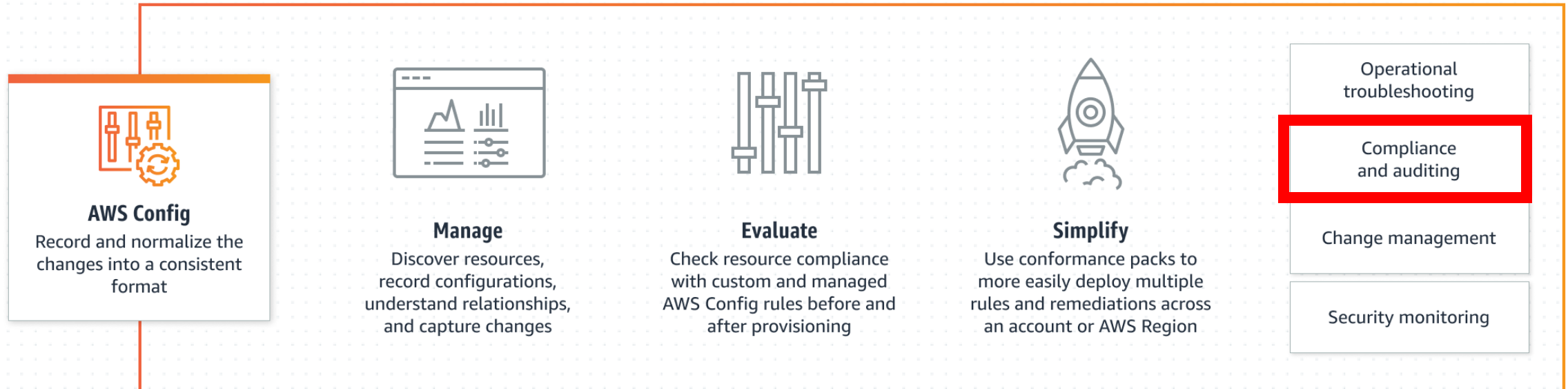
03

SECURITY FINDINGS





AWS Config



AWS Config

- Findings are AWS Resource Configuration Setting Values
- Scans 300+ AWS Resource Types for Configuration Settings
- Four Possible Evaluation Results for AWS Config Rules

Evaluation result	Description
COMPLIANT	The rule passes the conditions of the compliance check.
NON_COMPLIANT	The rule fails the conditions of the compliance check.
ERROR	The one of the required/optional parameters is not valid, not of the correct type, or is formatted incorrectly.
NOT_APPLICABLE	Used to filter out resources that the logic of the rule cannot be applied to. For example, the alb-desync-mode-check rule only checks Application Load Balancers, and ignores Network Load Balancers and Gateway Load Balancers.

encrypted-volumes

Rule details

Description

Checks if attached Amazon EBS volumes are encrypted and optionally are encrypted with a specified KMS key. The rule is NON_COMPLIANT if attached EBS volumes are unencrypted or are encrypted with a KMS key not in the supplied parameters.

Config rule ARN

arn:aws:config:us-east-1:██████████7:config-rule/config-rule-f2ttow

Enabled evaluation mode

- DETECTIVE

Last successful detective evaluation

⌚ Not available

Detective evaluation trigger type

- Oversized configuration changes
- Configuration changes

Scope of changes

Resources

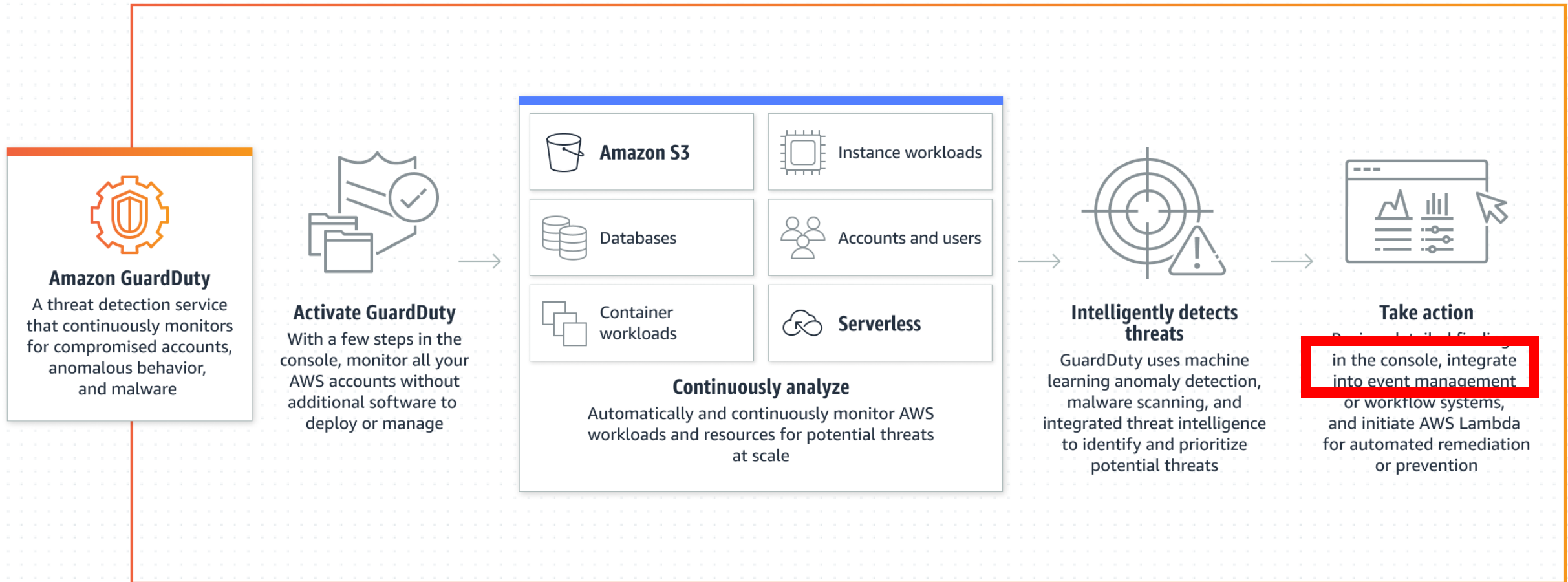
Resource types

EC2 Volume

Parameters

Key	Type	Value	Description
kmsId	String	-	ID or ARN of the KMS key that is used to encrypt the volume.

Guard Duty



Guard Duty

- Findings are (potentially) Malicious Activity In
 - VPC Flow Logs
 - DNS Logs
 - CloudTrail Events
 - S3 Data Access
 - Kubernetes Clusters Audit Logs
 - RDS Database Login Activity
- Types of Findings
 - Anomalies in behavior (AWS and Network)
 - Launching New Instances
 - Changing Network Rules
 - Service/Data Access Patterns
- Types of Attacks
 - Bitcoin Mining
 - Command & Control
 - Anonymous Connections

Amazon Macie



Amazon Macie
Enable Amazon Macie with one-click in the AWS Management Console or a single API call



Continually evaluate your S3 environment
Automatically generates an inventory of S3 buckets and details on the bucket-level security and access controls



Discover sensitive data
Analyzes buckets using machine learning and pattern matching to discover sensitive data, such as personally identifiable information (PII)



Take action
Generates findings and sends to Amazon CloudWatch Events for integration into workflows and remediation actions

Amazon Macie

Credentials

To detect occurrences of credentials data in S3 objects, Macie uses the following managed data identifiers by default.

Sensitive data type	Managed data identifier ID
AWS secret access key	AWS_CREDENTIALS
HTTP Basic Authorization header	HTTP_BASIC_AUTH_HEADER
OpenSSH private key	OPENSSH_PRIVATE_KEY
PGP private key	PGP_PRIVATE_KEY
Public Key Cryptography Standard (PKCS) private key	PKCS
PuTTY private key	PUTTY_PRIVATE_KEY

Financial information

To detect occurrences of financial information in S3 objects, Macie uses the following managed data identifiers by default.

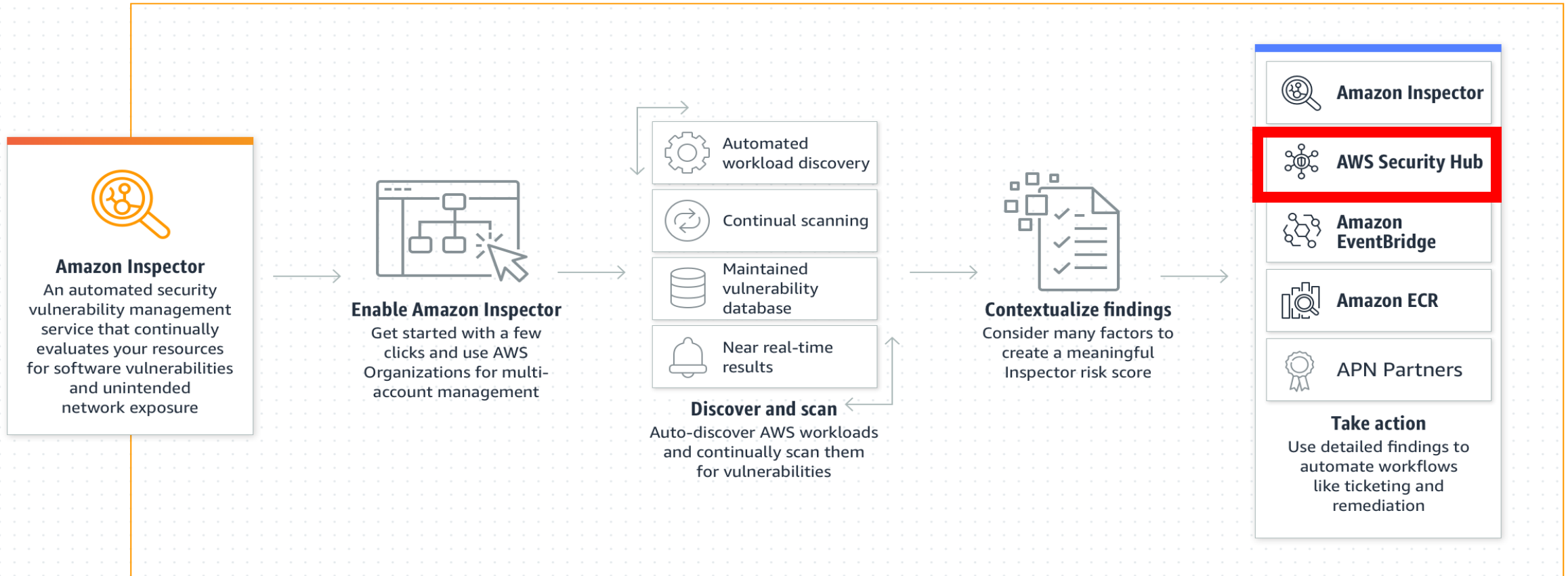
Sensitive data type	Managed data identifier ID
Credit card magnetic stripe data	CREDIT_CARD_MAGNETIC_STRIPE
Credit card number	CREDIT_CARD_NUMBER (for credit card numbers in proximity of a keyword)

Personally identifiable information (PII)

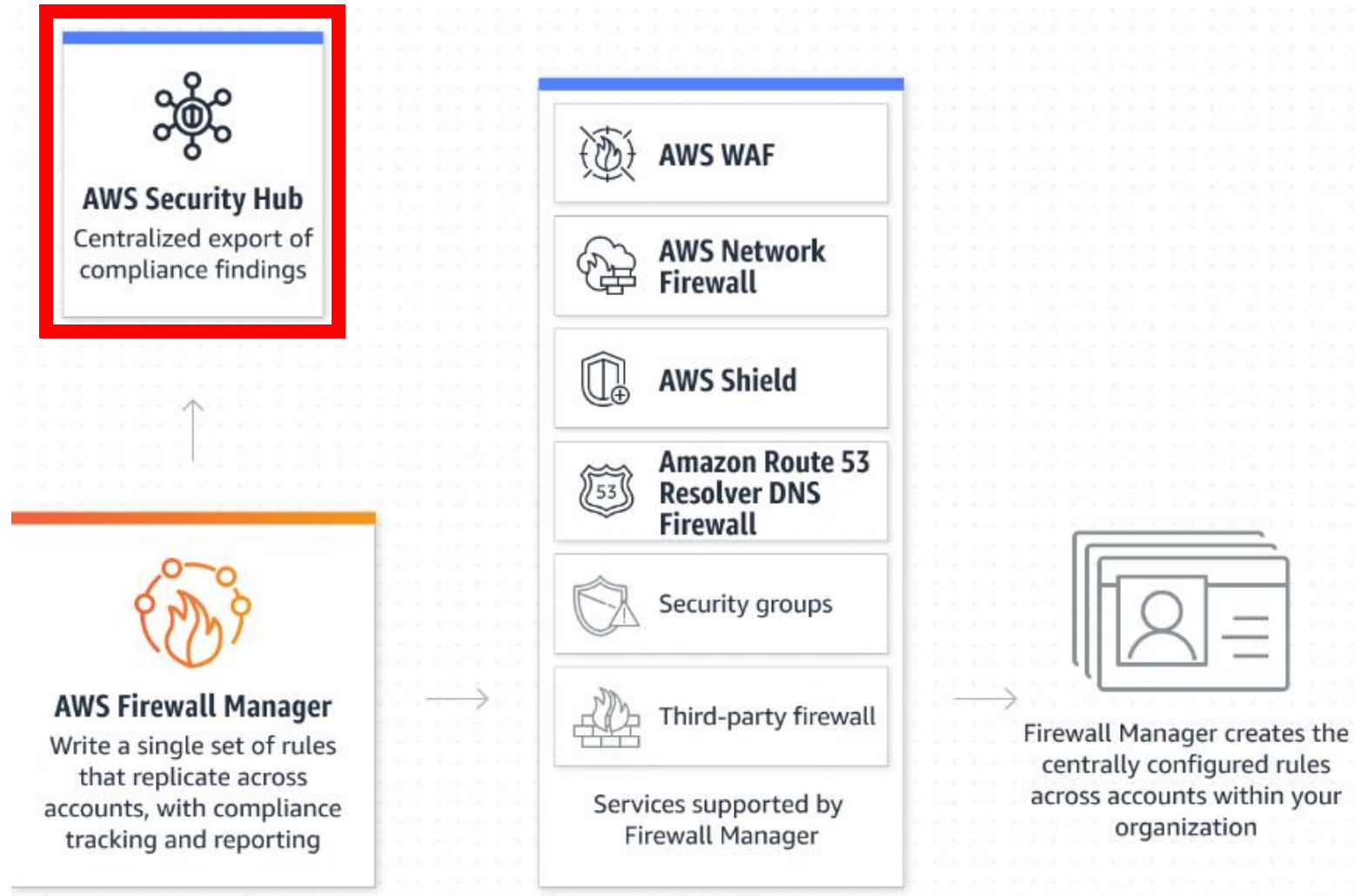
To detect occurrences of personally identifiable information (PII) in S3 objects,

Sensitive data type	Managed data identifier ID
Driver's license identification number	CANADA_DRIVERS_LICENSE, DRIVERS_LI
Electoral roll number	UK_ELECTORAL_ROLL_NUMBER
National identification number	FRANCE_NATIONAL_IDENTIFICATION_NUM ITALY_NATIONAL_IDENTIFICATION_NUME
National Insurance Number (NINO)	UK_NATIONAL_INSURANCE_NUMBER
Passport number	CANADA_PASSPORT_NUMBER, FRANCE_PAS SPAIN_PASSPORT_NUMBER, UK_PASSPORT
Social Insurance Number (SIN)	CANADA_SOCIAL_INSURANCE_NUMBER
Social Security number (SSN)	SPAIN_SOCIAL_SECURITY_NUMBER, USA_
Taxpayer identification or reference number	AUSTRALIA_TAX_FILE_NUMBER, BRAZIL_ GERMANY_TAX_IDENTIFICATION_NUMBER, USA_INDIVIDUAL_TAX_IDENTIFICATION_

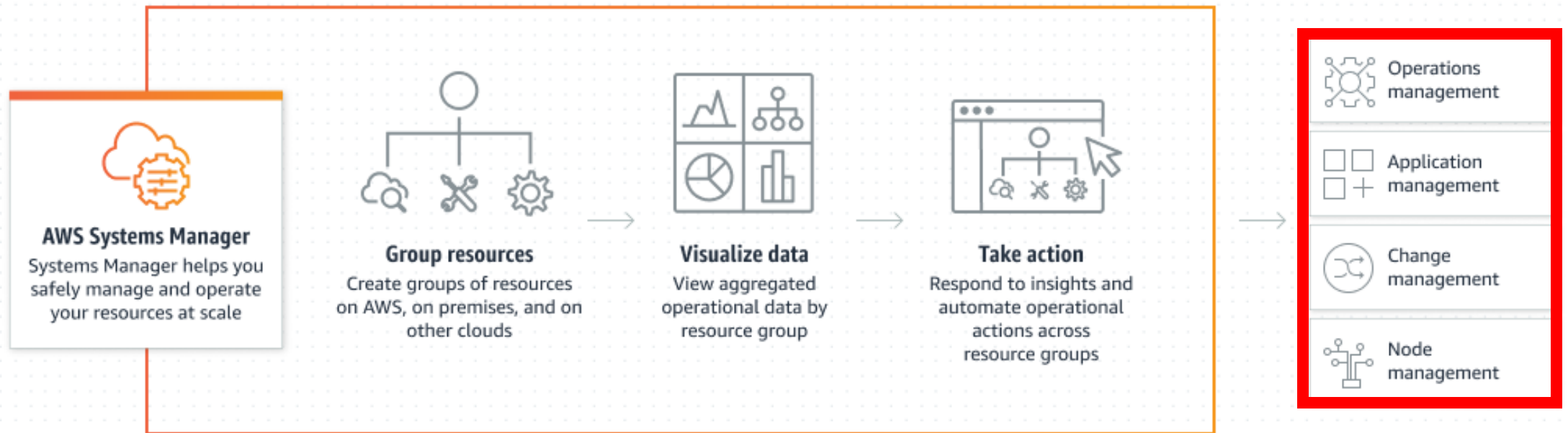
Amazon Inspector



AWS Firewall Manager



AWS Systems Manager



IAM Access Analyzer

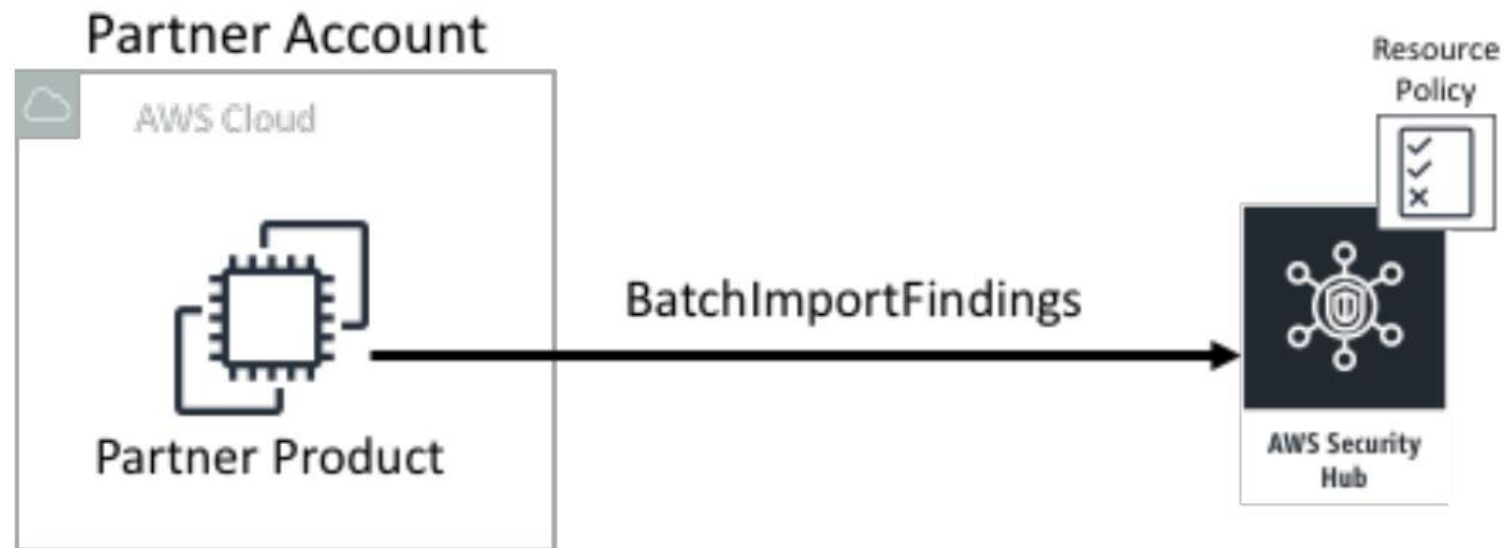
- Findings include
 - Unused
 - Roles
 - Access keys
 - Passwords
 - IAM Policy Review

Custom and Third-Party Sources



Firewalls f5 paloalto Barracuda Check Point FORTINET	Endpoint CROWDSTRIKE TREND MICRO Symantec SOPHOS
Vulnerability tenable Qualys RAPID7	Compliance paloalto Check Point Qualys Cloud Custodian
SOAR DEMISTO Turbot splunk>	MSSP ARMOR ALERT LOGIC AWS Managed Services
SIEM sumologic IBM Security splunk>	Other McAfee CYBERARK Twistlock

AWS Security Finding Format (ASFF / JSON)



Ref: <https://docs.aws.amazon.com/securityhub/latest/userguide/securityhub-findings-format.html>



04

SECURITY HUB EVENTS

AWS security services



Findings

Partner products
(SIEM, firewalls, etc.)

Findings

AWS services



Security and
compliance checks

Audit Preparation



AWS Audit
Manager



AWS Security Hub

Events



Amazon
Event Bridge

Remediation actions



AWS
Systems
Manager



AWS Step
function



Lambda
function

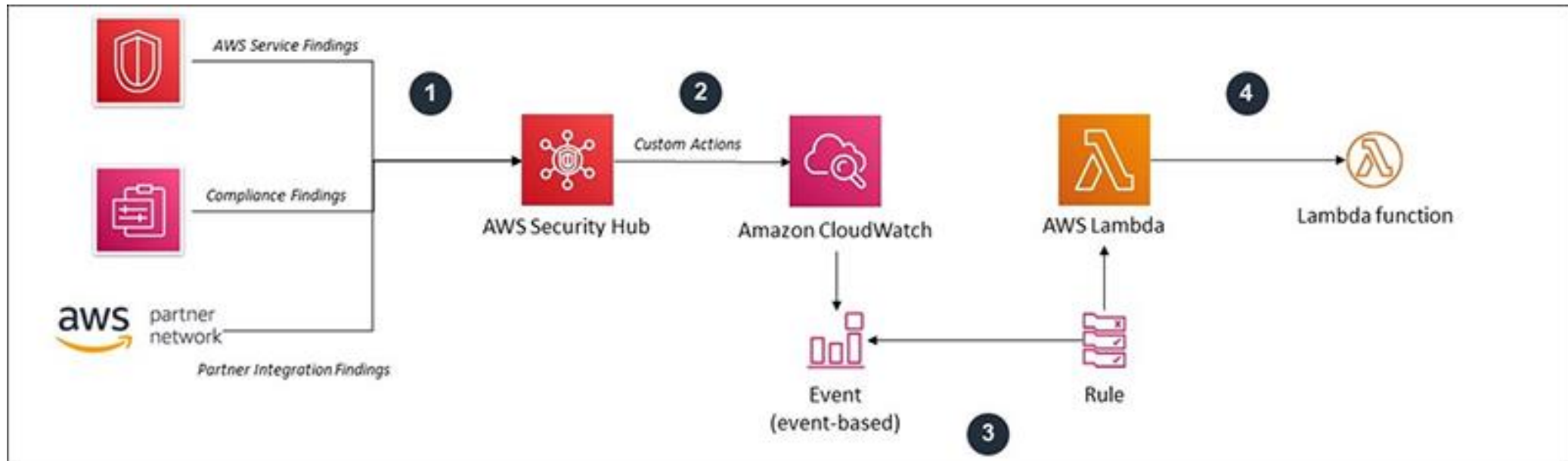
Partner products
(Alerting, ITSM, etc.)

Investigations

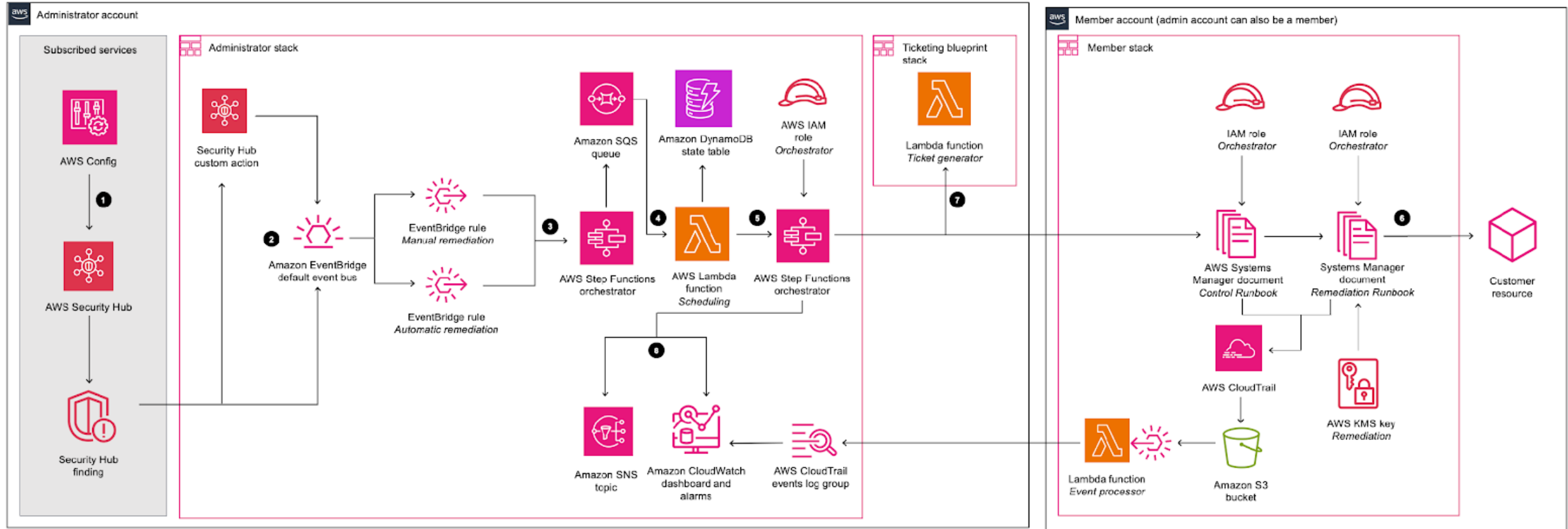


AWS
Detective

Response and Remediation - 2020



Response and Remediation - 2025

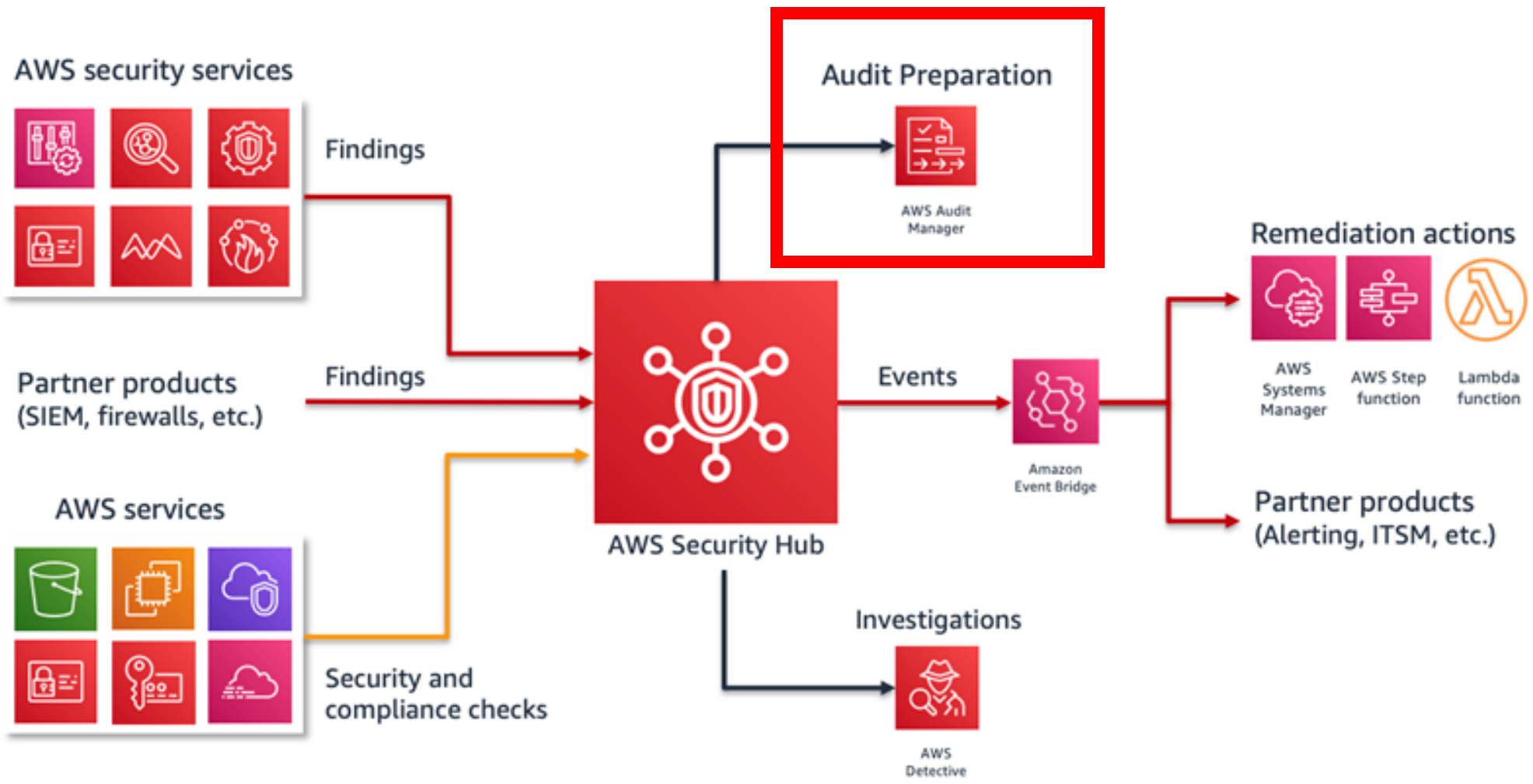


Ref: <https://aws.amazon.com/solutions/implementations/automated-security-response-on-aws/#>

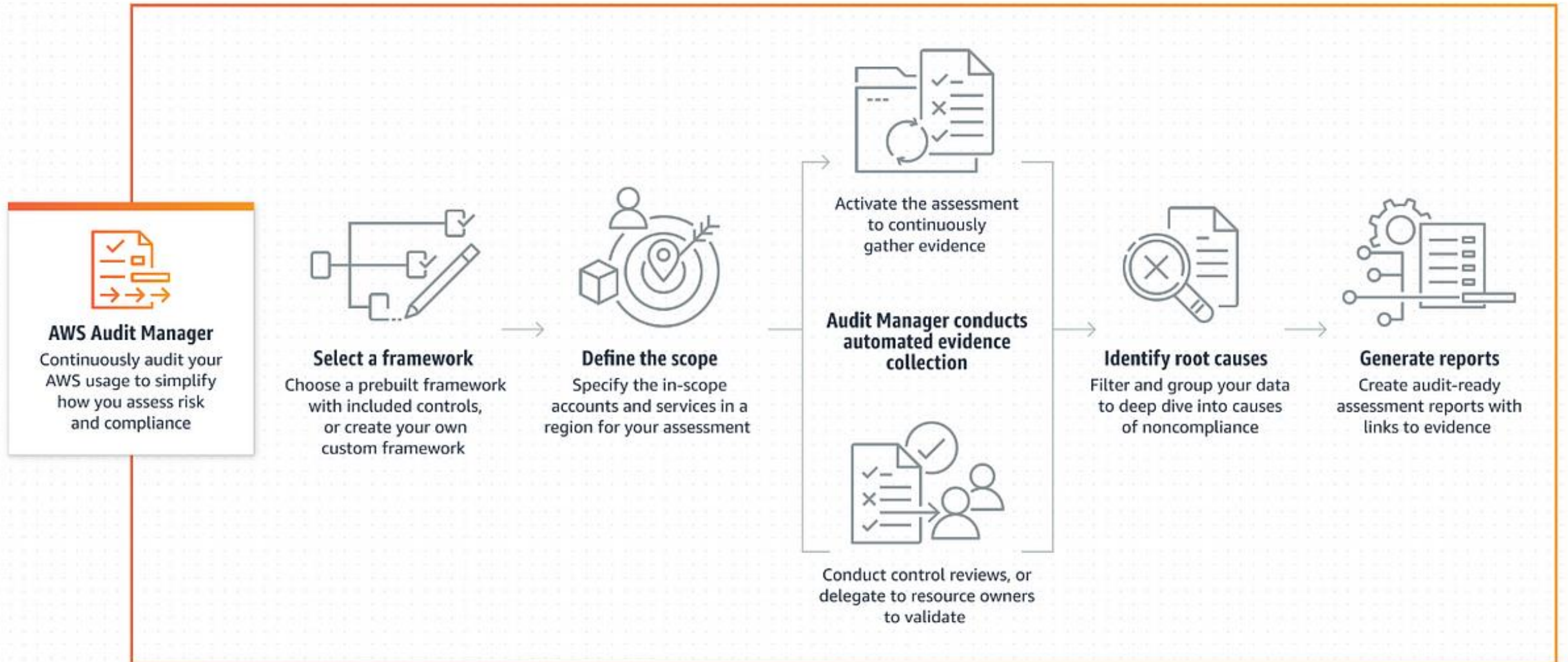
A background graphic featuring a series of interlocking gears of various sizes. Each gear contains a white icon: a magnifying glass, a laptop with checkmarks, a network diagram, a seal with a checkmark, three server racks, a clipboard with a checklist, a globe, three interlocking gears, a large checkmark (highlighted in blue), and a document with a key. A hand is visible on the right side, pointing towards the large blue checkmark gear.

05

AWS AUDIT MANAGER



AWS Audit Manager



Security Frameworks in Audit Manager

ACSC Essential Eight

ACSC ISM 02 March 2023

AWS Audit Manager Sample Framework

AWS Control Tower Guardrails

AWS Generative AI Best Practices Framework v2

AWS License Manager

AWS Foundational Security Best Practices

AWS Operational Best Practices

AWS Well Architected Framework WAF v10

CCCS Medium Cloud Control

CIS AWS Benchmark v1.2.0

CIS AWS Benchmark v1.3.0

CIS AWS Benchmark v1.4.0

CIS Controls v7.1, IG1

CIS Critical Security Controls version 8.0, IG1

FedRAMP Security Baseline Controls r4

GDPR 2016

Gramm-Leach-Bliley Act

Title 21 CFR Part 11

EU GMP Annex 11, v1

HIPAA Security Rule: Feb 2003

HIPAA Omnibus Final Rule

ISO/IEC 27001:2013 Annex A

NIST SP 800-53 Rev 5

NIST Cybersecurity Framework v1.1

NIST SP 800-171 Rev 2

PCI DSS V3.2.1

PCI DSS V4.0

SSAE-18 SOC 2

Common Security Frameworks

Standard frameworks (1/32) Create assessment from framework Create custom framework ▼

Search 5 matches

NIST X Clear filters < 1 > ⚙

Framework name	Compliance type	Control sets	Controls
<input type="radio"/> Health Insurance Portability and Accountability Act (HIPAA) Security Rule: Feb 2003	HIPAA-Security-Rule-Feb-2003	5	85
<input checked="" type="radio"/> NIST 800-171 Revision 2: Protecting Controlled Unclassified Information in Nonfederal Systems a...	NIST-SP-800-171-r2	14	110
<input type="radio"/> NIST 800-53 Rev 5: Security and Privacy Controls for Information Systems and Organizations	NIST-SP-800-53-r5	20	1007
<input type="radio"/> NIST Cybersecurity Framework (CSF) v1.1	NIST-CSF-v1.1	22	108
<input type="radio"/> Title 21 Code of Federal Regulations (CFR) Part 11, Electronic records; Electronic Signatures - Sco...	Title-21-CFR-Part-11-24-May-2023	2	25

NIST 800-171

Controls (110)		
<input type="text" value="encrypt"/> 10 matches		
Controls grouped by control set	Type	Data sources
3.1 - Access Controls (22)	-	-
3.1.3: Control the flow of CUI in accordance with approved authorizations.	Standard	AWS API calls, AWS CloudTrail, AWS Config, AWS Security Hub
3.1.12: Monitor and control remote access sessions.	Standard	AWS API calls, AWS CloudTrail, AWS Config, AWS Security Hub
3.1.17: Protect wireless access using authentication and encryption	Standard	Manual
3.1.19: Encrypt CUI on mobile devices and mobile computing platforms.	Standard	Manual
3.5 - Identification and Authentication (11)	-	-
3.5.3: Use multifactor authentication for local and network access to privileged accounts and for network access to non-privileged accounts.	Standard	AWS API calls, AWS CloudTrail, AWS Config
3.8 - Media Protection (9)	-	-
3.8.1: Protect (i.e., physically control and securely store) system media containing CUI, both paper and digital.	Standard	Manual
3.8.6: Implement cryptographic mechanisms to protect the confidentiality of CUI stored on digital media during transport unless otherwise protected by alternative physical safeguards.	Standard	Manual
3.10 - Physical Protection (6)	-	-
3.10.2: Protect and monitor the physical facility and support infrastructure for organizational systems.	Standard	Manual
3.13 - System and Communications Protection (16)	-	-
3.13.1: Monitor, control, and protect communications (i.e., information transmitted or received by organizational systems) at the external boundaries and key internal boundaries of organizational systems.	Standard	AWS API calls, AWS CloudTrail, AWS Config, AWS Security Hub
3.13.4: Prevent unauthorized and unintended information transfer via shared system resources.	Standard	AWS Config

NIST 800-171

NIST 800-171 Revision 2: Protecting Controlled Unclassified Information in Nonfederal Systems and Organizations

Make a copy

Create assessment

Framework details

Description

The purpose of this publication is to provide federal agencies with recommended security requirements for protecting the confidentiality of Controlled Unclassified Information (CUI): (1) when the CUI is resident in a nonfederal system and organization; (2) 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; and (3) where there are no specific safeguarding requirements for protecting the confidentiality of CUI prescribed by the authorizing law, regulation, or government wide policy for the CUI category listed in the CUI Registry. <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-171r2.pdf>

Framework type

Standard

Date created

May 29, 2024, 20:00 (UTC+0:00)

Created by

auditmanager

Compliance type

NIST-SP-800-171-r2

Last updated

May 29, 2024, 20:00 (UTC+0:00)

Assessment details

Description

-

Compliance type

NIST-SP-800-171-r2

Assessment reports destination

s3://r



Total evidence

10964

Assessment report selection

1

Date created

May 8, 2025, 03:05 (UTC+0:00)

Last updated

May 8, 2025, 03:05 (UTC+0:00)

Status

Active

Controls

Assessment report selection

AWS accounts

Audit owners

Tags

Changelog

Control status summary [Info](#)

The control status specifies if AWS Audit Manager is actively collecting evidence for that control. It also indicates the evidence review status for active controls.

Total controls

110

Reviewed

0

Under review

110

Inactive

0

Control sets (14)

[Delegate control set](#)[Complete control set review](#)

Controls grouped by control set



3.1 - Access Controls (22)



[3.1.1: Limit system access to authorized users, processes acting on behalf of authorized users, and devices \(including other systems\).](#)



[3.1.2: Limit system access to the types of transactions and functions that authorized users are permitted to execute.](#)



[3.1.3: Control the flow of CUI in accordance with approved authorizations.](#)

Control status	Delegated to	Total evidence
Active	-	5488
Under review	-	868
Under review	-	872
Under review	-	4

Summary

Details

Date and time

May 12, 2025, 00:00 (UTC+0:00)

Total evidence

218

Control

[3.1.2: Limit system access to the types of transactions and functions that authorized users are permitted to execute. \(NIST-SP-800-171-r2\)](#)

Resources

187

Added to assessment report

0

Evidence by type

User Activity

1

Compliance check

1

Configuration data

216

Compliance check status

✓ 0 issues found

Manual

0

Evidence (1/100+) [Info](#)

Add manual evidence ▼

Remove from assessment report

Add to assessment report

🔍 Search

< 1 2 3 4 ... > ⚙️

<input type="checkbox"/>	Time ▼	Compliance check	Evidence by type ▼	Data source ▼	Event name ▼	Event source	Assessment report selection
<input type="checkbox"/>	02:40:36 AM UTC	Inconclusive	User activity	AWS CloudTrail	AttachRolePolicy	iam.amazonaws.com	No
<input checked="" type="checkbox"/>	02:20:32 AM UTC	✓ Compliant	Compliance check	AWS Config	PutEvaluations	config.amazonaws.com	No

3.2.1: Ensure that managers, systems administrators, and users of organizational systems are made aware of the security risks associated with their activities and of the applicable policies, standards, and procedures related to the security of those systems. (NIST-SP-800-171-r2)

Update control status ▼

File upload required

This control requires a file to be uploaded as manual evidence. You can review your manual evidence sources in the **Evidence sources** tab.

↑ Upload manual evidence



Control details

Description

Organizations determine the content and frequency of security awareness training and security awareness techniques based on the specific organizational requirements and the systems to which personnel have authorized access. The content includes a basic understanding of the need for information security and user actions to maintain security and to respond to suspected security incidents. The content also addresses awareness of the need for operations security. Security awareness techniques include: formal training; offering supplies inscribed with security reminders; generating email advisories or notices from organizational officials; displaying logon screen messages; displaying security awareness posters; and conducting information security awareness events. [SP 800-50] provides guidance on security awareness and training programs.

Control status

🕒 Under review

Evidence folders

Details

Evidence sources

Comments

Changelog

Evidence folders (0) [Info](#)

Info

Add manual evidence ▼

Remove from assessment report

Add to assessment report

Choose any folder to open it and manage the evidence that was gathered on that day.

Filter by time

🔍 *Search by evidence folder*

Last 7 days

0 match

< 1 >



Evidence folder



Compliance check

Total evidence

No collected evidence for this control

No collected evidence to display for this control.

Initial NIST 800-171 Info

[Edit](#)[Delete](#)[Update assessment status](#) ▼

Assessment details

Description

-

Compliance type

NIST-SP-800-171-r2

Total evidence

10964

Date created

May 8, 2025, 03:05 (UTC+0:00)

Status

⌂ Active

Assessment reports destination

s3://n



Assessment report selection

2

Last updated

May 8, 2025, 03:05 (UTC+0:00)

[Controls](#)[Assessment report selection](#)[AWS accounts](#)[Audit owners](#)[Tags](#)[Changelog](#)

Assessment report selection (2) Info

🔍 Search by evidence folder or control name

[Generate assessment report](#)

< 1 > ⚙️

Evidence folder

[AWS Audit Manager](#)[Download center](#)[2025-05-12](#)[2025-05-12](#)

Download center Info

After you generate an assessment report or export search results from [evidence finder](#), you can download the file from this page.

[Assessment reports](#)[Exports](#)

Assessment reports (1/1) Info

[Delete](#)[Download](#)

🔍 Filter assessment reports

< 1 > ⚙️

[Assessment report](#) ▼[Status](#) ▼[Assessment](#) ▼[Date created](#) ▼
(UTC+0:00)[Author](#)[Description](#)[MyNIST800171Report](#)

🟢 Ready

[Initial NIST 800-171](#)

May 12, 2025, 19:29

-

Overview

Report summary	
Report name	MyNIST800171Report
Description	-
Date generated	May 12, 2025 at 7:29:05 PM UTC
Total controls included	2
AWS accounts included	
Assessment report selection	2 (2 Compliant , 0 Non-compliant , 0 Inconclusive)

Assessment summary	
Assessment name	Initial NIST 800-171
Status	ACTIVE
Assessment Region	us-east-1
AWS accounts in scope	
Framework name	NIST 800-171 Revision 2: Protecting Controlled Unclassified Information in Nonfederal Systems and Organizations
Audit owners	
Last updated	May 8, 2025 at 3:05:43 AM UTC

3.1.1: Limit system access to authorized users, processes acting on behalf of authorized users, and devices (including other systems). (NIST-SP-800-171-r2)

Control summary	
Control name	3.1.1: Limit system access to authorized users, processes acting on behalf of authorized users, and devices (including other systems). (NIST-SP-800-171-r2)
Description	Access control policies (e.g., identity- or role-based policies, control matrices, and cryptography) control access between active entities or subjects (i.e., users or processes acting on behalf of users) and passive entities or objects (e.g., devices, files, records, and domains) in systems. Access enforcement mechanisms can be employed at the application and service level to provide increased information security. Other systems include systems internal and external to the organization. This requirement focuses on account management for systems and applications. The definition of and enforcement of access authorizations, other than those determined by account type (e.g., privileged verses non-privileged) are addressed in requirement 3.1.2.
Control set	3.1 - Access Controls
Testing information	-
Action plan	-
Assessment report selection	1 (1 Compliant, 0 Non-compliant, 0 Inconclusive)



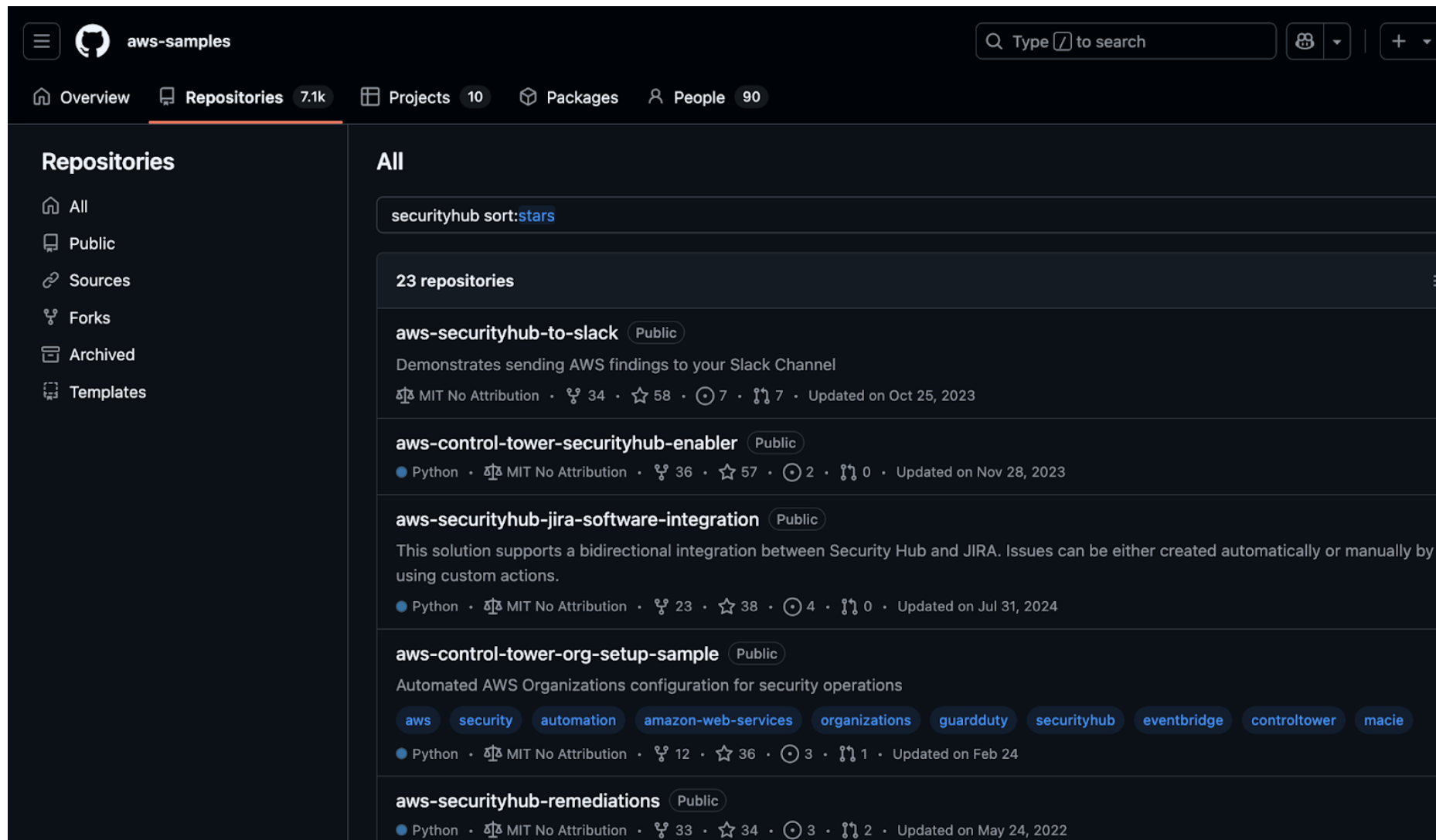
06

GETTING STARTED

Minimum Viable Stack



Infrastructure as Code - GitHub



The screenshot shows the GitHub interface for the 'aws-samples' repository. The 'Repositories' tab is selected, showing a list of 23 repositories. The left sidebar contains navigation links: All, Public, Sources, Forks, Archived, and Templates. The main content area displays a list of repositories, each with its name, a 'Public' badge, a description, and statistics (MIT No Attribution, forks, stars, issues, pull requests, and update date).

Repositories

- All
- Public
- Sources
- Forks
- Archived
- Templates

All

securityhub sort:stars

23 repositories

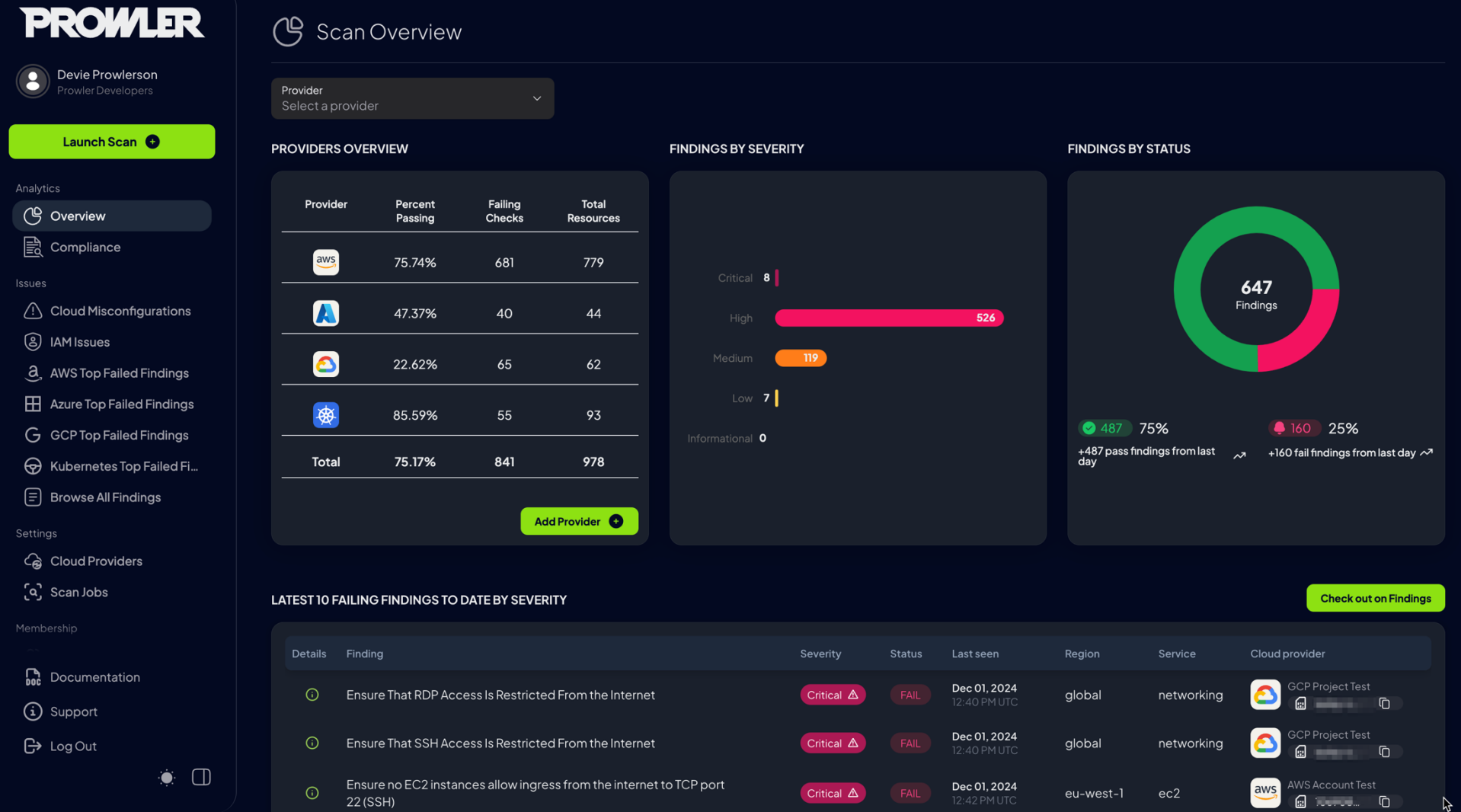
- aws-securityhub-to-slack** (Public)
Demonstrates sending AWS findings to your Slack Channel
MIT No Attribution · 34 forks · 58 stars · 7 issues · 7 pull requests · Updated on Oct 25, 2023
- aws-control-tower-securityhub-enabler** (Public)
Python · MIT No Attribution · 36 forks · 57 stars · 2 issues · 0 pull requests · Updated on Nov 28, 2023
- aws-securityhub-jira-software-integration** (Public)
This solution supports a bidirectional integration between Security Hub and JIRA. Issues can be either created automatically or manually by using custom actions.
Python · MIT No Attribution · 23 forks · 38 stars · 4 issues · 0 pull requests · Updated on Jul 31, 2024
- aws-control-tower-org-setup-sample** (Public)
Automated AWS Organizations configuration for security operations
aws security automation amazon-web-services organizations guardduty securityhub eventbridge controltower macie
Python · MIT No Attribution · 12 forks · 36 stars · 3 issues · 1 pull request · Updated on Feb 24
- aws-securityhub-remediations** (Public)
Python · MIT No Attribution · 33 forks · 34 stars · 3 issues · 2 pull requests · Updated on May 24, 2022



07

ALTERNATIVE SOLUTIONS

Open Source - Prowler



SaaS - Vanta

Controls

Policies

Documents

TRUST ▾

Trust Center

Questionnaires

Audits

RISK ▾

Risk management

Access

Vendors

Vulnerabilities

ORGANIZATION ▾

People

Computers

Inventory

Integrations

Settings

Product updates

Enter sandbox

Risk management

ASSESSMENT

Overview Beta

Register

Library

Action tracker

Settings

SNAPSHOTS

Oct 12, 2023 Shared

Sep 26, 2023 Shared

Sep 26, 2023 Shared

Sep 25, 2023 Shared

Jul 13, 2023 Shared

Jul 13, 2023 Shared

Jun 29, 2023 Shared

Jun 13, 2023 Shared

Jun 09, 2023

Jun 07, 2023

May 14, 2023 Shared

May 03, 2023 Shared

Risk treatment

Make sure all your risks are assessed and approved. Once your risks are approved, complete tasks and ensure all controls relating to risks are passing.

Number of risks by treatment type

Treatment Type	Approved	Not approved
Accept	0	5
Avoid	2	5
Mitigate	2	42
Transfer	2	16
None	0	12

Task status

You have 18 overdue tasks [View tasks](#)

32

Total tasks

Completed 13

Incomplete 19

Control status

110

Total controls

OK 12

Not OK 98

QUESTIONS?



WWW.SIGCORP.COM

Contact

Gabriel Tocci

Sr. Cloud Architect / Sr. Consultant

tocci@sigcorp.com

 /strata-information-group

 @SIGCorpLIVE

 sigcorp.com