
AWS
re:Invent
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DOP201

AWS infrastructure as code: A year in review

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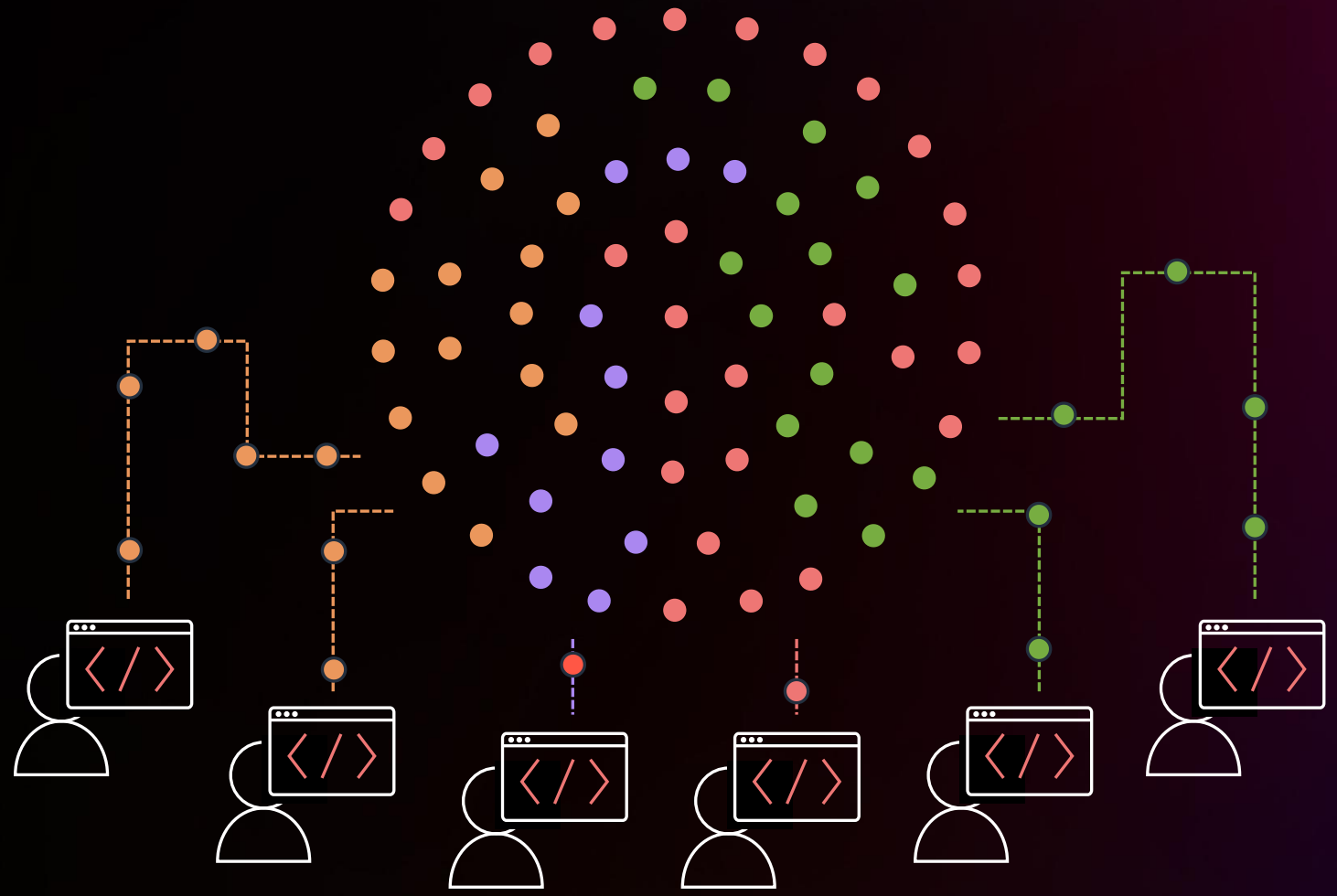
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Agenda

- AWS infrastructure-as-code portfolio
- Building on a resource foundation
- Evolving organizations and personas
- Shift left with policy as code
- Wrap up

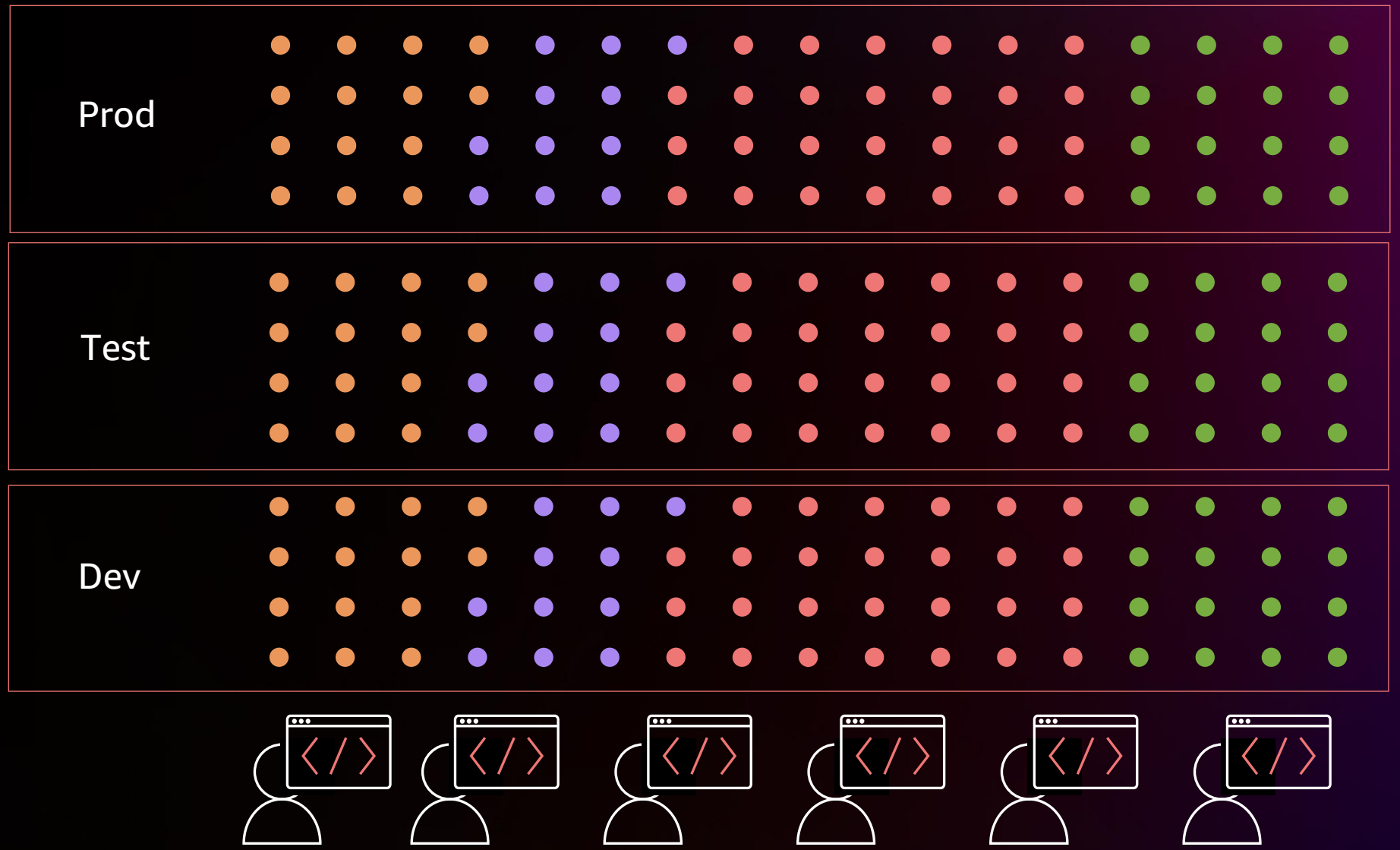
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What is infrastructure as code?



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What is infrastructure as code?



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How customers use AWS infrastructure as code

AWS IaC

Different authoring languages to meet customer choice to describe infrastructure

Automates provisions infrastructure as described in the template

Makes it easy to scale infrastructure

Tooling and integrations for enterprise requirements around compliance, governance, automation, and security

Manage AWS and third-party resources together

Over a million active customers manage application resources with AWS CloudFormation every week

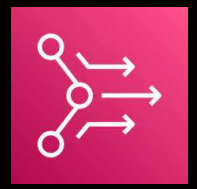


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AWS IaC portfolio at a glance

Platform operations and deployment



AWS Proton



AWS Amplify



AWS Service Catalog

HashiCorp Terraform

Pulumi

Red Hat Ansible Automation Platform



AWS CDK & AWS SAM



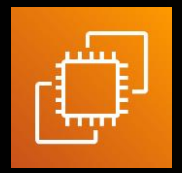
AWS CloudFormation



AWS Cloud Control API



AWS CloudFormation resource registry



Amazon EC2



AWS Transit Gateway



Amazon S3



Amazon Kinesis



Amazon Kendra



Hundreds of AWS and third-party resources

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Building on the resource foundation



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Importance of a resource foundation

- All IaC tools start with resource coverage as the foundation
- Customers can't use AWS services if they are not supported in their IaC tools
- We strive to solve resource coverage for the industry, not just AWS IaC tools

AWS continues to innovate rapidly on behalf of its customers

200+ fully featured services

3,084 significant new features in 2021

"Without CloudFormation support for AWS features or services, we are unable to use those AWS innovations as part of our cloud infrastructure."

– Enterprise CIO

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AWS IaC coverage update

JOURNEY TO STANDARDIZATION

What does a standard resource model mean?

- Consistent experience across features such as Resource Import and Drift Detection
- Opportunities for new features that require consistent read/list handlers
- Auto-generation of resource coverage in AWS CDK and AWS Partner tools
- AWS Cloud Control API: common set of control plane verbs

"A dream doesn't become reality through magic; it takes sweat, determination, and hard work."

– Colin Powell

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AWS Cloud Control API

Registry resource model: standard specification for developing a resource; each resource is defined by a schema and create/read/update/delete/list (CRUDL) handlers

CCAPI takes advantage of a standard resource specification to offer a common set of CRUDL APIs for all supported resources



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AWS Cloud Control API Partners

Partners have integrated with CCAPI to automate their resource coverage

Author once, support everywhere

HashiCorp Terraform

Pulumi

Red Hat Ansible Automation Platform

AWS Cloud Control API

AWS CloudFormation resource registry

Amazon EC2

AWS Transit Gateway

Amazon S3

Amazon Kinesis

Amazon Kendra

Hundreds of AWS and third-party resources

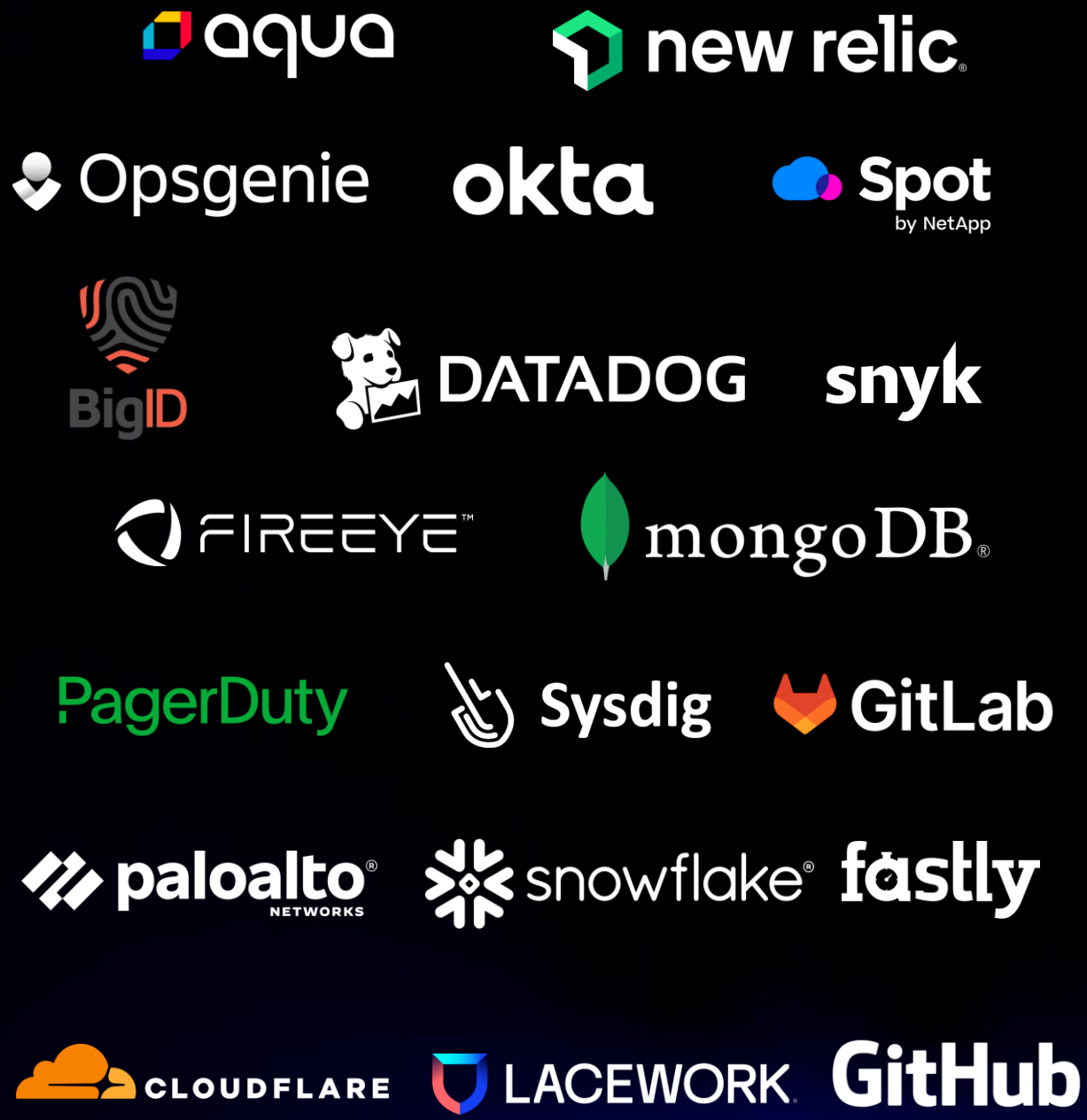
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New coverage updates

NEW! AWS CloudFormation now supports resources for AWS Organizations

The CloudFormation registry exposes a standard specification that is open to non-AWS solutions

NEW! AWS CloudFormation now supports 50 new resources across popular AWS Partner solutions



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Organizational trends in IaC

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Platform engineering is emerging to drive value

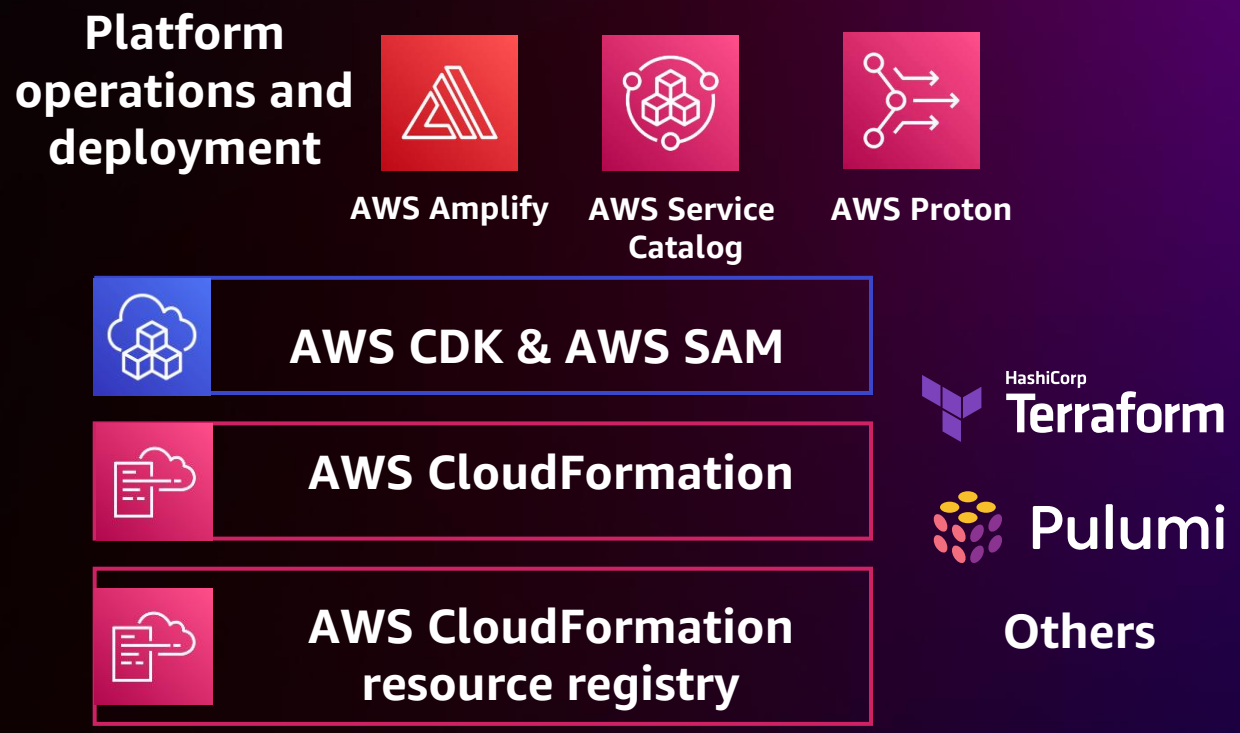
Customers are adopting platform engineering functions to expose best practices and ease consumption

Developers own application definition, and increasingly influence infrastructure definitions

Serverless architectures often involve infra and application deployments in one

Customers are looking for solutions that align to their workforce and architectures

Targeted solutions, built on top of AWS CloudFormation, have been introduced to meet the needs of different personas



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What is GitOps?

> **GitOps** is an approach where infrastructure is defined as code (IaC) alongside application code, versioned in a git repository, and then provisioned following the same merge request process as application software code

Infrastructure as code
hosted just like software code

+

Git
versioning and pull requests workflows

+

CI/CD
for automated build, test, and deploy

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GitOps

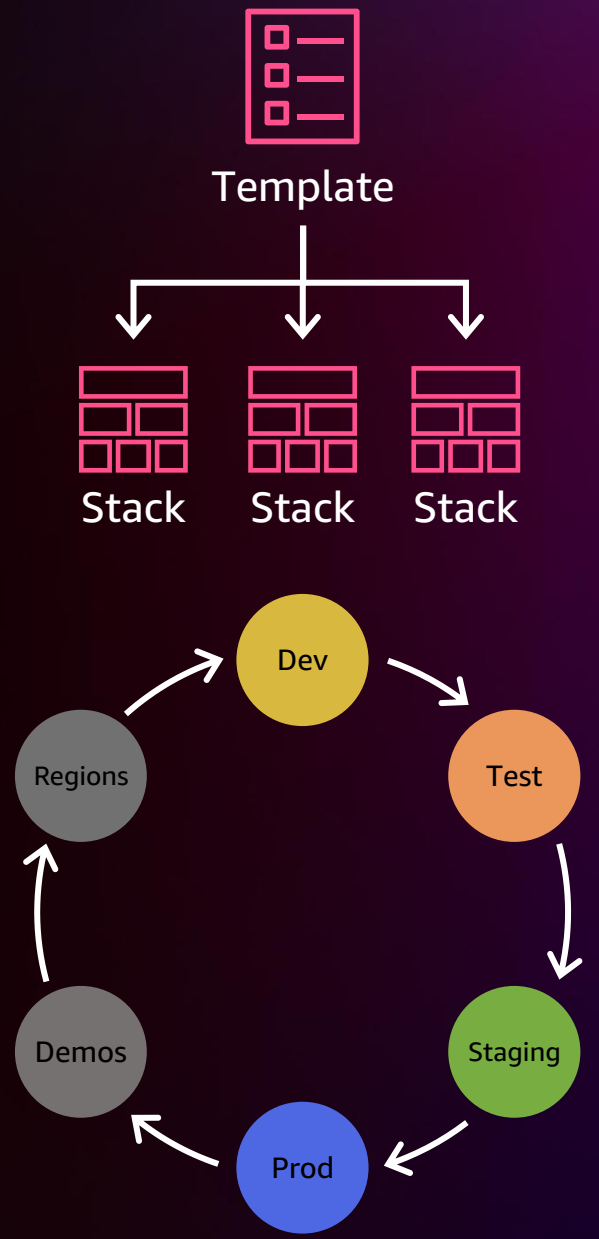
Single source of truth to deploy the whole stack

A single workflow to control versioning on your infrastructure

Service rolls back to the last good state on failures

Infrastructure is defined, built, and run through CI/CD

Drift detection



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Bringing DevOps practices to infrastructure

Teams with higher-evolved DevOps practices:

Change management effectiveness

3x more effective

Restore service after incident in less than a day

77% of teams

Remediate vulnerability in less than a day

60% of teams

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Empowering app developers to influence infra



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Organizations evolving IaC operations

- Platform engineering function
- GitOps
- DevOps
- Developer empowerment

- Business agility
- Productivity
- Cost savings

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Meeting the needs of all personas

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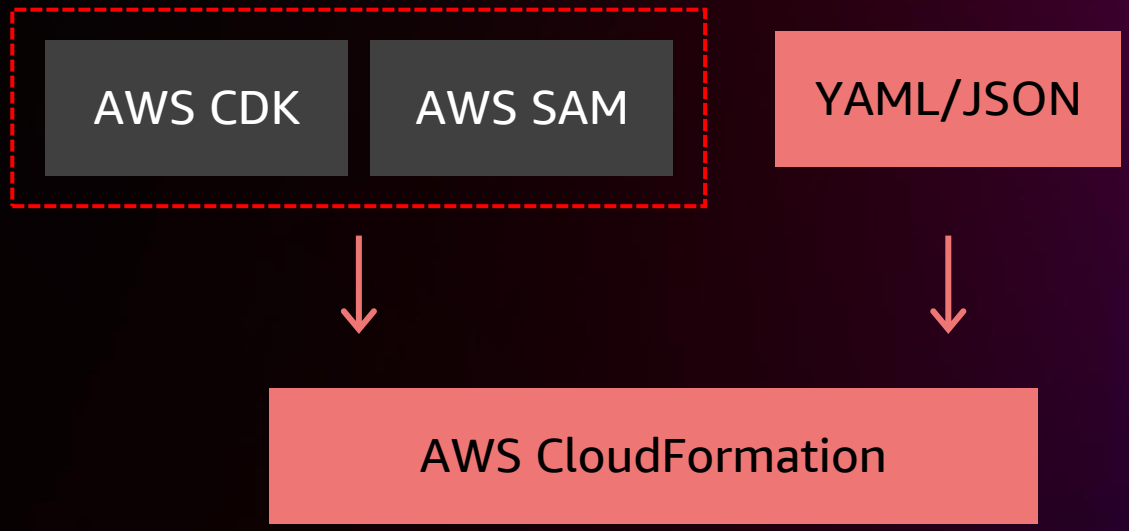
Right set of tools for your organization

AWS CDK AND AWS SAM COMPILE TO AWS CLOUDFORMATION

Model infrastructure

Provision and delete infrastructure

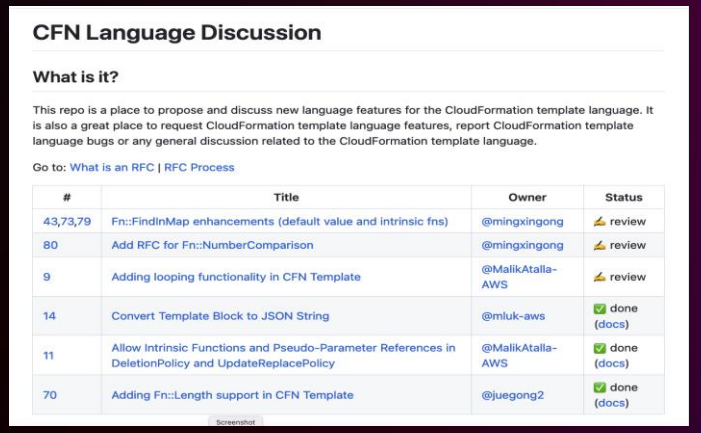
Manages state, dependencies



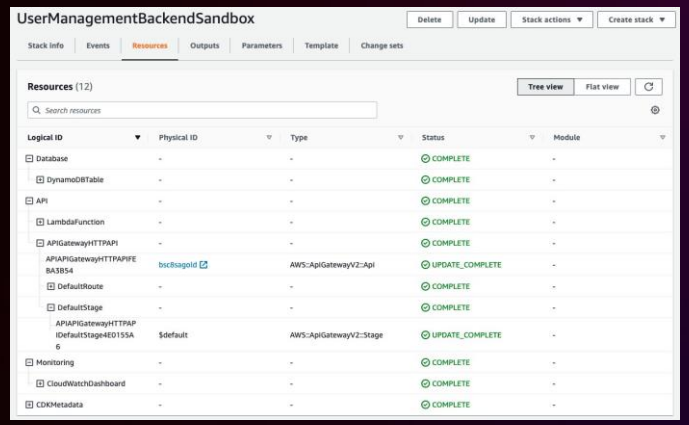
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IaC launches serve all personas

CloudFormation Open Language Discussion Transform



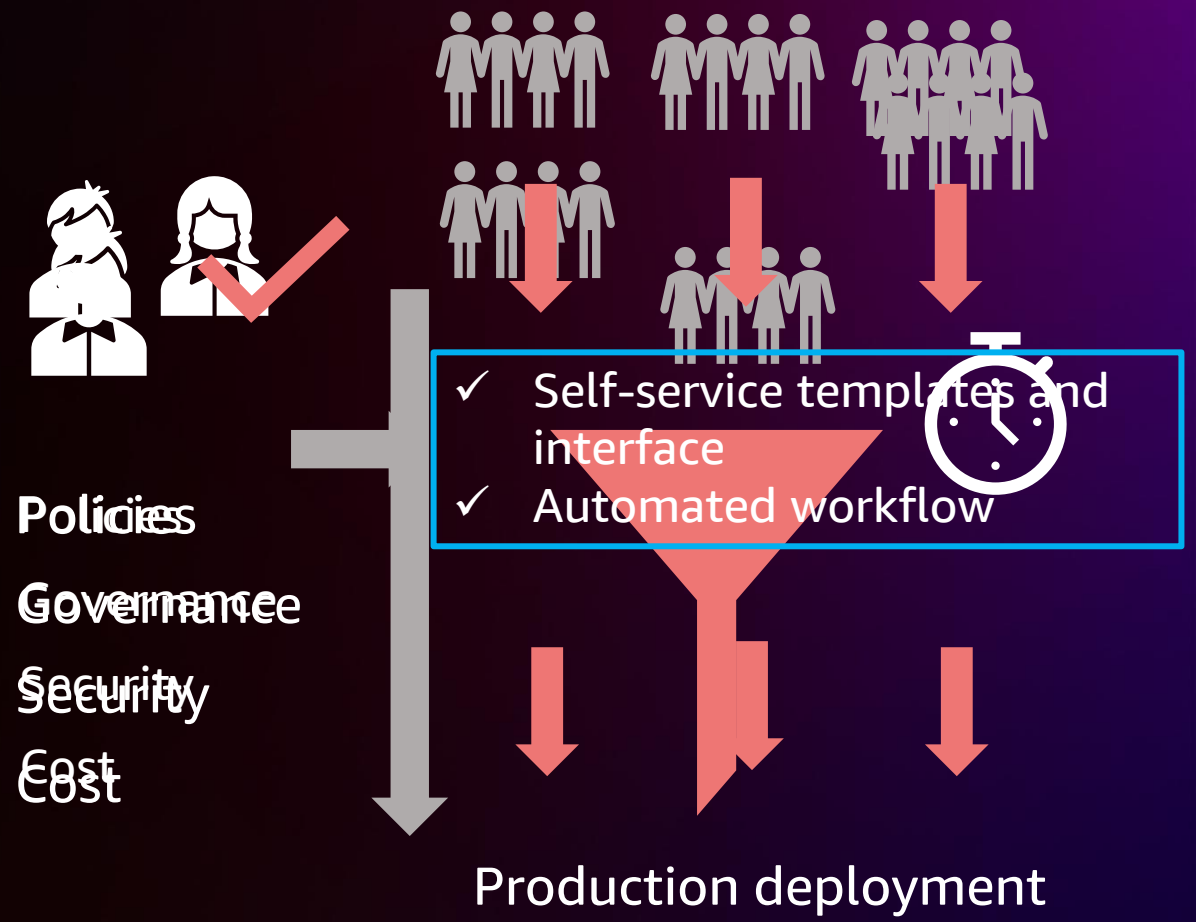
AWS CDK Construct Tree View in CloudFormation Console



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Internal developer platforms enable DevOps best practices

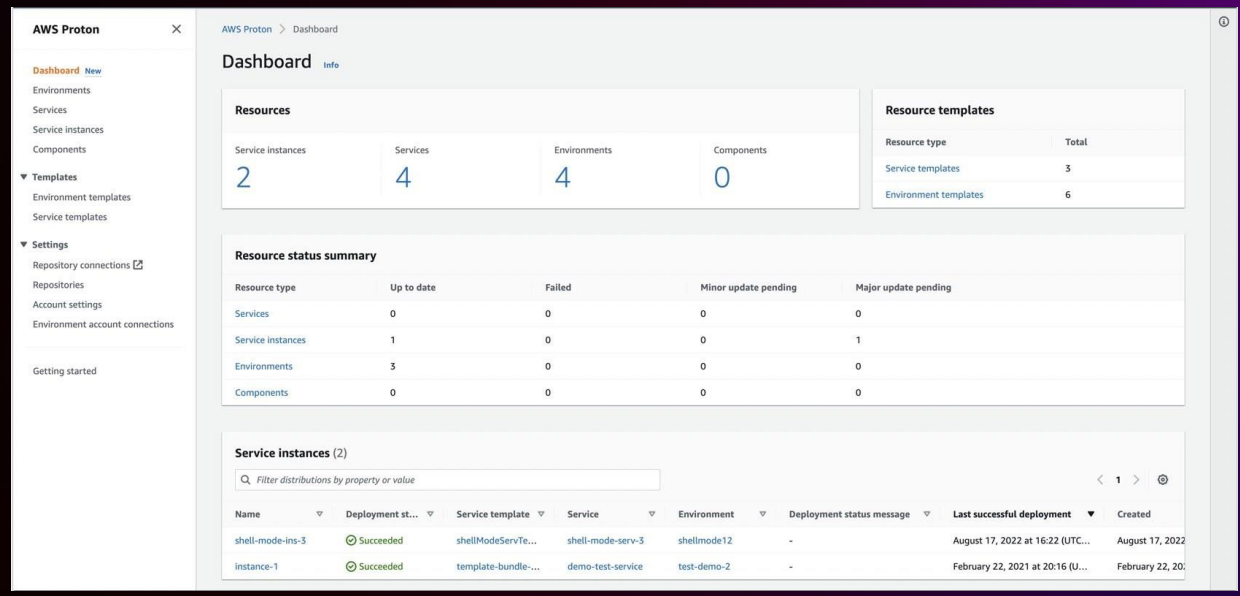
- Move from manual review to self-service
- Integrate automation and “golden path” best practices
- Centralize preferred templates for consistency, visibility, cost control
- Infrastructure is defined, built, and run through CI/CD by default
- Delight developers with the right abstractions



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Managed service support for best practices

- Platform engineering
  - Meet customers with the right tooling integration for IaC
  - AWS Proton support for CloudFormation, Terraform, CDK, TF-CDK, Pulumi . . . any preferred IaC tool
- GitOps + DevOps
  - Git-based management with TemplateSync
- Developer empowerment
  - Developer-defined infrastructure with Components



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Right level of abstraction for your team



"AWS is my platform engineer"



AWS Amplify

Platform operations and deployment



AWS Service Catalog



AWS Proton



AWS CDK & AWS SAM



AWS CloudFormation



AWS CloudFormation resource registry





Others

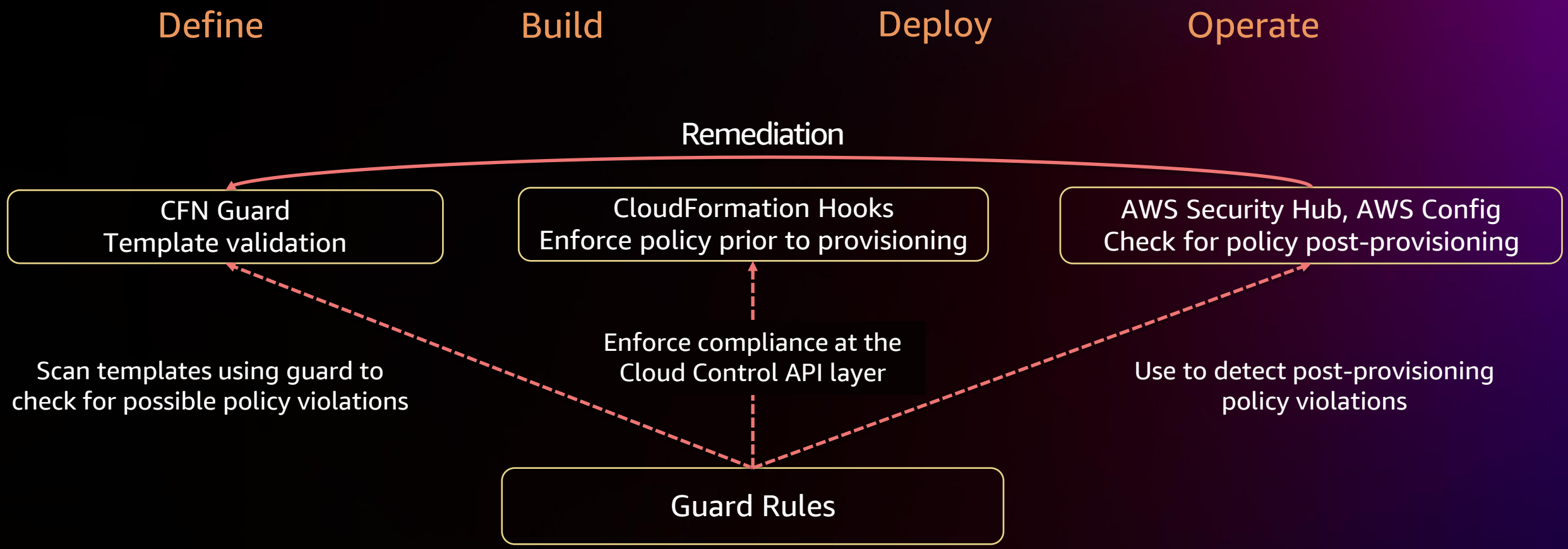
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IaC is a key point for preventative governance

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Consistent policy definition enforced across lifecycle

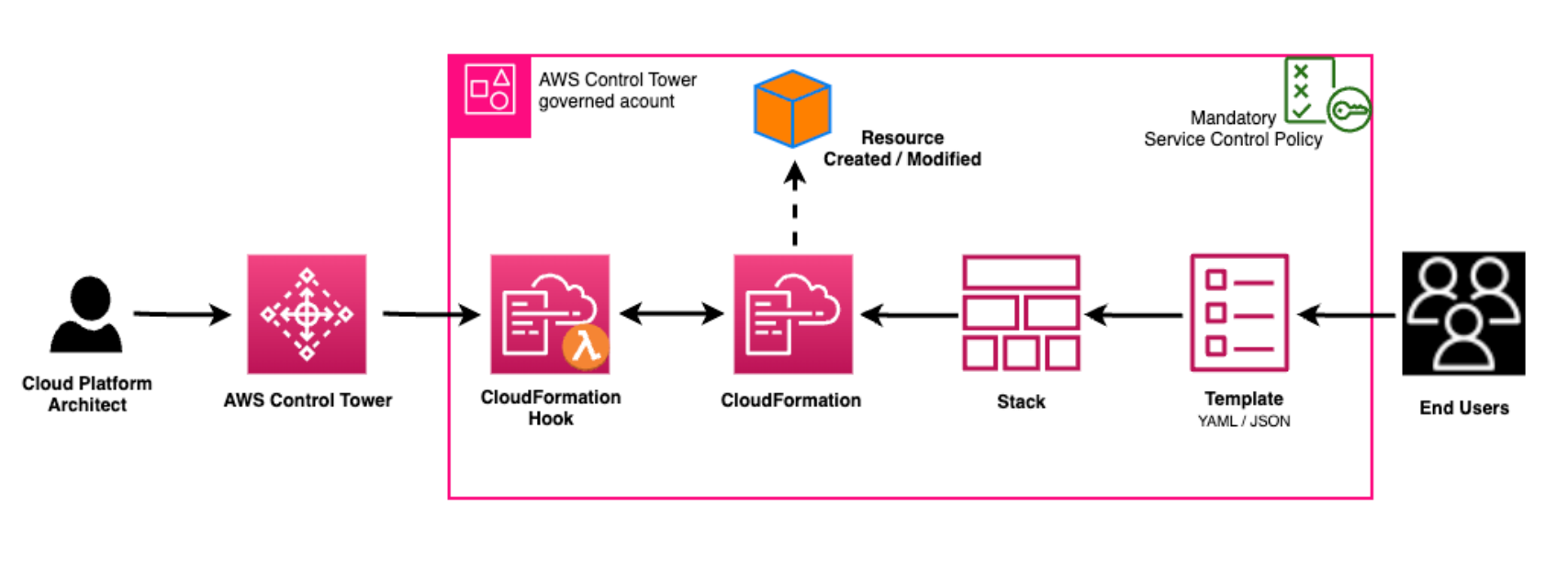


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Opinionated purpose-built controls for 28 AWS services (preview)

COMPREHENSIVE CONTROLS MANAGEMENT WITH AWS CONTROL TOWER

- **NEW! Proactive controls (CloudFormation Hooks + CFN Guard)**
  - Proactively identifies noncompliant resources before they are provisioned by AWS CloudFormation
  - Policies are automatically enforced on all AWS CloudFormation deployments



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AWS IaC year ahead

- Coverage, coverage, coverage – support Day 1 service launch, migrate resources to registry resource model; expose resource layer via AWS Cloud Control API
- Performance – more and more internal and external solutions rely on AWS IaC for provisioning; we are focusing on the provisioning speed for abstractions
- CDK enterprise adoption – deliver new innovation to help enterprises adopt CDK
- Deployment visibility – ensure customers have visibility into changes and can quickly recover from unintended changes

"Your future is whatever you make it, so make it a good one."
– Dr. Emmet Brown (Back to the Future)

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Thank you!

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