



Introduction

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Solution Overview

Cisco MSX is a service creation and delivery platform that enables fast deployment of cloud-based and on-premise networking services for customers. Operators can deliver customizable network services using a subscription-based and pay-as-you-go model from a solution which allows them to rapidly and profitably deliver service offerings to market.

Cisco MSX also integrates with existing customer premise equipment, allowing operators to build upon and utilize the existing infrastructure. Cisco MSX provides a complete self-service user experience that allows operators and end-users to select, create, customize, and activate services on-demand in minutes from a simple, intuitive portal.

The Cisco MSX solution shifts the deployment of managed services away from the manual configuration of the latest network devices to the creation of an abstracted model representing the service definition. This approach allows the service intent of the user to be realized by using service models to automate the creation and customization of network services. Depending on the capabilities of the domain being configured, these services are instantiated either through Cisco MSX embedded Cisco Network Services Orchestrator (NSO) instance or a domain specific controller.

Through the combination of the Cisco MSX platform and service packs, the Cisco MSX solution offers a complete platform that enables Operators to offer next-generation network services.

The following are some key highlights of the Cisco MSX solution:

- Automated end-to-end, cloud-based, and on-premise services managed from public or private clouds.
- Secure multi-tenant cloud managed platform, simplified orchestration, and tenant self-service.
- Auto onboarding of devices with Zero Touch Provisioning.
- Rapidly create new monetizable services, and modify existing services instantly from the cloud.
- Perfect solution for distributed customers looking for lower cost and self-managed services.
- Open multi-vendor services catalog.
- Supports Cisco and third-party physical devices and Virtual Network Functions (VNFs).
- Develop your own service or adapt existing services.
- Can be integrated with existing OSS and BSS systems.

The chapter has the following section:

Cisco MSX Platform

Cisco MSX is a service creation platform, implementing the different functions that are required to instantiate and provision virtual and physical elements in order to construct end-to-end managed services for Service Provider and Enterprise customers. The Cisco MSX solution uses Software-Defined Networking (SDN), Network Functions Virtualization (NFV), Open APIs, and advanced orchestration capabilities to deliver a suite of business services from the cloud (public or private), over existing network infrastructure.

The Cisco MSX platform is comprised of layers, each of which abstract the layer below it and scaled horizontally. A layered abstraction approach, with well documented API contracts between the layers, allows for modularization, a key tenet of the Cisco MSX platform.

The modularization allows for the separation of concerns, independent scaling, development velocity, and ultimately component replacement, if necessary.

Microservices

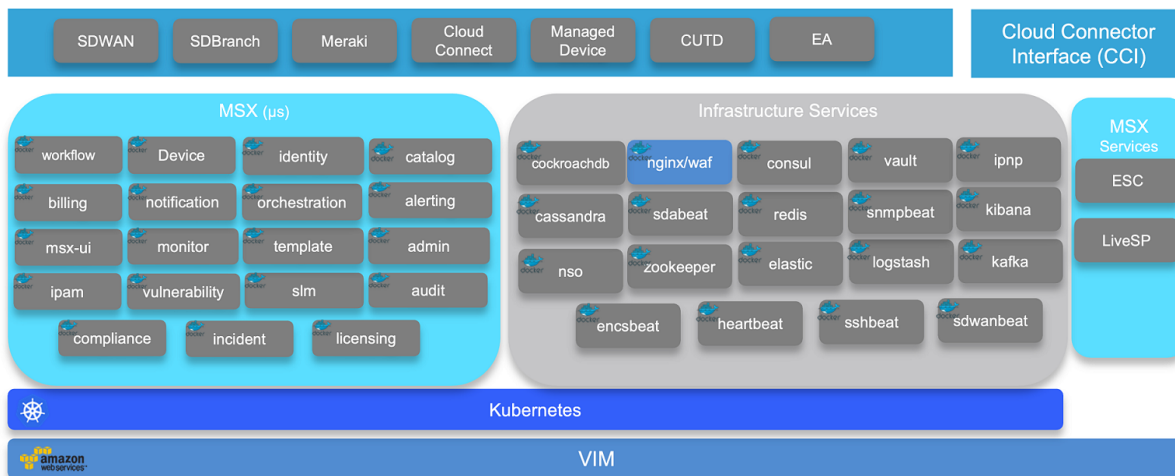
The Service Interface Function (SIF) and integrations are enabled as microservices that contain the logic to consume the functionality exposed by the platform. There is a standard set of microservices that expose the core platform functionality that is required to operate the platform.

Each use case can also provide one or more microservices for any use-case-specific functionality that needs to be enabled.

The following primary core microservices exist in Cisco MSX platform:

- Identity Management (IDM)—Provides user management capabilities, tenant management (tenant and tenant group), manages identity providers, user roles, permissions, secrets, password policies, and so on. Upon login, fetches the user profile and stores it in the common cache so other microservices can use it. Also provides SAML 2.0 and OAuth 2.0 capabilities for Single Sign On (SSO), authentication, and authorization capabilities.
- Catalog—Provides the capability to create services, service offers, price plans, define terms and conditions of a service, submit an order, and upgrade or downgrade a service.
- Manage—Provides the service management capabilities, such as managing customer subscriptions and device data.
- Monitor—Communicates with the service assurance components for device and service status and displays the statistics on the Portal.
- Orchestration—Communicates with NSO to process the request to create or upgrade a service chain, add or delete a device, register device serial numbers, and advanced device configurations.
- Notification—Cisco MSX provides support to trigger notifications when certain events occur. Both REST and email notifications are supported for all the events.
- Administration—Manages global activities and settings. Activities include importing bulk device settings, obtaining component versions, scheduling tasks, managing provider contacts, and user interface themes.
- Process Automation—Provides the capability to manage and execute service-oriented workflows
- Billing—Provides the capability to collect and expose billing related events.
- Incident—Enables you to integrate the Cisco MSX platform with an incident tracking system specially ServiceNow. Using this API, you can create, update, cancel, close, and delete an incident using the access token.
- Service Configuration—Manages configuration templates, track the assignment and application of those templates to a tenant.

Figure 1: Cisco MSX Infrastructure and Microservice Architecture



Data Platform

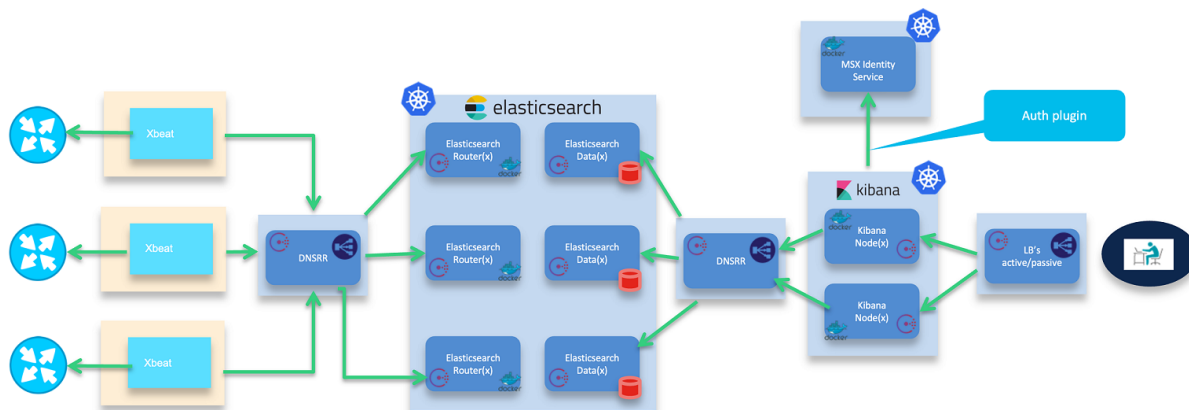
The data platform interface is the mechanism by which the data platform component interacts with the other platform components and applications. The major function that is performed by the data platform component is the collection of data from the platform, service packs, controllers, and devices. The collection interface provides a platform component or application the ability to instruct the data platform which data to collect, the frequency with which to collect, and how to store and correlate the data. This is to enable other platform components or external systems to augment the collection that is enabled by provisioning. For example, the instantiation of a typical service chain programs the devices participating in the chain to send data (e.g. Syslog/SNMP) to the data platform.

There are several actions that must be supported by the data platform component, and thus exposed via the service interface. The actions include, but are not limited to:

- Data Retrieval (Pull)
- Configurable Collection
- Data Subscription/Streaming (Triggers/Events)

The data platform component of the architecture is broken down into the following major sub-functions, as shown in the following illustration.

Figure 2: Data Platform Architecture Based on ELK Stack



Terminology

The following table provides an alphabetical listing of Cisco MSX acronyms.

Table 1: Terminology

Acronym	Definition
AAA	Authentication, Authorization, and Accounting
ACL	Access List
API	Application Programmable Interface
ARPU	Average Revenue Per User
ASAv	Adaptive Security Appliance - vFW VNF
BGP	Border Gateway Protocol
BSS	Business Support System
CDB	Configuration Database
CFS	Consumer Facing Service
CLI	Configuration Line Interface
CMSP	Cisco Cloud and Managed Service Program
CPE	Customer Premise Equipment (ISR-G2)
CRUD	Create, Read, Update, and Delete orchestration operations
CSR	Cloud Service Router - vRouter VNF
cURL	Client URL
DC	Data Center
DCI	Data Center Interconnect

Acronym	Definition
DEST	Destination IP Address
DHCP	Dynamic Host Configuration Protocol
DMVPN	Dynamic Multi-Point Virtual Private Network
DMZ	Demilitarized Zone (Networking private to public)
DNS	Domain Name System
DST	Destination IP Address
EIGRP	Enhanced Interior Gateway Routing Protocol
ESC	Elastic Services Controller
ETS	European Telecommunications Standards
ETSI	European Telecommunications Standards Institute
EzVPN	Easy Virtual Private Network
FW	Firewall
GraphDB	Graph Data Base
GuestOS	Guest Operating System
HA	High Availability is
HDR	Header
HTTP	Hypertext Transfer Protocol
I2RS	Interface to Routing System (diagram format)
IKEv2	Internet Key Exchange version 2
IO	Input/Output
Intrusion Detection	Generally refers to the process of passively analyzing network traffic for potential intrusions and storing attack data for security analysis.
Intrusion Prevention	Includes the concept of intrusion detection, but adds the ability to block or alter malicious traffic as it travels across your network
iOS	Cisco Operating System
IP	Internet Protocol
IPSec	Internet Protocol Secure
ISR	Integrated Service Router
IT	Information Technology
KVM	Kernel-based Virtual Machine
LAN	Local Area Network
ML2	Modular Layer 2
MPLS	Multiprotocol Label Switching

Acronym	Definition
MSX	Managed Services Accelerator
NAT	Network Address Translation
NAT44	Network Address Translation IPv4-to-IPv4
NED	Network Element Driver
NEDs	Network Element Drivers
NETCONF	Network Configuration protocol
NFV	Network Functions Virtualization
NH	Next Hop
NIC	Network Interface Card
NICs	Network Interface Cards
NSO	Network Service Orchestrator
ODL	Open Daylight
OS	Operating System
OSPF	Open Shortest Path First
OSS	Operations Support System
OVS	Open Virtual Switch
PE	Provider Edge
PnP	Plug-N-Play
QEMU	Quick Emulator
QoS	Quality of Service
RA	Remote Access
REST	Representation State Transfer
RFC	Request For Comments
RFS	Resource Facing Service
ROI	Return on Investment
SA	Source Address
SDN	Solution uses software-defined networking
SLA	Service Level Agreement
SMB	Small Medium Business
SNMP	Simple Network Management Protocol
SP	Service Provider
SRC	Source IP Address

Acronym	Definition
SSH	Secure Shell
SSL	Secure Sockets layer
SUDI	Secure Unique Device Identifier
TCO	Total Cost of Ownership
TP	Termination Point
UCS	Unified Computing System
vFW	Virtual Firewall
VIM	Virtual Interface Manager
VirtIO	Virtual Input/Output
VLAN	Virtual Local Area Network
VM	Virtual Machine
VMs	Virtual Machines
VNF	Virtual Network Function
VNFs	Virtual Network Functions
VNIC	Virtual Network Interface
VPN	Virtual Private Network
VPP	Vector Packet Parsing
VR	Virtual Router
VRF	Virtual Route Forwarding
VRRP	Virtual Registry Registrar Protocol
WAN	Wide Area Network
WCCPv2	Web Cache Communications Protocol
WSA	Web Security Appliance
WSAv	Web Security Appliance virtualized
XML	eXtensible Marking Language
YANG	Yet Another Next Generation (data modeling)
ZTD	Zero Touch Deployment

About this Content

This section provides information about related documentation of Cisco MSX and trademarks used in this content.

Related Documentation

You can access Cisco MSX 4.3.0 content at [Cisco MSX End User Documentation](#).

The documents listed here are available for additional reference. To access API documentation on the Swagger GUI, log in to the Cisco MSX GUI and navigate to **My Profile > Swagger API**.

Cisco MSX SDK documentation is available at <https://developer.cisco.com/site/msx/>.

Document	Description
Cisco Managed Services Accelerator (MSX) 4.3 Release Notes Documentation	This documentation provides information about the new features in Cisco MSX 4.3.
Cisco Managed Services Accelerator (MSX) 4.3 Administration Documentation	This documentation covers the post-install configuration information that is required to set up Cisco MSX.
Cisco Managed Services Accelerator (MSX) 4.3 Platform and Service Pack Permissions Addendum	This addendum covers all the permissions that are required to operate Cisco MSX and the service packs.
Cisco Managed Services Accelerator (MSX) 4.3 SD-WAN Service Pack Documentation	This documentation includes details that are related to deploying, managing, configuring the Cisco MSX SD-WAN service pack, and troubleshooting service errors.
Cisco Managed Services Accelerator (MSX) 4.3 SD-WAN Out-of-the-Box Applications Addendum	This document is an addendum to the <i>Cisco MSX SD-WAN Service Pack</i> content. It has details about the out-of-the-box applications of Cisco MSX 4.3 and the comparison of applications in older releases with applications in Cisco MSX 4.3 based on possible application mapping.
Cisco Managed Services Accelerator (MSX) 4.3 Enterprise Access Service Pack Documentation	This documentation includes details that are related to deploying, managing, configuring the Cisco MSX Enterprise Access service pack, and troubleshooting service errors.
Cisco Managed Services Accelerator (MSX) 4.3 Managed Device Service Pack Documentation	This documentation includes details related to subscribing the Cisco MSX Managed Device service pack, configuring the service, and troubleshooting service errors.
Cisco Managed Services Accelerator (MSX) 4.3 Solution Overview Documentation	This documentation provides a comprehensive explanation of the design of the Cisco MSX solution that enables service providers to offer flexible and extensible services to their business customers.
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