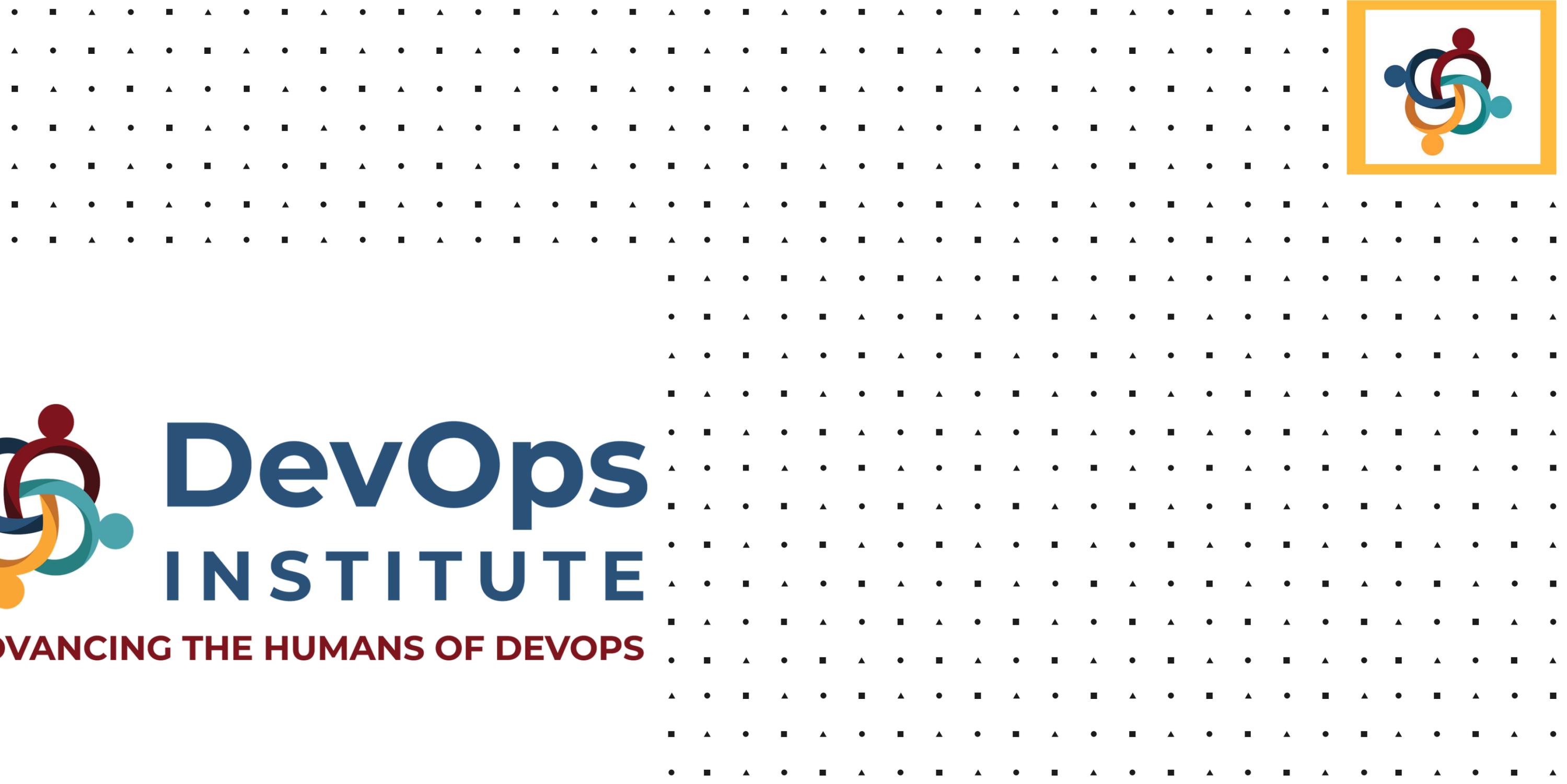
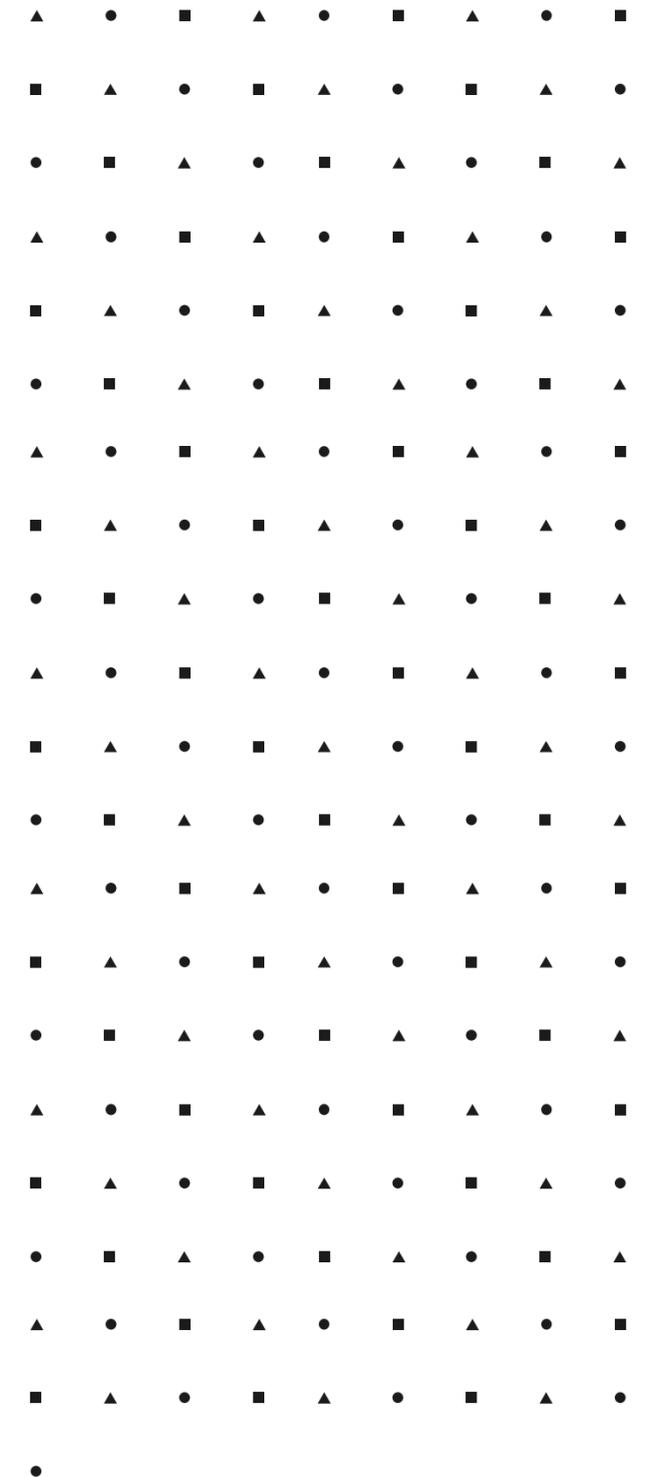




DevOps INSTITUTE

ADVANCING THE HUMANS OF DEVOPS







DevOps Foundation®

BLUEPRINT

With DevOps, people across the IT organization, working together, enable fast flow, feedback and continuous improvement of planned work into production, while achieving quality, stability, reliability, availability, security and team satisfaction.

CALMS Values

C: Culture - emphasizes shared vision collaboration, communication, learning and continuous improvement.

A: Automation - CI/CD toolchains, and infrastructure-as-code enable automation, consistency, velocity and fast recovery.

L: Lean - Maximize customer value while minimizing waste and improving flow.

M: Measurement - Value-driven metrics for people, process and technology support trust and performance improvement.

S: Sharing - Leaders and teams share ideas, and skills, improve communication, collaboration and performance.

The Three Ways

1st Way: Continuous Flow

2nd Way: Feedback

3rd Way: Continuous Improvement
(Experimenting and Learning)

Organization

Cross-function teams focus on business goals. Ops work with Dev, supporting each other to improve flow towards production and monitor results.



Benefits

Improved release cadence, velocity, throughput, efficiency and stability, quality, security and team satisfaction.

Principles & Practices

Frequent small releases using continuous integration, testing, delivery, deployments and monitoring reduce lead time, costs and risks.

Related Frameworks

Agile: Lean Development

ITSM: Processes

Lean: Reduce Waste

Value Stream Management: End-to-End



Site Reliability Engineering (SRE) FoundationSM BLUEPRINT

Site Reliability Engineering (SRE) is a discipline and a role that incorporates aspects of software engineering and applies them to infrastructure and operations problems to create ultra scalable and highly reliable distributed software systems.

Culture

Reliability @ Scale, Shift-Left "Wisdom of Production", and Continuous Improvement

Toil Reduction

Reduce Non-Value Add Work using Tooling and Automation

SLAs/SLOs/SLIs

Metrics such as Availability, Latency, and Response Time with Error Budgets

Measurements

Observability, Monitoring, Telemetry, and Instrumentation

Anti-Fragility

Improve Resilience using Fire Drills, Chaos Monkey, Security and Automation

Plan

Continuous Integration (CI)

Backlog & Design

Code & Test

Commit & Merge

Build & Test

Pipeline

Artifacts

Continuous Delivery / Deployment (CD)

SAT & UAT

Approve Release

Deploy to Prod

Post-Prod Tests

Operate

Work Sharing

Work Technical Debt in Small Increments
Manage Load % for Ops, Dev and On-Call Work

Deployments

Gradual Releases using Green/Blue, A/B, Canary Deployments, Automation Scripts, Testing and Monitoring

Performance Management

Monitoring, APM, Capacity Testing & Auto-Scaling

Incident Management

Emergency Response, 50% Ops/Dev Load, 25% On-Call Load, and Blameless Retrospectives



DevOps Leader®

BLUEPRINT

People that lead teams and organizations that are on a DevOps journey sponsor development of generative culture, support their teams and inspire actions to continuously transform their teams to higher levels of organization performance.

Transformational Leadership

Project a vision, provide intellectual stimulation, inspire collaborative communication, support specific behaviors and pro-actively recognize personal behaviors.

Unlearning Behaviors

Fearlessly let go outdated information, work without bias to enthusiastically take in new information that improves effective decision-making and improve flow of work

Models and Organization Designs

Design the organization aligned with the vision and improve communication between cross-functional teams using concepts from Target Operating Models, Conway's Law, SAFe, and Spotify.

Becoming a DevOps Organization

Engage early adopters in small cross-functional teams with shared goals to improve flow of their value streams using small batch sizes, tools and incremental processes.

Articulate and Socialize Vision

Passionately champion a vision with support from top management. Relentlessly promote changes across the organization incrementally to effect changes.

Measure to Learn

Employ value-stream mapping to visualize flow, determine metrics and current state of value-added tasks and waste to guide improvements.

Energy and Momentum

Evangelize measurable business outcomes gained with the improved value stream while honestly contrasting prior performance.

Measure to Improve

Use metrics and future state value stream mapping to identify improvement opportunities in People, Process and Tools.

Benefits

Well-led DevOps teams achieve more frequent, secure, quality code deployments, faster lead time from commit to deploy, faster MTTR, lower change failure rates, and team satisfaction.





DevSecOps Foundation (DSOF)SM

BLUEPRINT

Integrating security practices into DevOps, such as Security as Code, is a way for security practitioners to operate and contribute value with less friction. Security practices must adapt dynamically to ensure data security and privacy issues are not left behind in the fast-paced world of DevOps.

Cyber Threat Landscape (CTL)

Tactics, techniques and procedures (TTPs) describe how threat agents orchestrate and manage attacks. Threat Models optimize security by identifying objectives and vulnerabilities such as OWASP top ten, before defining counter-measures. Continuous Delivery practices are engaged to realize continuous governance, risk management and compliance.

Responsive DevSecOps Model

Security is made continuously adaptive and auditable by breaking security silos, cultivating a symbiotic relationship between security and other business units. Security specific practices and integrated toolsets as code (such as security scans) enable automated security KPIs and observable security practices into the DevOps value stream.

DevSecOps Stakeholders

Gaps between traditional waterfall security cultures and fast-paced DevOps cultures, are removed by building collaboration and trust. Through improving credibility, reliability and empathy while reducing self-interest. Decisions are based on advice from everyone affected and people with expertise using systems thinking. Shared metrics assure adaptable governance using discipline, with automatin, transparency and accountability.

Realizing DevSecOps Outcomes

Security is built into the value stream efficiently with empowered development teams implementing features securely, shift-left security testing, tools for automated feedback. Culture improvements instead of policy enforcements ensure security and software engineers are continuously cross-skilling and collaborating.



Pipelines & Continuous Compliance

Security test and scanning tools are integrated into the CI/CD pipeline to finding known vulnerabilities (published CVEs) and common software weaknesses (CWEs). Repetitive security tasks are automated such as configurations, Fuzz testing and long running security tasks. Compliance as Code helps in automating compliance requirements to foster collaboration, repeatability, and continuous compliance.

DevSecOps Practices

Security is integrated into people, process, technology and governance practices. Continuous security practices for DevSecOps are implemented in onboarding processes for stakeholders. Security practices and outcomes are monitored and improved using data-driven decision making and response patterns. Lean and value stream thinking ensure that security does not cause waste, delays or constraints for flow.

Getting Started

Value Stream Mapping establishes where security activities and bottlenecks currently happen. Collaborative design of a target value state map addresses security requirements, communication and automation improvements. Scope of the design includes practices for Artifact Management, Risk Management, Identity Access Management, Secrets Management, Encryption, Governance, Risk and Compliance, Monitoring and Logging, Incident response and learning.

Learning Using Outcomes

Continuous DevSecOps learning programs are implemented to meet evolving security requirements for the organization and individuals using strategies such as lunch and learns, mentoring, professional education, employee learning plans, structured training classes, Dojos, retrospective learning, gamification, and DevOps Institute SKILup Days.



Continuous Testing FoundationSM

BLUEPRINT

Testing, an essential portion of DevOps, is responsible for continuous assessment of incremental changes and is part of establishing a culture and environment where building, testing, and releasing software can happen rapidly, frequently, reliably and safely.

CT Concepts

All types of tests, that are mostly automated executed in production-equivalent test environments, assess the results of each stage in the end-to-end pipeline to determine if the artifacts are acceptable or need remediation before promotion.

Test Frameworks and Tools

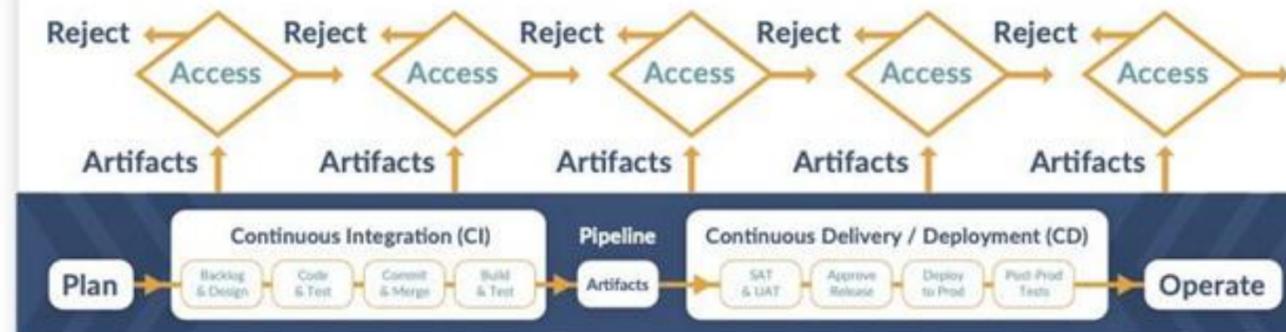
A test framework acts as a "backbone" for integrating and automating tasks including test plans, all types of test tools, test artifact version management, test resources, test data, tests, test schedules, test environment orchestration, test execution, test results, test reports, and test results analysis.

Test Planning

Test Strategies describe test requirements, management policies, resources, topologies, automation goals and coverage methodology and assumptions for a product or service. Test Plans define test cases and priorities for each product module to meet test strategy requirements.

Test Engineering Culture

Quality is everyone's responsibility. Leaders sponsor, inspire, fund, and motivate cross-functional teams to collaborate, learn, implement, and improve continuous testing practices.



CT Tenets: Shift-Left, Fail Early, Fail Often, Test Fast, Relevance

Test Automation

Automated tests are created per requirements described in test strategies and plans, using a test automation creation strategy such as TDD. Test and test tools are automated, orchestrated, operated and results analyzed through an API by test cases scheduled by a framework.

Test Strategies

Automate and trigger tests at each pipeline stage, orchestrate production-equivalent test environments, shift-left and accelerate testing as early as possible to find customer-relevant verdicts fast and early. Use A/B, Blue-Green and Canary strategies to validate user alternatives.

Benefits

Reduced time to market, improved quality, reduced cost, improved innovation, team satisfaction.

Test Management and Analysis

Manage resources (\$, labor, schedules and flexible scaling) to meet specific CT quality, delivery and response time goals that are determined by key stakeholders.



DevOps
INSTITUTE

Continuous Delivery Ecosystem FoundationSM

BLUEPRINT

Continuous Delivery (CD) is a software engineering approach in which teams produce incremental software changes in short cycles ensuring that the software can be released safely at any time. A DevOps toolchain automates a continuous delivery pipeline to deliver software changes faster, more frequently, securely, with reduced cost and risk.

Continuous Delivery Concepts

Collaborative management, design practices, continuous integration, continuous testing, infrastructures, toolchains, security, monitoring and delivery / deployment practices, work on incremental changes frequently using automation and fast feedback loops.

Collaborative Culture

Align cross-functional lean, agile teams around business goals. Embrace "The Three Ways of DevOps". Master collaboration, affinity, effective tooling and organization changes that support increasing scale with quality built-in.

Design Practices for CD

High performance CD ecosystems use loosely coupled API-based modular service-oriented architectures (e.g. microservices) and 12-Factor Apps design practices, enable apps to be separately packaged, processed, tested and delivered in separate images or containers.

Continuous Integration and Testing

Code changes are committed frequently to a version managed trunk branch. Images built from merged code are saved in an artifact repository. Tests conducted throughout the pipeline catch risky failures before release while completing tests quickly to avoid bottlenecks.

Security Assurance (DevSecOps)

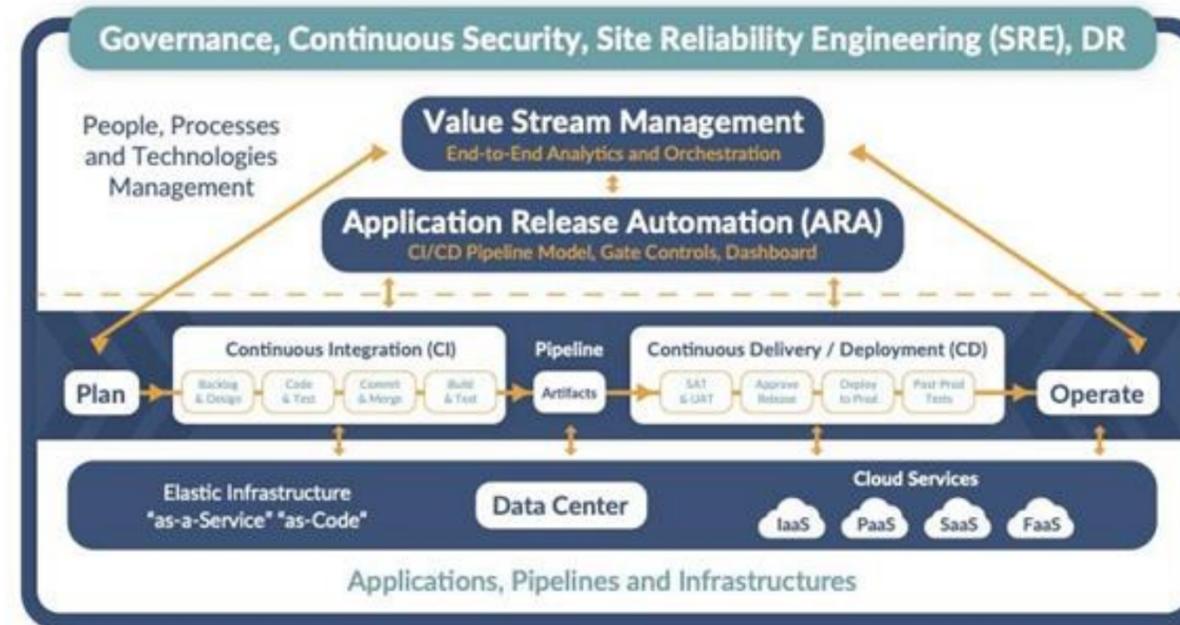
Vulnerabilities are identified and fixed as a part of the pipeline by integrating security practices into team activities, processes and tool chains, including automated security scans and monitoring of code, images and deployments.

Monitoring & Improvement

Real-time active monitoring and analytics make tests, processes, and application performance measures visible for real-time decision analytics at each stage of the pipeline to prevent bottlenecks and to identify improvements.

Continuous Delivery & Deployment

Automated configuration management, release automation, modular packages deployed using orchestrated virtualized, containerized, applications enable deployable production-ready artifacts and deployed safely using strategies such as Blue/Green, Feature Flag and Canary.



Infrastructure & Toolchains

Resilient, elastic infrastructures, such as virtual and cloud-based systems defined "as-code" and "as-a-service" support on-demand, auto-scalable, immutable deployment environments. Tests such as Chaos Monkey identify failure points for improving reliability of infrastructure and toolchains.

SKILbooks

SKILbooks are a collaborative body of knowledge comprising research and artifacts to help one understand and SKILup DevOps capabilities.

A SKILbook is populated with multiple research chapter reports plus additional content for ongoing discovery and support during your DevOps journey.

We continuously update the playbook with regional and global perspectives for actionable strategies and implementations.

Explore
&
Discover

Vision

Success

Landscapes

Understand
&
Learn

Frameworks

Principles

Core Practices

Plan/Practice
&
Do

Culture

Process &
Functions

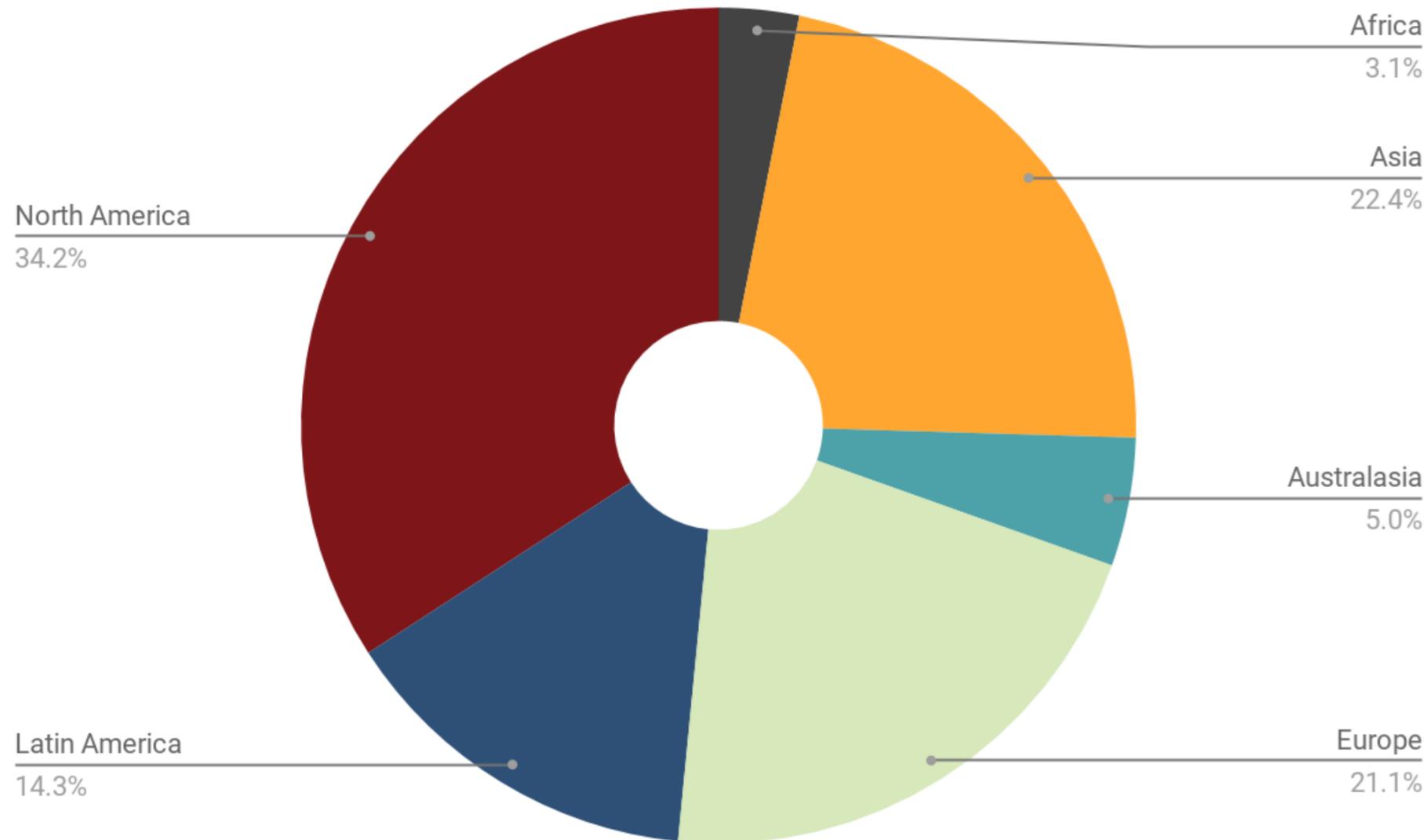
Automation

Optimize
&
Improve

Performance

Visual Library

Over 160
Global
Ambassadors



Research

Global UpSkilling DevOps Skills Survey/Report

UPSKILLING
2020

Enterprise DevOps
Skills Report

DevOps Institute

SKILup

DAYS



SKILup Days

One day virtual Micro Conferences with a singular focus that place specific topics under the microscope.

Focused entirely on the 'How To'

Monthly Topics

April 30	Value Stream Management
May 21	Enterprise Kubernetes
June 18	SRE
July 16	Release Automation
August 20	Hybrid Cloud
September 17	Human Skills
October 15	CI/CD
November 12	Continuous Testing
December 10	Global SKILup Day



GLOBAL
SKILupSM
FEST
by DevOps Institute

Annual Week of Continuous Learning
Week of December 7

Career Fair

December 7

Pre-Conference Training

December 8 & 9

Global SKILup Day

December 10

