Argo CD

Argo CD is a declarative, GitOps-based continuous delivery tool designed for Kubernetes application deployment and management. It automates synchronization between a Git repository (the single source of truth for application definitions) and your Kubernetes clusters, ensuring that deployed applications always match the desired state specified in version-controlled manifests.

Key Features

- **Automated deployment**: Argo CD continuously monitors your applications, comparing their live state with Git-based target configurations and automatically deploying changes as needed.

- **Supports multiple templating tools**: Compatible with Kustomize, Helm, Jsonnet, and plain YAML, allowing flexible application manifest definitions.

- **Multi-cluster management**: Manage deployments across several Kubernetes clusters from a unified interface.

- **Web UI and CLI**: Provides a user-friendly web dashboard and command-line tools for real-time application activity monitoring and troubleshooting.

- **Role-based access control (RBAC)**: Supports multi-tenancy and detailed authorization policies for secure deployments.

How It Works

Argo CD runs as a Kubernetes controller, continuously checking the current live state of applications against the desired state defined in your Git repository. If there is a deviation (marked "OutOfSync"), it reports the differences and can automatically or manually sync the cluster to the desired state. Integrations are available for SSO (OIDC, OAuth2, LDAP, SAML, etc.), webhook events, and third-party CI systems.

Typical Use Cases

- Automating and securing Kubernetes application rollouts using Git as the single source of truth.

- Managing configuration drift detection and visualization for large or multi-cluster environments.

- Enabling audit trails and rollback features for robust and compliant software delivery workflows.

Argo CD is a core component of GitOps workflows, simplifying and standardizing Kubernetes deployments for teams focused on infrastructure-as-code, automation, and controlled change management.