Elastic Services Controller Overview

Cisco Elastic Services Controller (ESC) is a Virtual Network Functions Manager (VNFM) and it performs life cycle management of Virtual Network Functions (VNFs). ESC provides agentless and multi vendor VNF management by provisioning the virtual services and monitoring their health and promotes agility, flexibility, and programmability in Network Function Virtualization (NFV) environments. It provides the flexibility to define rules for monitoring, and associate actions that are triggered based on the outcome of these rules. Based on the monitoring results, ESC performs scale in or scale out operations on the VNFs. In the event of a VM failure ESC also supports automatic VM recovery.

ESC fully integrates with Cisco and other third party applications. As a standalone product, the ESC can be deployed as a VNF Manager. ESC integrates with Cisco Network Services Orchestrator (NSO) to provide VNF management along with orchestration. ESC as a VNF Manager targets the virtually managed services and all service provider NFV deployments such as virtual video, WiFi, authentication and so on. Complex services include multiple VMs that are orchestrated as a single service with dependencies between them. These multiple VMs are managed as a single entity, such as, Virtually Managed Services (vMS) 1.0 and later.

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Key Features of Elastic Services Controller

- Provides open and modular architecture, which allows multi-vendor OSS, VNF and VIM support.
- Provides end-to-end dynamic provisioning and monitoring of virtualized services using a single point of configuration.
- Provides customization across different phases of life cycle management; while monitoring the VM, service advertisement, and custom actions.
- Provides agentless monitoring with an integrated Monitoring Actions (MONA) engine. The monitoring engine provides simple and complex rules, to decide scale in and scale out of VMs.
- Provides scale in and scale out options based on the load of the network.
- Deploys or removes VMs based on the monitoring errors and threshold conditions detected as part of healing (also called as recovery).
- Supports service agility by providing faster VNF deployment and life cycle management.
• Supports multi-tenant environments.
• Supports REST and NETCONF / YANG interfaces to provide better hierarchical configuration and data modularity.

ESC Architecture

Cisco Elastic Services Controller (ESC) is built as an open and modular architecture, that allows OSS, and multi-vendor support. It performs life cycle management of the VNFs, that is, VNF onboarding, configuring the VNFs, monitoring them, and making VNF level life cycle decisions such as healing and scaling based on the KPI requirements. ESC and its managed VNFs are deployed as VMs running within a Virtual Infrastructure Manager (VIM). Currently, OpenStack and vCenter 6.0 are the supported VIMs. The ESC core engine manages transactions, validations, policies, workflows, VM state machines and rollbacks. The monitoring and actions service engine in ESC performs monitoring based on several monitoring methods. Events are triggered based on the monitoring actions. The monitoring engine also supports custom monitoring plugins.

ESC can be configured for High Availability. For details, see the Cisco Elastic Services Controller Install and Upgrade Guide.

ESC interacts with the top orchestration layer using the REST and NETCONF/YANG NB APIs. The orchestration layer can be a Cisco NSO or any third party OSS. ConfD enables integration with NSO by adding NETCONF/YANG northbound interface support. A configuration template, Virtual Network Function Descriptor (VNFD) file is used to describe the deployment parameters and operational behaviors of the VNFs.
The VNFD file is used in the process of onboarding a VNF and managing the life cycle of a VNF instance. **Figure 1: Cisco Elastic Services Controller Architecture** represents the Elastic Services Controller architecture.

**Figure 1: Cisco Elastic Services Controller Architecture**