01 Sdlc Overview

SECURAA Security Documentation

SECURAA Secure Software Development Lifecycle (SDLC)

Comprehensive Production-Ready SDLC Process Documentation

Document Control

Document Title	SECURAA Secure SDLC Process - Overview
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Executive Summary

This document describes the comprehensive Secure Software Development Lifecycle (SDLC) implemented at SECURAA for developing, testing, deploying, and maintaining our Security Orchestration, Automation and Response (SOAR) platform. Our SDLC integrates security at every phase of development, from initial requirements gathering through production operations and maintenance.

Key Highlights

- **Security-First Approach**: Security integrated into every phase of development
- **Cloud-Native Infrastructure**: Built on AWS services (CodeCommit, CodeBuild, ECR, IAM)
- **Automated Security**: Continuous security testing and vulnerability scanning
- **Compliance-Ready**: Aligned with SOC 2, ISO 27001, and GDPR requirements
- **Microservices Architecture**: 530+ microservices with containerized deployment
- **Multi-Repository Structure**: Organized codebase across specialized repositories

SDLC Process Overview

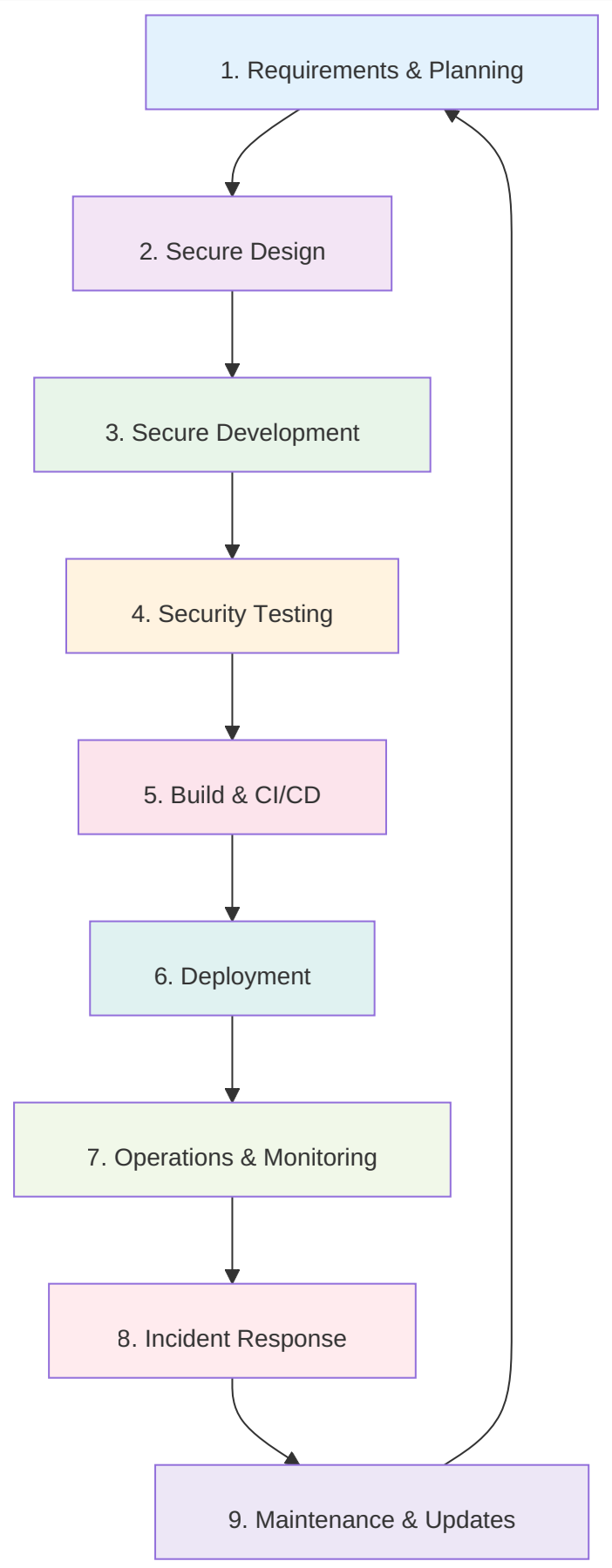
1. Requirements & Planning
2. Secure Design
3. Secure Development
4. Security Testing
5. Build & CI/CD
6. Deployment
7. Operations & Monitoring
8. Incident Response
9. Maintenance & Updates

Table of Contents

This comprehensive SDLC documentation is organized into the following sections:

    - Deployment Automation
7. **Operations & Monitoring Phase**
    - Security Monitoring
    - Log Management
    - Performance Monitoring
    - Incident Detection
8. **CI/CD Security Pipeline**
    - Automated Security Scanning
    - Build Pipeline Security
    - Deployment Pipeline Security

SDLC Core Principles

1. Security by Design

Security is not an afterthought but a fundamental requirement integrated from the earliest stages of development.

Implementation: - Threat modeling conducted for all new features - Security requirements defined alongside functional requirements - Security architecture review before implementation begins - Secure coding standards enforced through automated tools

2. Defense in Depth

Multiple layers of security controls protect against various threat vectors.

Implementation: - Network security (VPC, security groups, NACLs) - Application security (input validation, authentication, authorization) - Data security (encryption at rest and in transit) - Infrastructure security (IAM policies, least privilege access) - Monitoring and detection (logging, alerting, SIEM integration)

3. Least Privilege

Users, services, and applications are granted the minimum permissions necessary to perform their functions.

Implementation: - IAM roles with minimal required permissions - Service accounts with specific scope - Regular access reviews and permission audits - Time-bound elevated access for administrative tasks

4. Continuous Security

Security is continuously assessed and improved throughout the development lifecycle and production operations.

Implementation: - Automated security scanning in CI/CD pipeline - Regular vulnerability assessments - Continuous monitoring and alerting - Security metrics and KPIs tracking - Regular security training and awareness

5. Shift Left Security

Security testing and validation occur as early as possible in the development process.

Implementation: - Security requirements in planning phase - Threat modeling during design - SAST tools during development - Pre-commit hooks for security checks - Automated security tests in CI/CD

6. Automation First

Security processes are automated wherever possible to ensure consistency and reduce human error.

Implementation: - Automated security scanning (SAST, DAST, dependency checks) - Automated compliance checks - Automated deployment with security gates - Automated incident detection and alerting - Automated remediation for known issues

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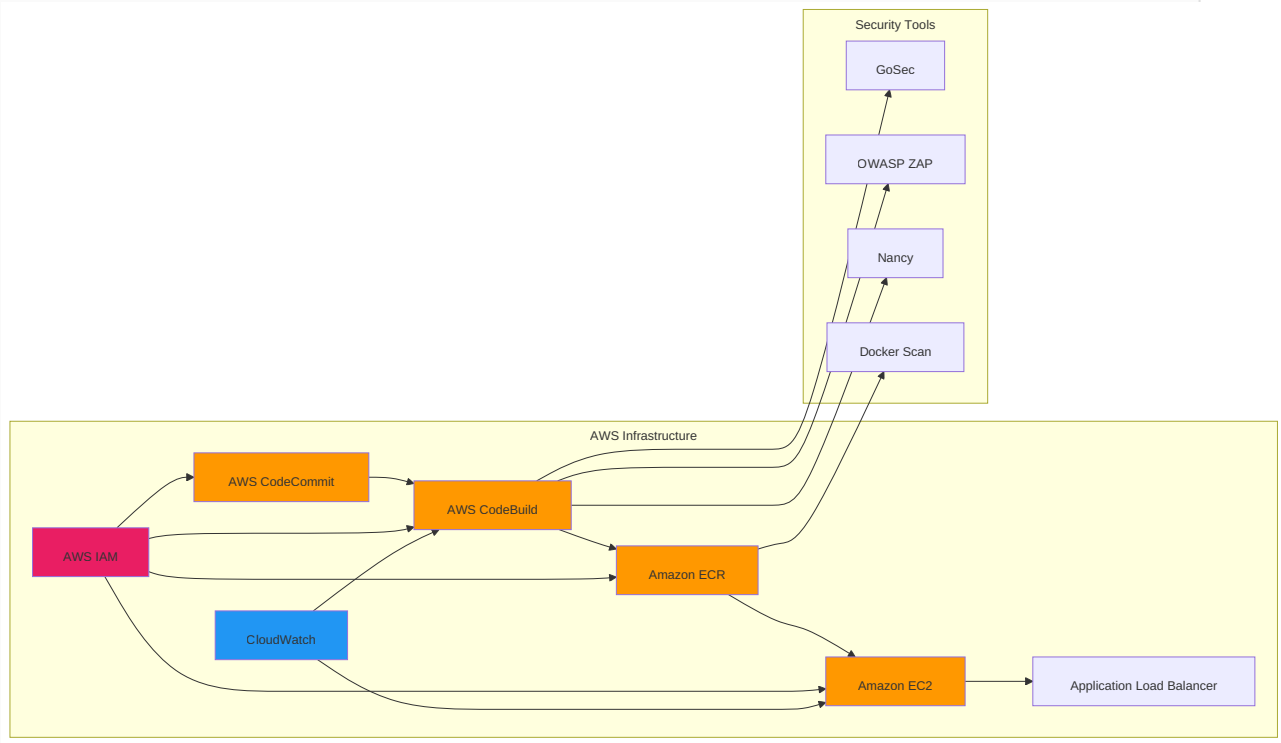
Technology Stack

Development Languages

Language	Usage	Version	Security Tools
Go	Backend services, microservices	1.17+	GoSec, Nancy, govulncheck
JavaScript/React	Frontend UI	React 18.2+	ESLint Security, npm audit
Python	Utilities, batch processing	3.8+	Bandit, Safety

Language	Usage	Version	Security Tools
Shell Script	Deployment automation	Bash	ShellCheck

Infrastructure & DevOps



Core Infrastructure Components:

1. **AWS CodeCommit**
   - Private Git repositories
   - Branch protection rules
   - Pull request workflows
   - IAM-based access control
2. **AWS CodeBuild**
   - Automated build pipeline
   - Security scanning integration
   - Docker image building
   - Artifact generation (RPM packages)
3. **Amazon ECR (Elastic Container Registry)**
   - Private Docker image registry

    - Image vulnerability scanning
    - Image signing and verification
    - Lifecycle policies for image management
4. **AWS IAM (Identity and Access Management)**
    - Role-based access control (RBAC)
    - Service roles for automation
    - Policy-based permissions
    - Multi-factor authentication (MFA)
5. **Amazon EC2**
    - Application hosting
    - Security groups for network isolation
    - Encrypted EBS volumes
    - Systems Manager for patch management
6. **AWS CloudWatch**
    - Application logging
    - Metrics collection
    - Security event monitoring
    - Alerting and notifications

Database & Storage

Technology	Purpose	Security Features
MongoDB 7.0	Primary database	Authentication, encryption at rest, TLS
PostgreSQL	Relational data	Role-based access, SSL/TLS, encrypted
Amazon S3	Object storage	Encryption, versioning, access logging
InfluxDB	Time-series metrics	Authentication, HTTPS

Container & Orchestration

Technology	Purpose	Security Features
Docker	Containerization	Image scanning, rootless containers
Docker Compose	Local development	Network isolation, secrets management

Technology	Purpose	Security Features
Docker Swarm	Production orchestration	Encrypted overlay networks, secrets

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Repository Structure

SECURAA's codebase is organized across multiple specialized repositories:

Core Repositories

1. build_securaa

Purpose: Build automation, deployment scripts, CI/CD configuration

Contents: - Build scripts (`build_securaa.sh`) - AWS CodeBuild specifications (`Core_BuildSpec.yaml` , `Wrapper_BuildSpec.yaml`) - Deployment automation (`deployment_scripts/`) - Package building (RPM, DEB) - Database migration scripts - Installation scripts

Key Files:

```
build_securaa/
├── build_securaa.sh              # Main build orchestration
├── aws_codebuild/
│   ├── Core_BuildSpec.yaml       # Core services build
│   └── Wrapper_BuildSpec.yaml    # Integration services build
├── core_scripts/
│   ├── functions_aws.sh          # AWS-specific functions
│   └── docker_ecr_login.sh       # ECR authentication
├── deployment_scripts/           # Deployment automation
├── pkg/                          # Package definitions
└── securaa/                      # Core application code
```

2. zona_services

Purpose: Core microservices (530+ services)

Service Categories: - User management (`zona_user`) - Integration orchestration (`zona_integrations`) - SIEM connectors (`zona_siem`) - Playbook execution (`zona_playbook`) - Query builder (`zona_querybuilder`) - Custom utilities (`zona_custom` , `zona_custom_utils`) - API management (`zona_apis_manager`) - SSH

client (`zona_sshclient`) - PDF generation (`zona_pdf`) - Health monitoring (`zona_primary_server_health_check`) - Shard management (`zona_shard_handler`) - SIA APIs (`zona_sia_apis`)

Architecture: - Each service is independently deployable - Microservices communicate via REST APIs - Service discovery and registration - Containerized deployment

3. securaa

Purpose: Core application backend logic

Components: - Authentication and authorization - API endpoints - Business logic - Database operations - Common utilities

4. securaa_lib

Purpose: Shared security library

Features: - Encryption/decryption (`encrypt_decrypt/`) - JWT token management - Cryptographic operations (AES-256) - Security utilities - Authentication helpers

Key Implementation:

```
// AES-256-CBC encryption
func CredentialsEncrypt(data string, key string) (string, error)
func CredentialsDecrypt(encrypted string, key string) (string, error)
```

5. zona_batch

Purpose: Background batch processing

Batch Jobs: - `core_process_batch` - Core data processing - `csam_connector` - CSAM integration - `auto_purge_batch` - Data retention enforcement - `report_batch` - Report generation - `sbot` - Security bot automation - `sla_breach_monitor_batch` - SLA monitoring

6. integrations

Purpose: Third-party system integrations (722+ integrations)

Integration Categories: - SIEM platforms (Splunk, QRadar, LogRhythm, etc.) - Threat intelligence (VirusTotal, AlienVault, etc.) - Ticketing systems (ServiceNow, Jira, etc.) - EDR/ Endpoint security (CrowdStrike, Carbon Black, etc.) - Cloud security (AWS Security Hub, Azure Sentinel, etc.) - Network security (Palo Alto, Cisco, Fortinet, etc.)

Integration Structure:

```
integrations/
├── zona_splunk/
├── zona_qradar/
├── zona_servicenow/
├── zona_virustotal/
└── ... (722+ integrations)
```

7. zonareact

Purpose: Frontend React application

Features: - User interface - Dashboard visualizations - Case management UI - Playbook designer - Custom widgets - Real-time updates

Technology: - React 18.2 - Redux for state management - Material-UI components - Chart visualizations (Recharts, D3) - Markdown editor (Quill)

8. securaa_db

Purpose: Database schemas and migrations

Contents: - MongoDB initialization scripts - Schema definitions - Migration scripts - Seed data - Database versioning

9. securaa_pylib

Purpose: Python utility libraries

Components: - Custom Python utilities - Integration helpers - Data processing libraries

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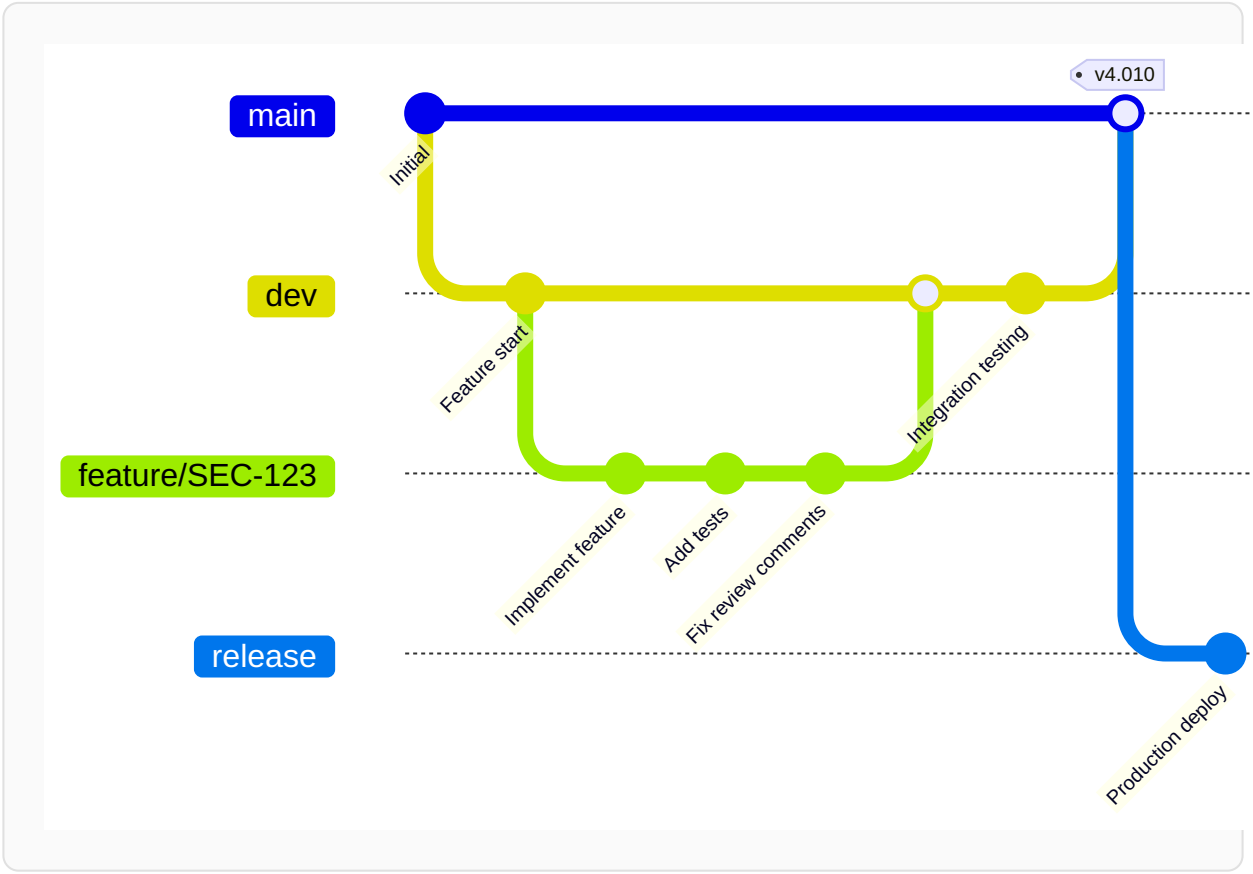
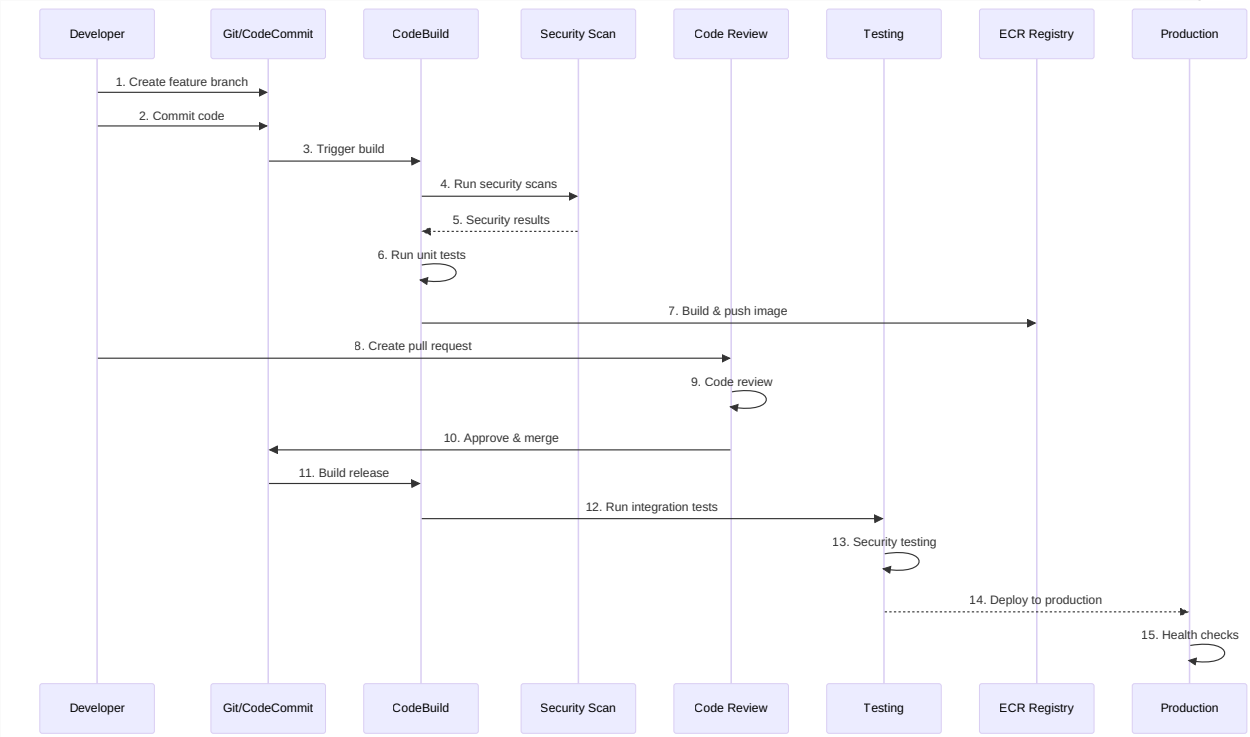
Development Workflow Overview

Git Branching Strategy



Branch Types: - `main` - Production-ready code - `release` - Release candidates - `dev` - Development integration branch - `feature/*` - Feature development - `bugfix/*` - Bug fixes - `hotfix/*` - Production hotfixes

Development Process Flow



Security Gates

Each phase of the SDLC includes mandatory security gates that must be passed before proceeding:

Phase Security Gates

Phase	Security Gate	Tools	Pass Criteria
Requirements	Security requirements defined	Threat modeling	All security requirements documented
Design	Security architecture review	Manual review	Architecture approved by security team
Development	Code security scan	GoSec, ESLint	No critical/high vulnerabilities
Development	Dependency scan	Nancy, npm audit	No known vulnerabilities

Phase	Security Gate	Tools	Pass Criteria
Testing	SAST scan	GoSec, Bandit	Security issues addressed
Testing	DAST scan	OWASP ZAP	No high-risk findings
Build	Container scan	Docker scan, Trivy	No critical vulnerabilities in images
Build	Compliance check	Custom scripts	Passes compliance requirements
Deployment	Security approval	Manual	Security team sign-off
Production	Security monitoring	CloudWatch, SIEM	Monitoring active and alerting

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Compliance Alignment

Our SDLC is designed to support compliance with major security and privacy frameworks:

SOC 2 Type II Alignment

Trust Service Criteria	SDLC Implementation
CC6.1 - Logical Access Controls	IAM roles, branch protection, code review
CC6.6 - Encryption at Rest	Encrypted databases, S3 encryption
CC6.7 - Encryption in Transit	TLS/HTTPS enforcement
CC7.2 - Security Monitoring	CloudWatch, security logging, SIEM
CC8.1 - Change Management	Git workflow, pull requests, deployment approval

ISO 27001:2022 Alignment

Control	SDLC Implementation
A.8.1 - Inventory of Assets	Repository documentation, service registry
A.8.3 - Media Handling	Encrypted storage, access logging
A.14.2 - Security in Development	Secure SDLC, security testing
A.14.2.5 - Secure Development Principles	Secure coding standards, code review
A.18.1.3 - Protection of Records	Audit logging, log retention

GDPR Compliance

Requirement	SDLC Implementation
Data Protection by Design	Privacy requirements in design phase
Data Minimization	Data flow analysis, only collect necessary data
Security of Processing	Encryption, access controls, security testing
Data Breach Notification	Incident response, security monitoring

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Metrics & KPIs

We track key performance indicators to measure SDLC effectiveness:

Security Metrics

Metric	Target	Measurement Frequency
Critical vulnerabilities	0	Continuous
High vulnerabilities	< 5	Weekly

Metric	Target	Measurement Frequency
Mean time to remediation (Critical)	< 24 hours	Per incident
Mean time to remediation (High)	< 7 days	Per incident
Security test coverage	> 80%	Monthly
Failed security scans	< 5%	Per build
Dependency vulnerabilities	0 critical	Weekly

Development Metrics

Metric	Target	Measurement Frequency
Build success rate	> 95%	Daily
Code review completion time	< 48 hours	Per PR
Deployment frequency	Multiple per week	Weekly
Change failure rate	< 10%	Monthly
Mean time to recovery	< 1 hour	Per incident

Roles & Responsibilities

Development Team

Responsibilities: - Follow secure coding standards - Write security-focused unit tests - Participate in code reviews - Address security findings promptly - Complete security training

Security Team

Responsibilities: - Define security requirements - Conduct threat modeling - Review security architecture - Perform security testing - Approve production deployments - Respond to security incidents

DevOps Team

Responsibilities: - Maintain CI/CD pipeline - Manage AWS infrastructure - Configure security tools - Monitor system health - Automate security checks

QA Team

Responsibilities: - Execute security test cases - Perform DAST scanning - Validate security requirements - Document security issues - Verify remediation

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Document Navigation

This SDLC documentation is organized into multiple documents for easy navigation:

1. **01_SDLC_Overview.md** (This Document) - Executive summary and overview
2. **02_Requirements_Phase.md** - Security requirements and threat modeling
3. **03_Design_Phase.md** - Secure architecture and design review
4. **04_Development_Phase.md** - Coding standards, Git workflow, code review
5. **05_Testing_Phase.md** - Security testing, SAST, DAST, penetration testing
6. **06_Build_Deployment_Phase.md** - AWS CodeBuild, ECR, IAM, deployment
7. **07_Operations_Monitoring.md** - Production operations and security monitoring
8. **08_CI_CD_Security_Pipeline.md** - Automated security in CI/CD

Version History

Version	Date	Author	Changes
1.0	October 2024	Security Team	Initial SDLC documentation
2.0	November 13, 2025	Security & Engineering	Comprehensive update with AWS infrastructure

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Contact Information

Document Owner: Engineering & Security Leadership
Security Team: security@securaa.com
Engineering Team: engineering@securaa.com

For Questions or Feedback: - Slack: #security-sdlc - Email: sdlc-feedback@securaa.com

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This document is confidential and intended for customer-facing purposes to demonstrate SECURAA's commitment to secure software development practices.