Pulumi

AWS & Pulumi: Better Together for AI-Powered Infrastructure

Platform Engineering Excellence Through AWS and Pulumi Integrations

In collaboration with

Platform Engineering Challenges & the AWS and Pulumi Solution

Organizations deploying AWS services face team silos between developers, infrastructure, and security. This fragmentation creates complex deployments, inefficient spend, and compliance risks across hundreds of AWS services.

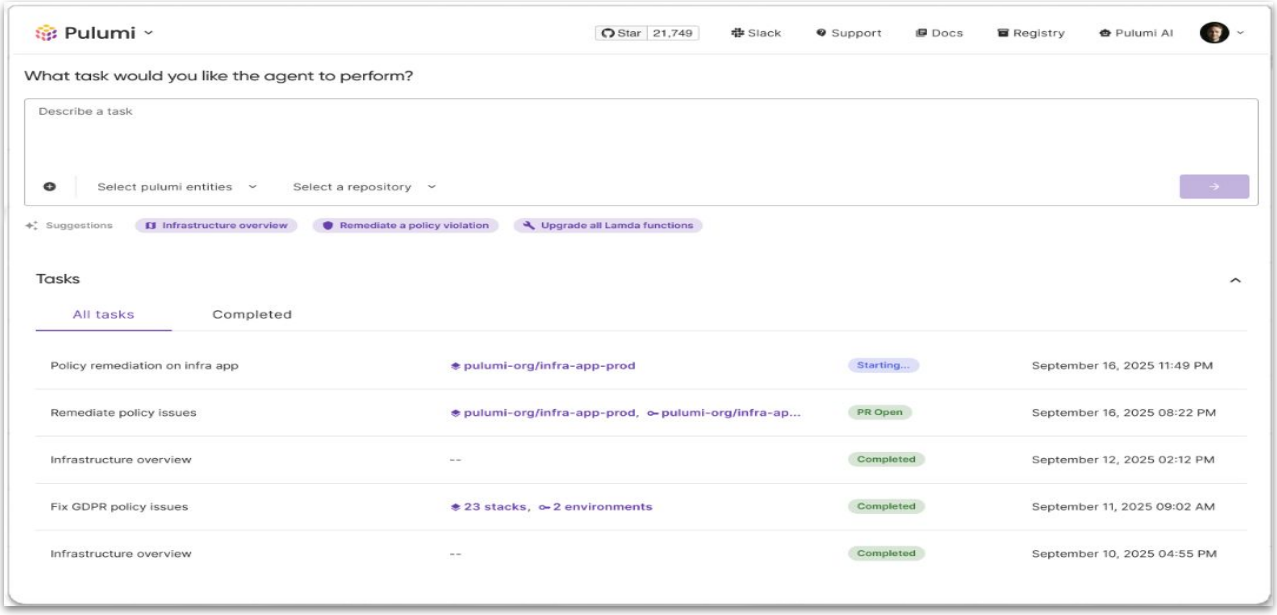
Platform engineering with Pulumi and AWS

Pulumi's unified platform addresses this with four integrated capabilities: Infrastructure as Code for AWS provisioning, ESC for secrets management, Internal Developer Platform for self-service, and Insights for cost analytics. This integrated approach eliminates team silos while maintaining governance.

This platform integrates deeply with AWS:

- **Infrastructure as Code:** Native support for 200+ AWS services (EKS, Lambda, Bedrock, RDS, Control Tower) with reusable components and templates
- **ESC:** Centralized secrets management connecting to AWS Secrets Manager and IAM through OIDC for dynamic credentials
- **Internal Developer Platform:** Self-service provisioning with policy as code enforcement and compliance monitoring
- **Insights:** Cost analytics, resource discovery, and drift detection across AWS accounts with auto-remediation

The platform is enhanced with Pulumi Neo AI assistant, built on Amazon Bedrock, providing intelligent automation across all four capabilities while maintaining enterprise governance.



Pulumi makes it easy to adopt platform engineering practices within any organization and simplifies cloud management in three key ways:

Accelerate cloud delivery

- Integrated Infrastructure as Code(IaC) + Internal Developer Platform (IDP) enables self-service AWS provisioning. Engineers create reusable components and templates while IDP provides developer self-service interfaces for rapid deployment of compliant workloads.
- IaC uses familiar languages (Python, TypeScript, Go, C#) for AWS resource management. Teams leverage CDK constructs within Pulumi programs, combining native AWS constructs with universal infrastructure code.
- Platform integrates with CI/CD pipelines and workflow authoring for automated deployments and scaling.

Strengthen security and governance

- Integrated ESC + Policy Engine provides comprehensive AWS security. ESC delivers dynamic credentials through AWS Secrets Manager and IAM OIDC integration. Policy as code enforces compliance rules while supporting AWS Control Tower multi-account governance with landing zones and guardrails.
- Automated compliance monitoring across AWS services ensures all deployed resources meet security standards through identity-based policy enforcement integrated with AWS IAM.
- Audit logs and role-based access controls ensure comprehensive tracking and governance across AWS services.

Boost productivity and cost-efficiency

- Integrated Insights + Cost Analytics provides unified visibility across all AWS resources and accounts.
- Teams identify unused resources, optimize spend, and track usage across accounts. Reusable templates and components minimize waste while ensuring consistency.
- Platform customers report 50% less maintenance time, 80% faster deployments, and 10x development velocity. Automated workflows maintain compliance with zero downtime upgrades and continuous monitoring.

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AWS & Pulumi: Reference Architecture in Action

Teams use Pulumi for complete infrastructure lifecycle management from provisioning and security through deployment automation and compliance monitoring.

1. PROVISION: Infrastructure as Real Code

Define complete architecture (EKS, Aurora, VPC peering, Transit Gateway, Lambda) in familiar languages with loops, conditionals, and strongly-typed properties. Provider 7.0 targets multiple regions from one instance. Pulumi manages dependency graphs: IAM roles before node groups, security groups before ENIs. State backend uses concurrent locking preventing corruption.

2. SECURE: OIDC Federation & Dynamic Secrets

ESC configures IAM OIDC identity providers with trust policies for environment-level access control. CI/CD pipelines exchange OIDC tokens for temporary credentials. ESC fetches secrets from Secrets Manager at runtime, injecting them as environment variables. Secrets never touch Git or CI/CD configs.

3. MONITOR: Resource Discovery & Drift Detection

Insights maintains unified resource index across accounts by scanning APIs. Discovery catalogs resources created outside Pulumi, correlating by ARN and tags. Drift detection compares API responses against state backend values, generating diffs for auto-remediation through pulumi up --refresh.

4. GOVERN: Self-Service with Policy Enforcement

Component resources encapsulate multiple resources under a single type. PlatformEksCluster bundles EKS cluster, IAM roles, launch templates, and VPC endpoints. Policy validation runs during preview, evaluating resource properties against rules before API calls, halting deployment on violations.

Unified platform eliminates toolchain fragmentation across provisioning, security, and compliance, enhanced with AI automation through Neo built on Bedrock.

Evolution of Cloud Management with AWS & Pulumi - AI Era

Infrastructure as code established programmability and automation. Pulumi's integrated platform evolved this with native AWS support, centralized secrets (ESC), and infrastructure visibility (Insights). Neo AI assistant, powered by Amazon Bedrock, now adds conversational interfaces across the entire platform.

Accelerate Innovation

Neo + Infrastructure as Code Integration: Generate infrastructure code conversationally for AWS services. Describe 'VPC with EKS cluster and RDS Aurora' and Neo produces type-safe Pulumi code with proper dependencies. Engineers review and approve while maintaining platform governance and compliance workflows.

Simplify Operations

Neo + Platform Orchestration: Coordinate complex AWS operations through conversation. 'Upgrade EKS clusters with zero downtime' or 'migrate workloads with dependency mapping' become simple requests that orchestrate across IaC, ESC, and policy enforcement. Operations require explicit human in the middle approval at each step, with full rollback capabilities and audit logging for enterprise compliance.

Enhance Security

Neo + ESC: Scan AWS infrastructure identifying misconfigurations while operating within ESC-managed credentials and IAM boundaries. Generate remediation code with impact analysis, maintaining the platform's security and governance model. Neo operates within existing IAM boundaries and organizational policies, generating remediation code that requires security team approval before implementation.

Automate Compliance

Neo + Insights Integration: Monitor AWS resources against declared state and compliance frameworks. When drift occurs, generate remediation code with rollback procedures, integrating with the platform's approval workflows and policy enforcement.

Proven Results: Customer Success

Pulumi has helped leading organizations to deliver remarkable outcomes

snowflake

Snowflake used Pulumi to migrate its platform from a VM-based architecture to a Kubernetes-based infrastructure, reducing deployment time from over a week to less than a day.

Reduced deployment time to **less than a day**

CLEAR

Clear transitioned its focus from providing low-level, friction-inducing tools to building a highly polished, easy-to-use internal developer platform, which ensures engineers are “not blocked on infrastructure” and can focus on solving business problems

Infrastructure unlocked, security compliance enforced automatically

modivcare

Modivcare used Pulumi to transform fragmented acquisition-built infrastructure into a unified platform without service disruption, achieving up to 25% cost reductions and enabling developer self-service.

25%
Cost Reduction

BMW used Pulumi to build a scalable and resilient hybrid cloud implementation that could handle more than eleven thousand developers.

Unified Solution For All Services

Transform Your AWS Infrastructure Today

AWS and Pulumi deliver unified platform engineering capabilities at scale. Native support for 200+ AWS services, ESC integration with Secrets Manager and IAM OIDC, and Insights visibility across Control Tower accounts. Enhanced with Neo AI assistant built on Amazon Bedrock for intelligent automation while maintaining governance.

Consider your current approach

- Are you spending more time managing AWS infrastructure than delivering value?
- Can developers self-serve AWS infrastructure without creating compliance issues?
- Do you enforce security seamlessly across AWS services?
- Are your platforms designed to scale across AWS accounts while maintaining governance?
- Could AI assistance accelerate your AWS infrastructure workflows?

Infrastructure as code established programmability and control. AWS and Pulumi evolved this with native service integration, centralized secrets, and infrastructure visibility. Conversational interfaces powered by Amazon Bedrock now deliver AI-assisted automation while maintaining governance and removing manual bottlenecks.

Experience Pulumi with Neo AI assistant and discover how AI can transform your infrastructure workflows. Book a demo or start your free trial today.

Request a demo

Start a free trial today

Pulumi