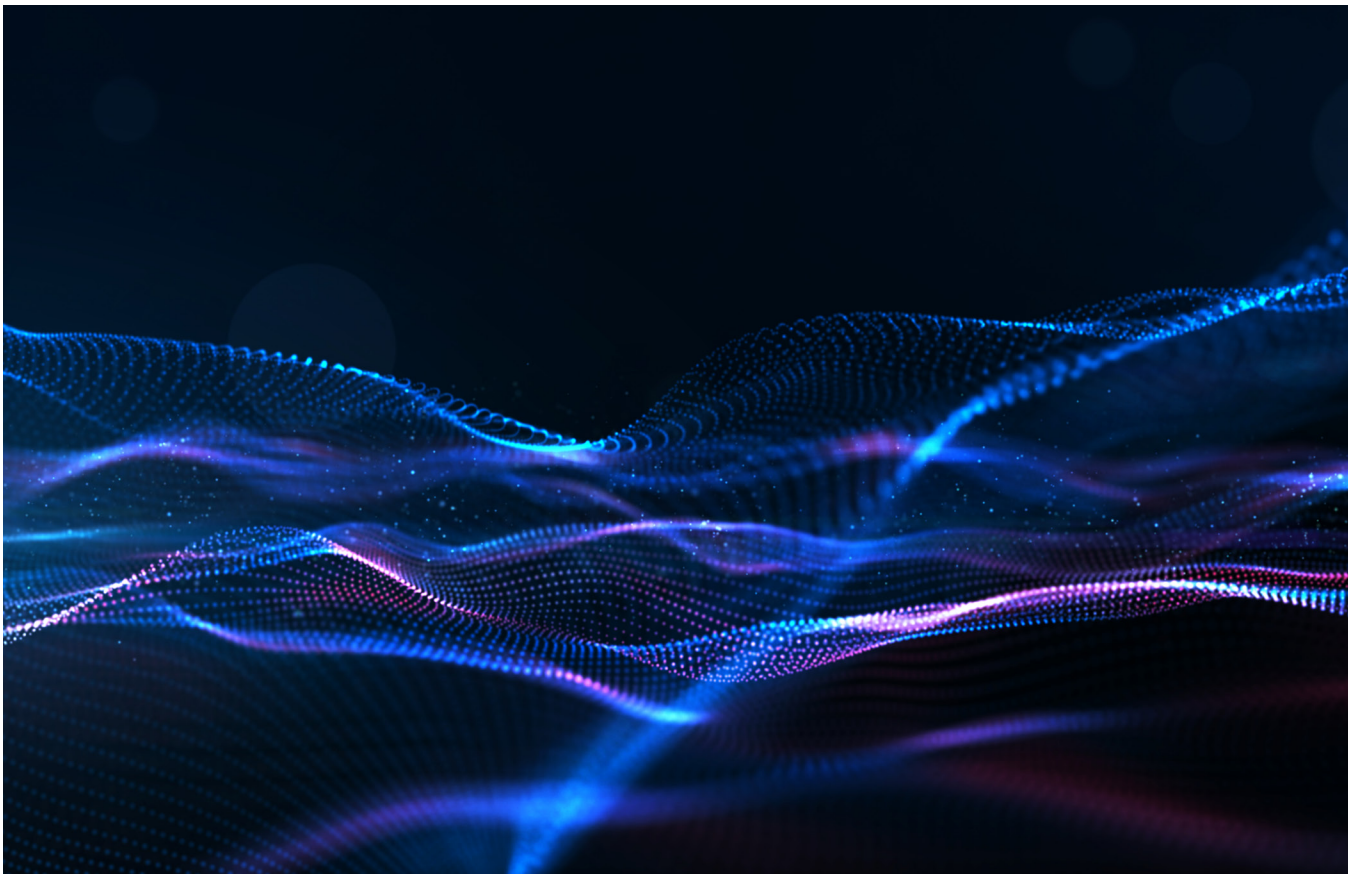

MOSAIC CLOUD PLATFORM

Addressing the Service Delivery Evolution

Highlights

- **Shorten time to revenue by operating a single, unified, vendor-neutral access domain controller and orchestrator**
- **Streamline service delivery, business model development with a simple and extensible plugin architecture**
- **Increase network resiliency providing a path to increased network automation, intelligence, and optimization**

Access Network Evolution

Access network architectures are rapidly evolving to encompass many data center design principles including disaggregation, virtualization, SDN control and open source software integration. The challenge is that many of these architectural evolutions are underdeveloped. However, operators need to deploy robust network infrastructure solutions today that can adapt to these emerging architectural evolutions as they mature.

Why Mosaic Cloud Platform?

Mosaic™ Cloud Platform (Mosaic CP), acting as an access domain SDN controller and orchestrator, provides an evolution from vendor-specific element management systems using semi-automated provisioning of individual access technologies to support fully automated orchestration and SDN control of multi-vendor, multi-technology networks operating across multiple domains. Mosaic CP is built to tackle function such as orchestration of disaggregated fiber access systems, OSS adapters, and traditional fault, configuration, accounting, performance, and security (FCAPS) functions.

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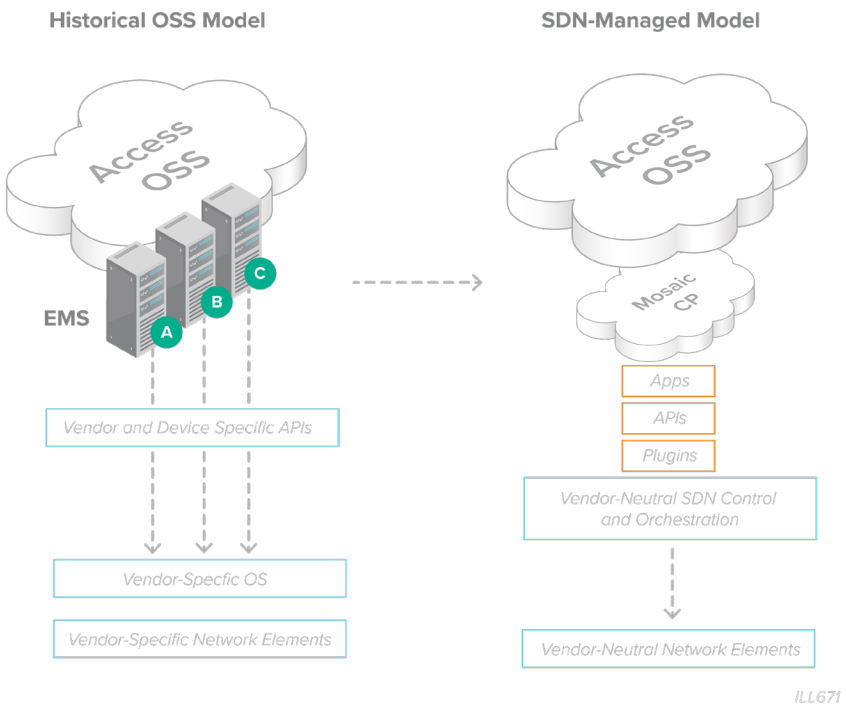


Mosaic CP is architected to meet the needs of today and the next-generation networks of tomorrow to enable an on-demand, agile service delivery framework.

Shorten Time to Revenue

Mosaic CP offers the flexibility and confidence to select multiple vendors, equipment, open source software and technologies without the risk of being locked into any specific vendor or component. Mosaic CP compliments the Adtran SDX Series of software-defined network elements, and supports Adtran legacy and third-party network equipment, enabling service providers to orchestrate their access broadband network domains with data center scale and agility. This agility allows network operators to retain their current market share and also compete for new services revenue.

Mosaic CP incorporates open carrier-class orchestrator and controller functions that are built ground up utilizing a modern microservices-based architecture. It complements open source SDN controllers to provide orchestration, control, and management features optimized for the access domain. It enables carriers to create and manage network objects–devices, interfaces and services end-to-end. The controller functions support large-scale, multi-vendor device connectivity using modern and legacy interfaces to support end-to-end orchestration capabilities. Mosaic CP was designed to replace the traditional FCAPS functions performed by traditional EMS systems in a more modern, vendor-neutral and scalable architecture while also addressing the next generation of needs including orchestration of a wide range of physical network functions (PNFs) and virtual network functions (VNFs). Mosaic CP allows orchestration, monitoring, and control of vendor-neutral network elements by modeling them as objects and allowing the user to perform a common set of actions. These actions help orchestrate on-demand provisioning of services, applications, and from cloud-edge to subscriber-edge.

The capabilities of Mosaic CP to model networking devices generically has been applied in multiple customer use cases involving Gfast DPUs and 10G PON. This ability to unlock control and management functions from the underlying network elements allows Mosaic CP to integrate other third-party devices, such as fixed-wireless radios, to provide seamless orchestration and management–simplifying the end-to-end service management process.

Furthermore, the orchestrator function in Mosaic CP encapsulates device-specific modeled constructs into simplified and generic "network and service intents." Intents abstract complex device models into simplified definitions for services and device configuration. These intents can be manipulated and applied to devices and interfaces through the Mosaic CP graphical user interface or a programmable RESTCONF application program interface. Mosaic CP supports customization, allowing you to adapt the native RESTCONF interface to a different protocol of choice if required. Mosaic CP also offers feature-rich analytics, collecting and reporting rich performance, utilization, and events information from your networking devices allowing you to monitor and proactively manage your network.

Streamline Service Delivery

New innovation and rapid service creation is a key driver for your business's success. While generic devices and actions offer a simplified orchestration interface, Mosaic CP also offers streamlined and automated service delivery across both Adtran and third-party network elements by leveraging plugins. Unlike traditional element management systems (EMS), the plugin architecture allows rapid prototyping and verification of new devices. This offers a powerful way to extend support for third-party devices.

The controller functions within Mosaic CP enable orchestration and automation across both Adtran and third-party network elements by mediating connections to devices over different protocols such as NETCONF, CLI, RESTCONF and SNMP. The controller design allows for several thousands of concurrent southbound sessions with network elements. The versatility of the southbound device management protocols supported in Mosaic CP allows it to interface with multi-vendor devices – both modern and legacy equipment.

Mosaic CP allows for easy customization to create a vendor-agnostic environment with the available Mosaic Plugin Software Development Kit (SDK). The Mosaic Plugin SDK provides an easy way for users to develop their own plugins through a step-by-step process for third-party plugin development and integration. Plugins can be developed rapidly using the popular Python programming language. By offering tutorials and example workflows, the Mosaic Plugin SDK makes it easy for you to customize Mosaic CP to meet your network needs of today and tomorrow.

The Mosaic Plugin SDK alleviates the need for various EMS applications, accelerating the integration of network equipment, allowing the Mosaic CP to easily manage your entire network. This agile approach enables easy and fast integration of networking equipment that enables simple collaboration between network teams and vendors. This allows for vendor-agnostic device management from a single platform.

Increase Network Resiliency

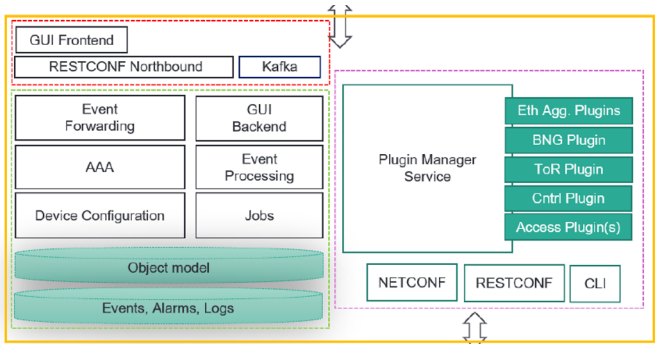
Mosaic CP's open interfaces and plugin SDK, make it the ideal platform to place at the center of the next-generation, distributed access architecture powered by commercial and/or white box network element vendors. Utilizing Mosaic CP ensures your network can easily evolve with your business direction by supporting various use cases, including:

Traditional EMS - Mosaic CP offers the flexibility to conduct FCAPs/EMS operations, providing the functionality that you will need today, with the ability to evolve into the center of your next-generation, distributed access architecture of tomorrow.

Access Domain Orchestrator - Provides the business logic for creation and provisioning of services or applications. As an Access Domain Orchestrator, Mosaic CP consists of a collection of network management system (NMS) applications built on open-source software, that are interconnected via Application Programming Interfaces (APIs) that can scale independently without impacting the system.

Access Domain SDN Controller – This includes a core, open, Software Defined Network (SDN) controller and embedded applications that separate the underlying network complexity from the orchestration layer. Device adapters and aggregators connect the underlying physical and virtual network functions to the SDN controller. Mosaic CP mediates connections to devices over different protocols such as NETCONF, CLI, RESTCONF, MQTT and SNMP to simplify device programmability.

To support these use cases there are Mosaic Network Modules which offer an array of software applications providing high-scale telemetry collection, closed-loop automation, network management, and network insight. Mosaic CP provides the flexibility, programmability, and scalability to serve as a typical EMS now with the power to evolve to a modern next-generation management system in the future. Allowing you to pay for the services that you need currently and grow the platform as your network matures in the future.



The Adtran Approach

Adtran has a unique understanding of the transition facing operators today. To enable network control, insights, and optimization applications and do so across all network elements, modern access networks must use open networking architectures that support the ultra-short micro-release schedules needed to build a self-driving network.

For over three decades, Adtran has been enabling service providers to deliver the services their customers need when they need it. Today is no different. Mosaic CP allows you to take control of network evolution by shortening time to revenue, streamlining service delivery, and increasing network resiliency.

Built on a modern microservices architecture, optional open- source SDN controller, and open APIs, Mosaic CP provides a consistent northbound service-oriented interface to existing OSS systems and a bridge to next-generation network automation platforms, regardless of vendor, platform, or technology. Mosaic CP is the network management system of today and next-generation network automation platform of tomorrow.

MOSAIC CLOUD PLATFORM

Product Features:

- FCAPS/EMS features
- End-to-end multi-vendor, multi-technology service orchestration
- End-to-end service level APIs and abstraction to legacy and modern devices
- Integrates open source, access-optimized controllers
- Zero-touch commissioning of network devices
- Persistent configuration for offline service provisioning
- Reflow of service provisioning
- Bulk PM/telemetry collection and storage (including streaming telemetry)
- Closed-loop automation applications
- Real-time service assurance collection and monitoring
- OSS adapters to translate back to operator-specific OSS interfaces
- Configurable southbound and northbound plugins

Product Specifications

Mosaic Cloud Platform is packaged as an installer, providing flexible options across a wide range of installation environments. It supports deployments across data centers in an active – standby configuration

Recommended Minimum Requirements*

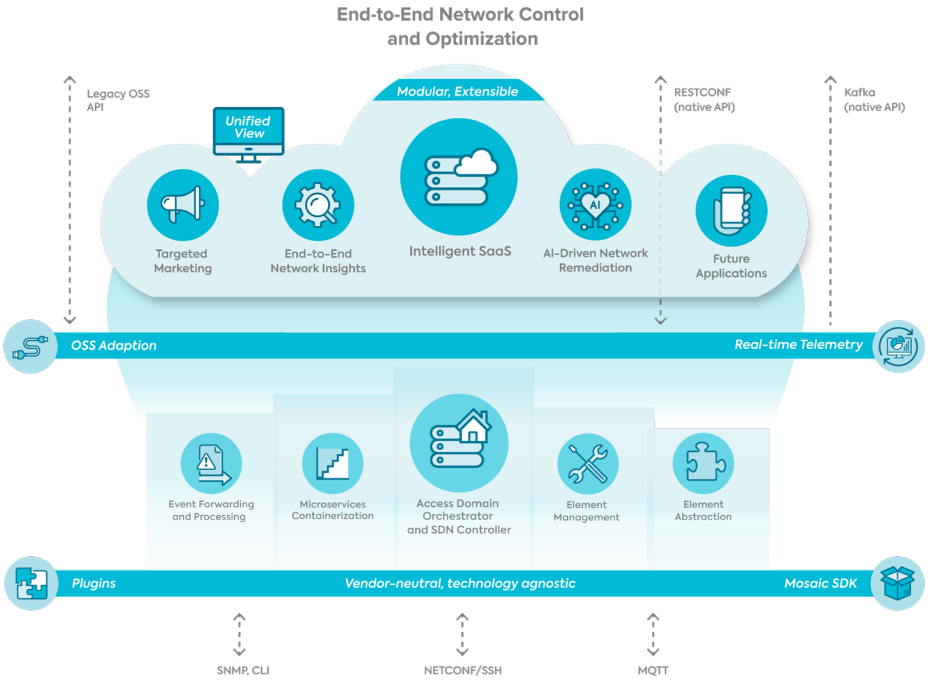
Virtual Machine Specs

- Base Memory: 16 GB
- Processor(s): 4 CPU cores
- Storage: 500 GB

Operating System Specs

- CentOS 7.x
- RedHat 7.x
- RedHat 8.x

Adtran Mosaic Software Suite



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