

# APPLICATION SERVICES MODULAR LINE CARD (AS-MLC)

## Product Overview

The Application Services Modular Line Card (AS-MLC) is an x86-based card for Juniper Networks MX Series 3D Universal Edge Routers. The combination of x86 processing, the MX Series Trio chipset and 6.4 TB of solid state storage create a platform that can support a wide variety of applications on an integral Juniper high-performance data plane. Juniper Networks Junos Content Encore, an innovative software platform that provides high-performance caching and content delivery capabilities, is the first application supported on the AS-MLC.

## Product Description

Juniper's Application Services Modular Line Card (AS-MLC) offers integrated application services solutions for the Juniper Networks® MX Series 3D Universal Edge Routers. The combination of x86 processing with the Juniper Networks Trio chipset creates a platform that can adapt to a wide variety of applications running on Juniper's high-performance data plane. The AS-MLC is designed to deliver high application throughput, and it supports large scale solid-state storage needed for content delivery applications such as the Juniper Networks Junos® Content Encore portfolio. Additionally, the AS-MLC can serve as the platform for Juniper Networks JunosV™ App Engine, powering a host of network applications directly embedded into your MX Series 3D Universal Edge Routers. This provides an integrated services solution for network service operators that can benefit by expanding the range of applications and services offered to their end customers in a cost-effective and scalable manner.

## Architecture and Key Components

As an x86-based card for MX Series routers, the AS-MLC modular design consists of three components: the Application Services Modular Carrier Card (AS-MCC) with a Trio-based chipset connecting to the chassis backplane; the Modular Processing Card (MXC); and a Modular Storage Card (MSC) with solid state storage.

The AS-MCC, which is the carrier card for the AS-MLC, fits vertically in the MX Series backplane and provides Peripheral Component Interconnect Express (PCIe) switching and a high-speed fabric interface to the MX Series backplane, which acts as an integrated service plane without a front facing ingress or egress interface.

With up to 40 Gbps throughput per blade, and up to eight AS-MLCs per MX960 chassis, service operators can support 320 Gbps of application throughput on an edge node. The Enhanced Switch Control Board (SCBE) is required for the MX960, MX480, and MX240 3D Universal Edge Routers to operate the AS-MLC.

## Junos Content Encore

The first application supported on the AS-MLC is the Junos Content Encore, an innovative software platform that provides high-performance caching and content delivery capabilities. Rich media content delivered over the Internet consumes a tremendous amount of bandwidth, creating bottlenecks from the access network to the core to the data center. Network service providers are seeking ways to efficiently deliver this content—to optimize their networks, drive down transit costs, and to introduce new revenue generating services. Junos Content Encore running on the AS-MLC enables this key caching and content delivery technology to be directly integrated into the MX Series 3D Universal Edge Routers—providing superior performance and enabling providers to leverage their existing investments in the MX Series as they optimize the network for efficient content delivery. Router-integrated caching technology can also be the foundation for many exciting new services, such as the multiscreen TV services delivered via adaptive bit-rate streaming. For more detailed information on Junos Content Encore, please see [www.juniper.net/us/en/local/pdf/datasheets/1000316-en.pdf](http://www.juniper.net/us/en/local/pdf/datasheets/1000316-en.pdf).

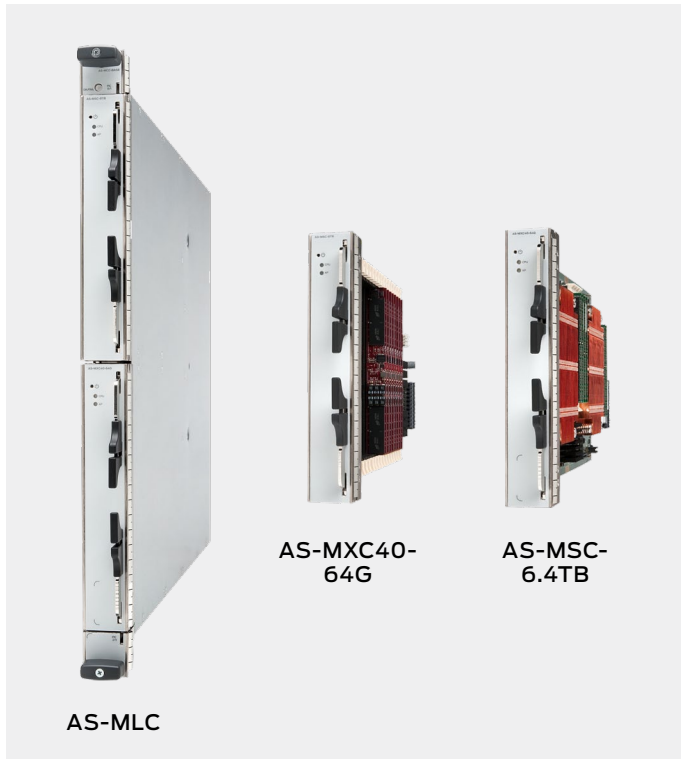
## Services Platform Hardware

Table 1: Application Services MLC Hardware

Product	Description
AS-MCC	Modular Carrier Card for MX Series includes: <ul style="list-style-type: none"><li>• Switch fabric interfaces to the chassis</li><li>• Trio chipset</li><li>• Two open slots for MXC and MSC</li></ul>
AS-MXC40-64G	Modular Processing Card includes: <ul style="list-style-type: none"><li>• High-performance, multi-core CPU with 2xOctal core x86 Intel Processor</li><li>• 64 GB RAM</li><li>• Up to 40 Gbps of maximum bandwidth</li><li>• CPU status LED</li><li>• Indicator LED</li><li>• Front panel port: 1 USB</li></ul>
AS-MSC-6.4TB	Modular Storage Card supports: <ul style="list-style-type: none"><li>• 8 TB MLC flash with up to 6.4 TB usable storage</li><li>• LED indicator for flash card status and storage operation</li></ul>

Table 2: AS-MLC Features and Benefits

Feature	Benefits
High performance	With support of up to 40 Gbps application throughput per blade and 6.4 TB of usable NAND storage, the AS-MLC is an industry-leading, high-performance solution.
Investment protection	Leverage your existing investments in MX Series networking infrastructure to rapidly and cost-effectively introduce new services.
Increased monetization	By supporting caching and content delivery capabilities on the MX Series, AS-MLC enables you to rapidly introduce new revenue generating services such as next-generation TV and video on demand (VOD) services, as well as premium broadband offerings.
Reduced power and space	Integrated with the application forwarding on MX Series routers, the AS-MLC minimizes the number of network nodes and provides increased service flexibility with reduced power and space requirements for the network infrastructure.
Increased network efficiency	With support for Junos Content Encore, network service providers and others can leverage the AS-MLC as a high-performance, router-integrated cache to improve the efficiency of delivering rich media content.
Resiliency and high availability	<ul style="list-style-type: none"><li>• AS-MCC, AS-MXC, and AS-MSC are hot-swappable.</li><li>• The AS-MLC can continue to provide nonstop caching for Junos Content Encore while nonstop active routing (NSR) and unified in-service software upgrade (unified ISSU) are performed on the MX Series system.</li><li>• AS-MLC supports Duraclass NAND management features that include DuraWrite, ECC, RIASE, wear-leveling, and monitoring. In addition, user control through write-throttling based on life expectancy, performance monitoring, and alert and reduced capacity modes for NAND are supported.</li></ul>
Modular design	With modular design, the AS-MLC enables you to select the mix of storage (AS-MSC) and processing (AS-MXC) for your unique requirements.
Future-proof design	Both the AS-MSC and AS-MXC are designed to be able to take advantage of future enhancements in flash and chipsets, ensuring that your investment in AS-MLC will be able to scale into the future.
Carrier-class reliability and standards compliance	When services like Junos Content Encore are integrated into the MX Series, they benefit from its carrier-class technology, overcoming the challenges of appliance-based solutions.



## Juniper Networks Services and Support

Juniper Networks is the leader in performance-enabling services that are designed to accelerate, extend, and optimize your high-performance network. Our services allow you to maximize operational efficiency while reducing costs and minimizing risk, achieving a faster time to value for your network. Juniper Networks ensures operational excellence by optimizing the network to maintain required levels of performance, reliability, and availability. For more details, please visit [www.juniper.net/us/en/products-services](http://www.juniper.net/us/en/products-services).

## Specifications

Table 3: AS-MLC Hardware Specifications

	AS-MCC	AS-MXC40-64G	AS-MSC-6.4TB
Dimensions (H x W x D)	10 x 15.5 x 1.227 in	11.25 x 6.5 x 1.227 in	11.25 x 6.5 x 1.227 in
Weight	10.5 lbs	3.4 lbs	1.4 lbs
Power requirements input/output	191 W	259 W	50 W

## Agency Approvals

### Safety

- CAN/CSA-22.2 No.60950-1
- UL60950-1
- EN 60950-1
- IEC 60950-1

### EMC Emissions

- AS/NZS CISPR22 Class A (Australia/New Zealand)
- EN 55022 Class A Emissions (Europe)
- FCC Part 15 Class A (USA)
- VCCI Class A (Japan)
- CNS13438 Class A (Taiwan)
- KN22 Class A (Korea)

### EMC Immunity

- EN300386
- EN55024
- KN24

### NEBS

- GR-63-Core Issue 3
- GR-1089-Core Issue 6
- SR-3580 (2007) NEBS Criteria Levels (Level 3)
- ETSI EN 300 019-2-1 – Storage, Class T1.2
- ETSI EN 300 019-2-2 – Transportation, Class T2.3
- ETSI EN 300 019-2-3 – Stationary Use, Class T3.2
- AT&T TP-76200 Issue 16
- Verizon TPR.9305 Issue 4

## Ordering Information

Model Number	Description
AS-MCC	Media Services Blade Modular Carrier Card for MX Series
AS-MXC40-64G	Media Services Blade 64 GB Modular Processing Card for MX Series with 40 Gbps of Maximum MFC BW
AS-MSC-6.4TB	Media Services Blade Modular Memory Card with 6.4 TB for MX Series

## About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at [www.juniper.net](http://www.juniper.net).

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