

EMCO Architecture & Design

- [Background](#)
- [Architecture Overview](#)
 - [Distributed Application Scheduler](#)
 - [Resource Synchronizer](#)
 - [Cluster Registration Controller](#)
 - [Network Configuration Management](#)
 - [Distributed Cloud Management](#)
 - [Status Monitoring](#)
 - [Placement Controllers](#)
 - [Action Controllers](#)
- [Getting Started - EMCO Installation](#)
- [EMCO Operations](#)

Background

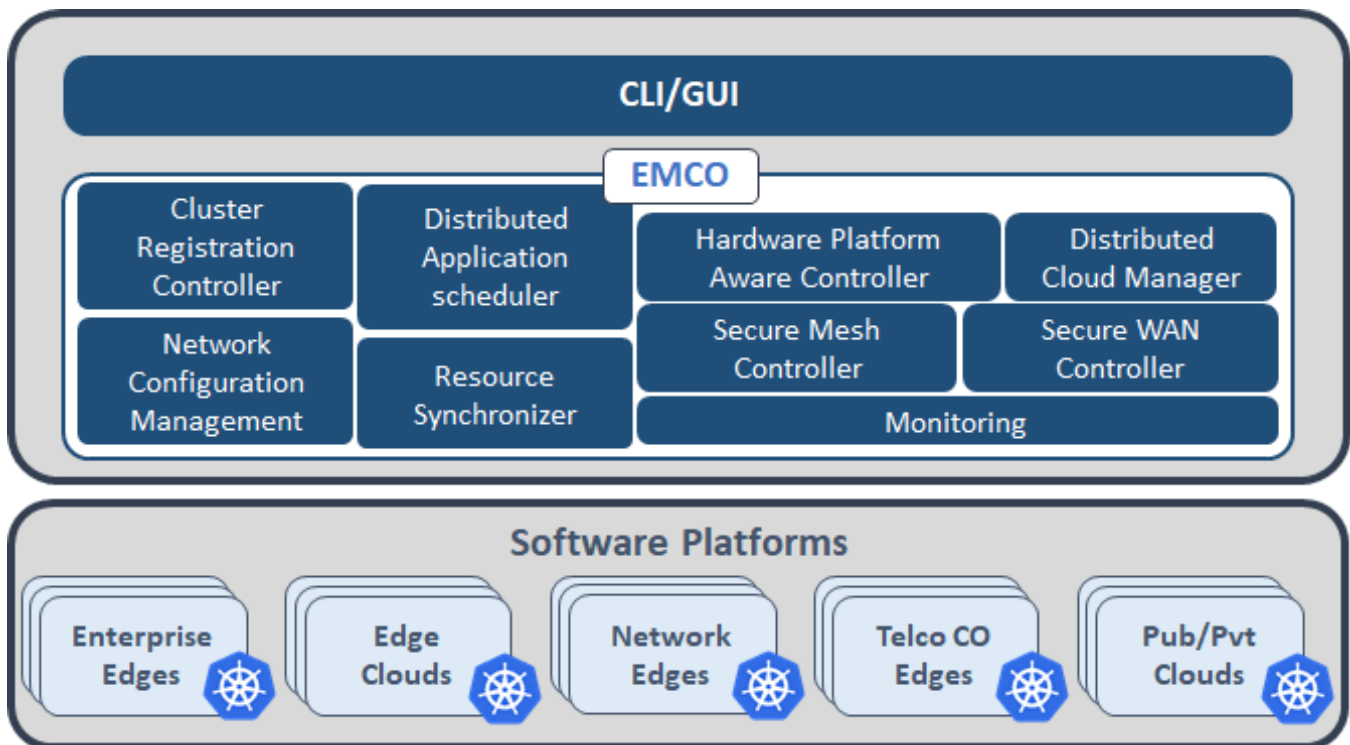
The Edge Multi Cloud Orchestrator (EMCO) - also previously known as ONAP4K8S version 2 - is an application orchestrator designed to deploy geo-distributed applications across multiple edge/cloud kubernetes clusters.

See the following articles for background on the requirements and architectural principles:

- Geo-Distributed Application/Network-Service Requirements: <https://www.linkedin.com/pulse/geo-distributed-application-orchestration-across-k8s-addepalli>
- Guidelines we followed: <https://www.linkedin.com/pulse/central-orchestrator-onap4k8s-generic-design-srinivasa-addepalli>
- Architecture of ONAP4K8s(EMCO): <https://www.linkedin.com/pulse/onap4k8s-architecture-srinivasa-addepalli>
- How does it compare to other Industry solutions: <https://www.linkedin.com/pulse/multi-cluster-application-orchestration-industry-value-addepalli>

Architecture Overview

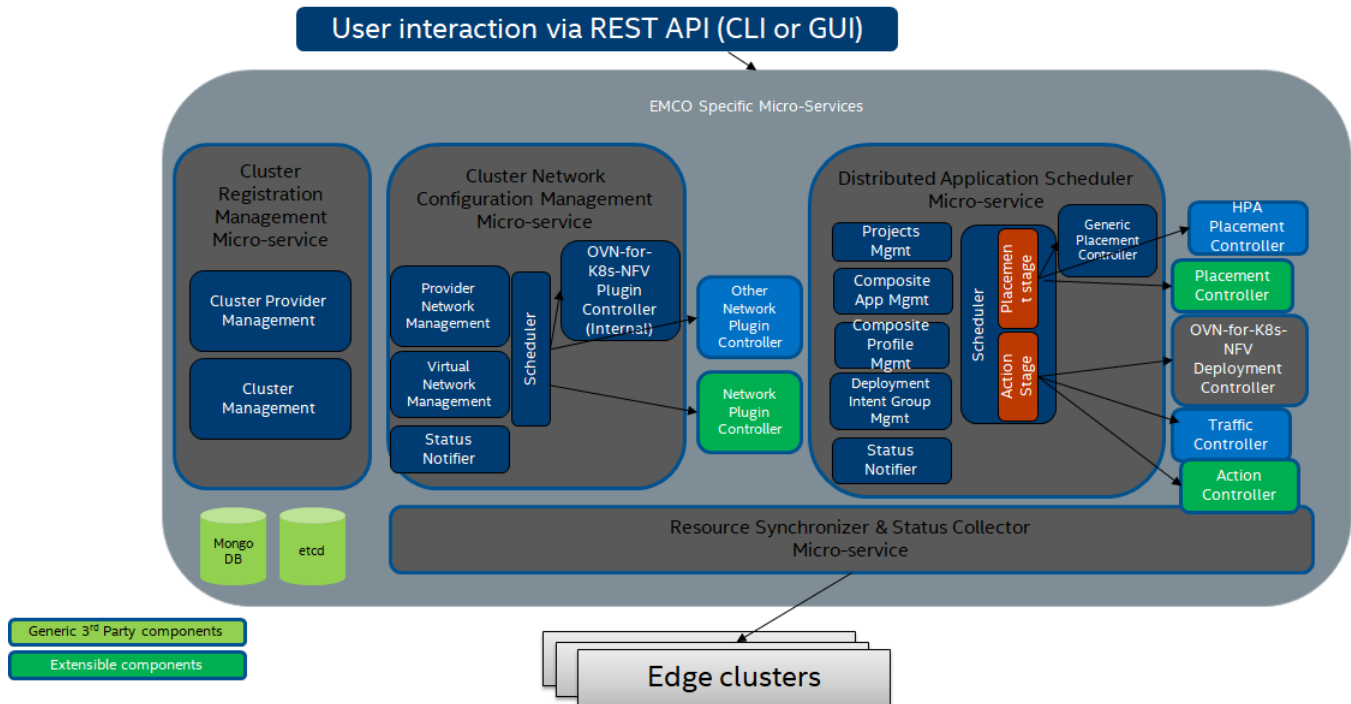
The following diagram depicts a high level overview of the EMCO architecture.



- **Cluster Registration Controller** registers clusters by cluster owners
- **Network Configuration Management** handles creation/management of virtual and provider networks
- **Distributed Application Scheduler** provides simplified, and extensible placement
- **Hardware Platform Aware Controller** enables scheduling with auto-discovery of platform features/ capabilities
- **Distributed Cloud Manager** presents a single logical cloud from multiple edges
- **Secure Mesh Controller** auto-configures both service mesh (ISTIO) and security policy (NAT, firewall)
- **Secure WAN Controller** automates secure overlays across edge groups
- **Resource Synchronizer** manages instantiation of resources to clusters

- **Monitoring** covers distributed application

The following diagram illustrates additional details of the EMCO architecture.



The following sections will describe specific components in greater detail.

[Distributed Application Scheduler](#)

[Resource Synchronizer](#)

[Cluster Registration Controller](#)

[Network Configuration Management](#)

[Distributed Cloud Management](#)

[Status Monitoring](#)

[Placement Controllers](#)

[Action Controllers](#)

Getting Started - EMCO Installation

The EMCO microservices can be installed into a Kubernetes cluster.

See here for the helm chart: <https://github.com/onap/multicloud-k8s/tree/master/deployments/helm/onap4k8s>

To install with kubectl, see here: <https://github.com/onap/multicloud-k8s/tree/master/deployments/kubernetes>

The clusters to which EMCO deploys resources can be any Kubernetes cluster. However, because EMCO provides built in OVN4K8S networking support, clusters with OVN4K*S installed is required if that networking option is needed.

The KUD project provides one method for installing a cluster that has these required features: <https://github.com/onap/multicloud-k8s/tree/master/kud>

Also, for status monitoring, EMCO utilizes the monitor microservice and associated CRD.

Current files needed to setup and install are here: <https://github.com/onap/multicloud-k8s/tree/master/src/monitor/deploy> (see the monitor-deploy.sh file)

EMCO Operations