Kubernetes Report

Introduction

This report provides an overview of the current state of Kubernetes as of 2025. It highlights key features, developments, and advancements in the ecosystem, including security, scalability, and performance improvements.

Kubernetes 1.24 Release

The latest stable release of Kubernetes, v1.24, was announced in March 2023 and has seen significant improvements in security, scalability, and performance. This release has addressed several critical issues and provides a more stable platform for users to deploy their applications.

Key Features:

- Improved cluster management
- Enhanced network policy enforcement
- Better support for persistent storage

Benefits:

- Increased stability and reliability
- Improved performance and scalability
- Simplified cluster operations

Cloud Native Computing Foundation (CNCF) Growth

As of 2025, the CNCF has over 500 member companies, including industry leaders like Google, Amazon, Microsoft, and IBM. This growth solidifies Kubernetes' position as a widely adopted standard for container orchestration.

Key Takeaways:

- Industry-wide adoption
- Increased community engagement
- More resources available for development and support

Kubernetes Network Policies

Introduced in v1.7, network policies have become a crucial feature for ensuring secure communication between pods within a cluster. As of 2025, network policy enforcement has been optimized for better performance and security.

Benefits:

- Improved security
- Simplified network configuration
- Better performance

Persistent Volumes (PVs) and StatefulSets

Kubernetes' support for PVs and StatefulSets has improved significantly, allowing for more efficient management of stateful applications and persistent storage.

Key Features:

- Persistent volume support
- StatefulSet management
- Improved application deployment

Benefits:

- Simplified application deployment
- Efficient resource utilization
- Better data integrity

Service Mesh Integration

Kubernetes supports the integration of service meshes like Istio, Linkerd, and Consul. This enables users to build robust, distributed systems with built-in observability and traffic management.

Key Features:

- Service mesh support
- Traffic management
- Observability

Benefits:

- Improved application performance
- Enhanced security
- Better monitoring and logging

Operator Framework

The Operator Framework has gained popularity as a means for packaging, deploying, and managing applications on Kubernetes. As of 2025, over 100 Operators are available in the CNCF registry.

Key Features:

- Operator development
- Application management
- Simplified deployment

Benefits:

- Improved application deployment
- Efficient resource utilization
- Better support for complex applications

Kubernetes Security Features

Kubernetes has introduced several security features, including network policies, pod security policies, and secret management. Additionally, tools like Gatekeeper and Open Policy Agent have been integrated to provide additional security capabilities.

Key Features:

- Network policy enforcement
- Pod security policies
- Secret management
- Additional security tools (Gatekeeper and Open Policy Agent)

Benefits:

- Improved security posture
- Simplified security configuration
- Better protection against threats

Multi-Cluster Management

With the introduction of the Multi-Cluster Kubernetes (MCK) project, users can now manage multiple clusters from a single control plane. This simplifies cluster operations and improves scalability.

Key Features:

- Multi-cluster management
- Simplified cluster operations
- Improved scalability

Benefits:

- Reduced operational complexity
- Improved resource utilization
- Better support for large-scale deployments

Cloud Provider Integrations

As of 2025, Kubernetes has official integrations with major cloud providers, including Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), and IBM Cloud. These integrations provide seamless deployment and management of Kubernetes clusters on public clouds.

Key Features:

- Cloud provider integrations
- Simplified deployment
- Improved scalability

Benefits:

- Reduced operational complexity
- Improved resource utilization
- Better support for large-scale deployments

Serverless Computing Support

Kubernetes now supports serverless computing through projects like Knative. This enables users to build event-driven applications without worrying about the underlying infrastructure.

Key Features:

- Serverless computing support
- Event-driven application development
- Simplified resource allocation

Benefits:

- Improved application performance
- Reduced operational complexity
- Better support for real-time applications