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MX67 and MX68 Overview and Specifications

Overview

Designed from the ground up with a new built-in cellular modem the MX67C and MX68CW are designed to simplify any deployment that requires a backup cellular uplink. This is ideal for small remote locations with unreliable WAN circuit providers or for sites that want the highest level of redundancy and availability. The Meraki Dashboard in addition with the built-in cellular uplink allows for simple and easy deployment of the MX67C or MX68CW with minimal pre-configuration in almost any location.

For smaller sites that don't require a backup cellular uplink but still need a capable device that can be easily deployed, the base models of the MX67 and MX68 are available without a built-in cellular uplink. The MX67 and MX68 are also available in Wireless models (MX67W / MX68CW) that can provide 802.11ac coverage for wireless clients.

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MX 67 e MX 68 - Especificações

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MX Sizing Guide

APRIL 2020

This technical document provides guidelines for choosing the right Cisco Meraki security appliance based on real-world deployments, industry standard benchmarks and in-depth feature descriptions.

MX Guia de dimensões

MX67 and MX68 Overview and Specifications

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Features

- Managed via Cisco Meraki Dashboard
- Automatic Firmware upgrades
- WAN Link Balancing
- Automatic WAN Failover
- SD-WAN over Meraki AutoVPN
- L3/L7 Stateful Firewall
- Geo based firewall rules
- 1:1 and 1:Many NAT
- Configurable VLANs / DHCP support
- Static Routing
- Client VPN endpoint
- Meraki AutoVPN and L2TP/IPSec VPN endpoint
- Active Directory integration
- Content Filtering
- Malware Protection (AMP) w/ optional Threat Grid integration
- IDS/IPS protection
- Custom Traffic Shaping
- Historical Client Usage statistics
- Netflow support
- Syslog integration
- Remote Packet Capture tools

Hardware Features

- Dual WAN uplinks
- Built-in Cellular CAT 6 LTE Uplink (Cellular models only, requires SIM card)
- Built-in 802.11ac Wireless capability (Wireless models only)
- Built-in PoE+ capabilities (MX68 only)

Configuration

The basic initial configuration of the MX67 and MX68 is just as simple as with other MX models. The links below provide additional information and instructions relating to each step in getting the device setup and configured for the first time.

1. Claim the device to an Organization on the Meraki Dashboard
    a. If a Dashboard Organization does not yet exist, Create one
2. Add the device to a Dashboard Network
    a. If a Network does not yet exist, Create one first
3. Physically connect the device to the local network
    a. Before inserting the SIM card, ensure the SIM is activated with the PIN disabled or the correct PIN entered. It may be necessary to use an external modem, or work with the cellular provider to have the PIN disabled or the SIM unlocked. (Cellular models only)
    b. If a custom APN is needed, ensure it is applied from **Cellular** section of the **Uplink** tab on the **Security Appliance > Appliance Settings** page. (Cellular models only)

c. Insert an activated SIM card to allow the cellular uplink to function (Cellular models only)
d. Ensure the cellular and/or wireless antennas are connected correctly (Cellular and Wireless models only)
e. Power on the device and let it check in to the Dashboard
f. If necessary, configure a Static IP on the WAN interface through the Local Status Page to allow it to check in.

4. Finish configuring the device from the Meraki Dashboard
   a. Manage local VLANs
   b. Modify Firewall rules
   c. Configure VPN connectivity

Context and Comparisons

	MX64	MX65	MX67	MX68
Dual WAN Uplinks	Yes (With LAN conversion)	Yes	Yes (With LAN conversion)	Yes
Backup Cellular Uplink	Via 3rd Party USB Modem	Via 3rd Party USB Modem	Built-in (Cellular models only), Via 3rd Party USB Modem	Built-in (Cellular Models Only), Via 3rd Party USB Modem
Stateful Firewall Throughput	250 Mbps	250Mbps	450 Mbps	450 Mbps
Maximum VPN Throughput	100 Mbps	100Mbps	200 Mbps	200 Mbps
Security Throughput	200 Mbps	200 Mbps	300 Mbps	300 Mbps
PoE Capabilities	No	Yes, 2x GbE RJ45 LAN Ports	No	Yes, 2x GbE RJ45 LAN Ports
Recommended LAN Clients	50	50	50	50

Technical Breakdown

WAN Interface

MX67 / W	MX67C	MX68 / W	MX68CW
1x Dedicated GbE RJ45 1x Convertible LAN GbE RJ45	1x Dedicated GbE RJ45 1x Convertible LAN GbE RJ45	2x Dedicated GbE RJ45	2x Dedicated GbE RJ45
Cellular Uplink via 3rd Party USB Modem	Built-in Cellular Uplink or 3rd Party USB Modem	Cellular Uplink via 3rd Party USB Modem	Built-in Cellular Uplink or 3rd Party USB Modem

LAN Interface

MX67 / C / W	MX68 / W / CW
3x Dedicated GbE RJ45	10x Dedicated GbE RJ45
1x Convertible LAN/WAN GbE RJ45	2x Dedicated GbE RJ45 PoE+

802.11 Wireless Interface

	MX67W	MX68W / CW
Radio Information	802.11a/b/g/n/ac Wave 2 (2.4 or 5Ghz) 2x2 MU-MIMO	802.11a/b/g/n/ac Wave 2 (2.4 or 5Ghz) 2x2 MU-MIMO
Antennas	2 x 2 MU-MIMO with two spatial streams	2 x 2 MU-MIMO with two spatial streams
Maximum Data Rate	1.3 Gbps	1.3 Gbps

NOTE: The MX68CW has fixed antennas that serve both 802.11 and LTE connectivity and cannot be removed.

Cellular Interface

Please note that any other worldwide carrier that requires only a GCF certification should be compatible.

	US / North America Bands	Worldwide Bands
HSPA+	2, 4, 5	1, 3, 5/6, 8
FDD-LTE	2, 4, 5(*), 12/17, 13, 29	1, 3, 7, 8, 20, 26/5, 28A, 28B
TDD-LTE	-	34, 39, 40, 41/38
TD-SCDMA Bands	-	34 (Band A), 39 (Band F)
GSM Bands	850, 900, 1800, 1900	900, 1800
CA	2xDL-CA up to 40Mhz: 2+17, 4+17, 2+29, 4+29, 4+5, 2+5	2xDL-CA up to 40Mhz: 3+20, 3+8, 7+20, 1+8, 1+5, 3+5
Certifications	PTCRB (US)	RCM (ANZ, APAC), GCF (EU)
Tested Carriers	Verizon, AT&T, Bell Canada, T-Mobile, Telus, Rogers	Orange, Telia, Telecom Italia, Telenor, Telefonica, Post, BT, STC, NTT docomo, Telstra, Optus, Spark NZ, Vodafone NZ, SingTel

Carrier compatibility is generally based on having compatible bands on the modem. In the open market, carriers may only require regulatory domain certifications and open market certifications, like the PTCRB and GCF, to be compatible for their network. Sometimes carriers will require additional testing before a device can be used on their network. The section Tested Carriers is based on Meraki device certifications being approved by those specific carriers. A carrier being listed above means that they have officially certified the Meraki product for their cellular network. There maybe many unlisted carriers could be functionally compatible with Meraki devices. The list of tested certified carriers is based on the carrier validating Meraki per their network parameter requirements. If a carrier you are looking to use is not listed above, it could be that they do not require additional compliance testing for their network.

Throughput and Capabilities

	MX67 / C / W	MX68 / W / CW
Recommended Maximum LAN Clients	50	50
Max Stateful Firewall Throughput in NAT mode	450 Mbps	450 Mbps
Max VPN Throughput	200 Mbps	200 Mbps
Max Concurrent VPN Tunnels (Site-to-Site or Client VPN)	50	50

Physical

	MX67	MX67W	MX67C	MX68	MX68W	MX68CW
Mount Type	Desktop / Wall Mount	Desktop / Wall Mount	Desktop / Wall Mount	Desktop / Wall Mount	Desktop / Wall Mount	Desktop / Wall Mount
Dimensions (h x d x w)	1.1 x 5.1 x 9.4 in / 27 x 130 x 239 mm	1.1 x 6.5 x 9.4 in / 27 x 164 x 239 mm	1.1 x 6.9 x 9.4 in / 27 x 176 x 239 mm	1.1 x 5.8 x 11.2 in / 27 x 148 x 284 mm	1.1 x 6.8 x 11.2 in / 27 x 172 x 284 mm	1.1 x 7.0 x 11.2 in / 27 x178 x 284 mm
Weight	1.74 lb / 0.79 kg	1.84 lb / 0.83 kg	1.87 lb / 0.85 kg	2.46 lb / 1.12 kg	2.55 lb / 1.16 kg	2.61 lb / 1.18 kg
Power Supply	18W DC	18W DC	18W DC	100W DC	100W DC	100W DC
Power Load (idle/ max)	5W / 14W	15W / 23W	6W / 17W	11W / 79W	19W / 87W	19W / 89W
Operating Temperature	32°F - 113°F 0°C - 45°C	32°F - 113°F 0°C - 45°C	32°F - 113°F 0°C - 45°C	32°F - 104 °F 0°C - 40°C	32°F - 104 °F 0°C - 40°C	32°F - 104 °F 0°C - 40°C
Humidity	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%

Accessories

Accessory	Description

MA-PWR-30WAC	Meraki MX Replacement Power Adapter (MX64, MX67) (30 Watts AC)
MA-PWR-90WAC	Meraki MX Replacement Power Adapter (MX65) (90 Watts AC)
MA-PWR-100WAC	Meraki MX Replacement Power Adapter (MX68 / 68W / 68CW) (100 Watts AC)
MA-ANT-MX	One pair of external dual-band dipole 802.11 antennas for MX64W / 65W / 67W / 68W (Connector type: RP-SMA)
MA-PWR-CORD-US	1x AC Power Cable, US plug
MA-PWR-CORD-EU	1x AC Power Cable, EU plug
MA-PWR-CORD-UK	1x AC Power Cable, UK plug
MA-PWR-CORD-AU	1x AC Power Cable, AU plug

NOTE: The MX68CW has fixed antennas that serve both 802.11 and LTE connectivity and cannot be removed.

Troubleshooting

Common Troubleshooting Steps

My cellular uplink is stuck at 'Connecting'

Built-in Cellular - Ensure the following:

- The SIM is activated with the PIN disabled or the correct PIN entered. It may be necessary to use an external modem, or work with the cellular provider to have the PIN disabled or the SIM unlocked.
- There is no external USB modem connected as the MX will prefer an external USB modem to the internal modem, if available.
- If a custom APN is needed, ensure it is applied from **Cellular** section of the **Uplink** tab on the **Security Appliance > Appliance Settings** page.
- The SIM card is fully inserted.

USB Cellular - Ensure the following:

- The USB Modem is activated and able to pass traffic when connected to a PC.
- If a custom APN is needed, ensure it is applied from the **Cellular** section of **Uplink** tab on the **Security Appliance > Appliance Settings** page.
- It is fully connected and powered on when connected to the MX.

My modem is connected but is getting very poor throughput

Meraki strongly recommends that the cellular uplink be used on a 4G connection with good signal strength to provide adequate bandwidth to support using the cellular connection as a backup uplink. If no 4G signal is available or the available signal is low strength, the achievable throughput may not be adequate to fully support a remote site and more restrictive traffic shaping rules should be used to ensure traffic is prioritized appropriately.

Common Event Log Messages

There are currently no MX67 / MX68 specific Event Log entries, for more general information about navigating the Event Log and the types of Events that could be expected please check out our Event Log documentation.

FAQ

Is the MX currently using the Cellular Uplink?

When the MX is using the Cellular Uplink it will display a Purple Status LED instead of the usual White LED.

Is this SD-WAN over LTE?

No.

Can LTE be used as the primary uplink?

No, LTE is currently only supported as a fail-over link and should only be primary during a temporary WAN failure event.

Can I utilize LTE for warm spare configuration?

No, LTE is not currently supported in a warm spare configuration. We recommend using either LTE failover on a single MX, or a warm spare configuration without LTE.

How does LTE work for free trials?

Meraki does not supply SIM cards so while the unit can be trialed, it is up to the end user to procure a working SIM card on a compatible carrier.

Do these models support eSIM capability?

No. Currently, Meraki customers will need to acquire a SIM card from their carrier and install.

Will the LTE devices be available in the USA and Worldwide?

Yes. There will be two models: a North American model and a Worldwide model

Should I contact Meraki Support for carrier issues?

No, you will need to bring support issues to the carrier for carrier issues.

How do I troubleshoot carrier issues?

The Meraki Dashboard provides the ability to monitor signal strength, performance, and historical traffic for troubleshooting purposes. For additional troubleshooting related to the carrier, the carrier will need to be contacted.

If an external USB cellular modem and the internal LTE SIM card are both connected, which one takes precedence?

The external USB cellular modem will take priority over the internal LTE SIM.

Can I change the APN?

Custom APNs can be configured from **Cellular** section of the **Uplink** tab on the **Security Appliance > Appliance Settings** page.

Can I change the antennas to improve my performance?

The MX68CW has fixed antennas for Wi-Fi and LTE that cannot be swapped. For the MX67C, only Meraki antennas are supported. Replacement antennas will be available for purchase.

If my antennae are lost or damaged, can I use 3rd party antennae that fit on the Meraki device?

Only the Meraki antennae are supported. Lost or malfunctioning antennae can be replaced by contacting Meraki support.

Why are the C and W models in the MX67 series separated whereas the MX68 has CW combined in one model?

The MX68CW provides a high-end option for customers who want all features included in one unit (wireless, high port count, PoE, cellular). The MX67, MX67C, MX67W are for customers who don't need all features in a single unit.

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MX Sizing Guide

APRIL 2020

This technical document provides guidelines for choosing the right Cisco Meraki security appliance based on real-world deployments, industry standard benchmarks and in-depth feature descriptions.

Overview

Cisco Meraki MX Security Appliances are Unified Threat Management (UTM) products. UTM products offer multiple security features in a simple-to-deploy, consolidated form factor. Given the number of security features that can be deployed in any given MX, device performance will vary depending on the use-case. Choosing the right MX depends on the use-case and the deployment characteristics.

This technical guide is designed to help answer the following questions:

- How do I decide which MX model I need?
- Which features should I turn on?
- How do MX models compare against the competition?

Choosing the right hardware

Cisco Meraki MX Appliances come in multiple models to satisfy a broad range of use cases. The chart below outlines MX hardware properties available under each family:

	MX64(W)	MX67(W/C)	MX68(W/CW)	MX84	MX100	MX250	MX450
							
Dual Wan Links	✓	✓	✓	✓	✓	✓	✓
3G / 4G Failover	✓	✓	✓	✓	✓	✓	✓
Built-In LTE Modem Model Available		✓	✓				
Built-In Wireless Available	✓	✓	✓				
Built-In PoE+ Model Available			✓				
Hard Drive				1TB	1TB	128GB (SSD)	128GB (SSD)
Fiber Connectivity				SFP	SFP	SFP, SFP+	SFP, SFP+
Dual Power Supply						✓	✓
Form Factor	Desktop	Desktop	Desktop	1U	1U	1U	1U

Network performance benchmarks

Industry standard benchmarks are designed to help you compare MX security appliances to firewalls from other vendors. These tests assume perfect network conditions with ideal traffic patterns. When measuring maximum throughput for a certain feature, all other features are disabled. Actual results in production networks will vary.

	MX64 series	MX67/68 series	MX84	MX100	MX250	MX450
Max throughput with all security features enabled	200 Mbps	300 Mbps	320 Mbps	650 Mbps	2 Gbps	4 Gbps
Max Stateful (L3) firewall throughput in passthrough mode	250 Mbps	450 Mbps	500 Mbps	750 Mbps	4 Gbps	6 Gbps
Max Stateful (L3) firewall throughput in NAT mode	200 Mbps	450 Mbps	500 Mbps	750 Mbps	4 Gbps	6 Gbps
Max site-to-site VPN throughput	100 Mbps	200 Mbps	250 Mbps	500 Mbps	1 Gbps	2 Gbps
Max concurrent site-to-site VPN tunnels [1]	50	50	100	250	3,000	5,000
Recommended maximum concurrent site-to-site VPN tunnels [2]	50	50	100	250	1,000	1,500
Recommended maximum concurrent client VPN tunnels	50	50	100	250	500[3]	500[3]
Max AMP throughput	250 Mbps	300 Mbps	500 Mbps	750 Mbps	2 Gbps	4 Gbps
Max IDS throughput	200 Mbps	300 Mbps	320 Mbps	650 Mbps	2 Gbps	4 Gbps

The SD-WAN feature set for the MX includes active-active VPN, which creates VPN tunnels between peers on all available uplinks in order to make the most efficient possible use of available WAN bandwidth. A connection between two peers can therefore contain up to four tunnels, depending on the number of MX uplinks at each site. This should be taken into consideration when making VPN sizing decisions.

[1] The maximum concurrent site-to-site VPN tunnels are based on lab testing scenarios where no client traffic is transferring over the VPN tunnels.

[2] Recommended concurrent site-to-site VPN tunnels are based on lab testing scenarios with client traffic transferring over VPN tunnels.

[3] More than 500 client VPN connections can be achieved, please refer to this guide.

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Features, benefits and performance impact

UTM products come with a variety of security and networking features. Understanding the benefits and tradeoffs of these features is crucial to getting the maximum security benefit without unnecessary performance degradation.

	BENEFITS	PERFORMANCE IMPACT	RECOMMENDATIONS
Malware protection	Blocks HTTP-based filed downloads based on the disposition received from the Cisco AMP cloud.	High	Consider disabling for guest VLANs and using firewall rules to isolate those VLANs. Also consider disabling if you run a full malware client like AMP for Endpoints on host devices.
IDS / IPS	Provides alerts / prevention for suspicious network traffic	High	Consider not sending IDS/IPS syslog data over VPN in low-bandwidth networks.
VPN	Secure, encrypted traffic between locations	Medium	Use split-tunnel VPN and deploy security services at the edge.
Web caching	Accelerating access to Web content by caching locally	Medium	Ideal for repetitively accessing heavy multimedia content frequently for low bandwidth networks. Not recommended for high bandwidth networks. Please note that YouTube doesn't support web caching.
Content filtering (top sites)	Category based URL filtering using locally downloaded database	Low	Choose this option if your priority is speed over coverage.
Content filtering (full list)	Category based URL filtering using the full database hosted at Brightcloud.com	Medium	Choose this option if your priority is 100% coverage and security. Web browsing will be slightly slower at the beginning but will improve as more and more URL categories are cached.
Web safe-search	Turning Google / Bing safe-search option on	Low	Must be deployed in tandem with "disable encrypted search" option to be effective.
Blocking encrypted search	Disabling Google / Bing searches via https (port 443), allowing Web safe-search enforcement	Low	Must be deployed in tandem with "Web safe-search" to be effective. Requires a DNS setting modification, otherwise will also break Google apps. Check Meraki knowledge base for further information.

Client recommendations

Although there is no hard limit on the number of client devices that can be deployed below MX Security Appliances, for purposes of this document all tests were performed with the client counts shown in the table below. Exceeding these client counts may result in performance that varies from the sizing data contained in this guide.

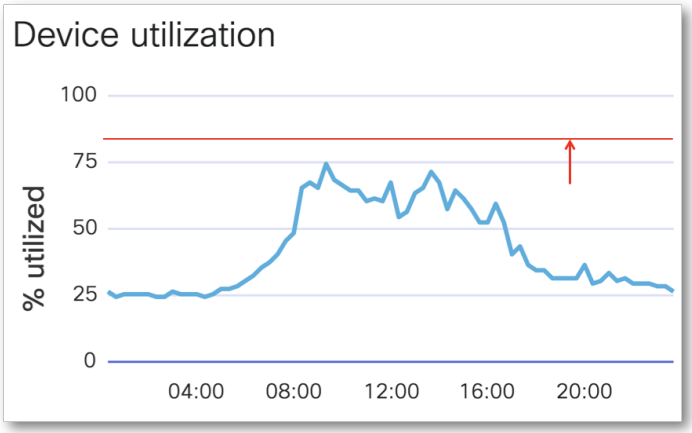
RECOMMENDED NUMBER OF CLIENT DEVICES

	MX64 series	MX67/68 series	MX84	MX100	MX250	MX450
Recommended client devices	50	50	200	500	2,000	10,000

Built-in MX Device utilization

This guide aims to educate the user on the expected utilization and load levels for specific MX models with certain features enabled. However, to accurately predict the load on the device, it must be tested in its designated environment, under expected conditions. There are a large number of variables in each individual network that will affect real-world performance, such as the unique traffic blend and the features in use.

MX Device utilization helps provide a better understanding of the device's load over time and can be used to assess the utilization level and whether a higher end device or a load reduction is required.If an MX device is consistently over 85% utilization during normal operation*, upgrading to a higher throughput model or reducing the per device load should be considered. The MX Device utilization tool is available through an API or as a graph shown on the Summary Report page.



MX Device utilization calculation

The device utilization data reported to the Meraki Dashboard is based on a load average measured over a period of one minute. The load value is returned in numeric value ranging from 1 through 100. A lower value indicates a lower load, and a higher value indicates a more intense workload. Currently, the device utilization value is calculated based upon the CPU utilization of the MX as well as its traffic load.

Due to load averaging, it's possible for transient load spikes to occur without being visible in the utilization metric. For example, a device load that is consistently shown as less than 85% may still be experiencing transient load spikes. These transient load spikes may cause packets received in excess of the device's forwarding capacity to be dropped.

** With all the desired features turned on, the expected number of clients connected, and the expected traffic mix traversing the device.*

Conclusion

While every network will have a unique traffic pattern, this guide highlights a few common scenarios to help you choose the right Cisco Meraki MX product for your environment. Consider planning for future growth by allocating buffer room in your firewall selection (e.g., if you currently have 550 users, choose an MX that supports 1000 users). This will ensure that you can continue enabling additional security and network features as they become available. Also considering ISP speeds are increasing year over year, it is important to choose a firewall that will serve you well over many years.

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