



WHITEPAPER

Support Sustainability in IT With Cisco Meraki Switching

Discover, act, and report progress
toward sustainability goals





Table of contents

Introduction	3
Make your switches the control hub for energy savings	4
Design for optimal efficiency	5
Discover opportunities with insights	6
Act on and scale the outcomes	9
Report the results	12
Help reduce your carbon footprint with remote troubleshooting	13
Building toward an energy-efficient future	15

Introduction

In today's economic climate, you're looking for new ways to save your organization money and reduce the operating expenses of your IT networks. It's likely you are also prioritizing sustainability to improve your company's brand image, ensure regulatory compliance, and maximize efficiencies for resources like energy. As the world becomes more connected, technologies like cloud, artificial intelligence (AI), and networking create new opportunities to enable a sustainable future.

A business that can easily and intelligently control network devices can generate cost savings that extend beyond the ticket price paid for the original technology purchase. Businesses can also realize benefits such as improved building security and supporting an employee culture for environmental responsibility.

Given their integral function in connectivity, switches play a vital role in advancing sustainability and energy savings goals.





Make your switches the control hub for energy savings

Increasing the energy efficiency of IT operations can be achieved by focusing on the network edge, which includes devices such as IP phones, digital signage, wireless access points (like Meraki MR), and other Power over Ethernet (PoE) or network access devices. For maximum efficiency, a powerful, easy-to-use, and centrally managed platform is key.

The Meraki cloud platform enables IT organizations of any size to rapidly deploy energy-saving policies across the entire network edge using a browser-based interface—without needing additional hardware or training. Because provisioning, troubleshooting, and remediation can be done remotely and centrally, Meraki solutions help reduce travel needs, associated costs, and carbon footprint, since organizations no longer need to send experts off-site for every deployment or troubleshooting activity.

IT professionals can help cut their organizations' travel costs and carbon footprint with Meraki.

Design for optimal efficiency

Meraki is committed to continually innovating to improve the sustainability of our products, and our versatile accessory designs allow you to choose the right solution for deployment. Here are a few examples to consider:

- Keep switches cool with fanless passive cooling—perfect for small/quiet environments
- Reduce downtime risk and prevent complete system failover with modular design options
- Help minimize waste through platform reuse by swapping out failed components
- Increase visibility and reduce energy conversion loss with PoE for centralized energy management
- Leverage platinum-rated power supply options, available on select models

Our paper-based outer packaging is composed of 70% recycled material and 30% responsibly managed Forest Stewardship Council-certified forests.

If you have Meraki products that have reached end of use, you can request a no-cost pickup for your return [here](#).



Paper-based packaging design keeps our products safe on their journey to you while minimizing the impact on the environment.



Discover opportunities with insights

Identifying opportunities for energy optimization is often a manual process, especially when you need to find opportunities at scale across hundreds or thousands of locations.

Know your network utilization

With built-in application and endpoint-layer visibility, your team has better end-to-end understanding of the entire network, which helps enhance and simplify network-resource optimization.

Understand your power usage

Real-time and historical power consumption reporting is also directly available in the Meraki dashboard. This provides deep visibility into the power that every Power over Ethernet port consumes over a specified period and also collectively by the entire network or organization. You can even view switches by top power consumption.

Active PoE ports

Per-port live PoE statistics

Closet 3.2.2
MS350-48FP 0c:8d:db:b8:8cb2

Summary | **Ports** | Power | L3 routing | Event log | Location | Tools

Ports | View ports on this switch

Port#	Module	Name	Aggregation Group	Type	VLAN	Current traffic Sent ↓, Received ↑	Total bytes	RSTP	PoE usage	CDP/LLDP	Link	Status
21				trunk	native 180	1.6 Mbps (1.4 Mbps ↓, 241.8 Kbps ↑)	4.05 GB	Forwarding	8.9 W (Advertised 30 W)	Meraki MR56 - SFO12-3-AP01 / 0	Auto negotiate (1 Gbps)	
22				trunk	native 180	209.0 Kbps (196.3 Kbps ↓, 12.7 Kbps ↑)	1.45 GB	Forwarding	9 W (Advertised 30 W)	Meraki MR56 - SFO12-3-AP04 / 0	Auto negotiate (1 Gbps)	
23				trunk	native 180	-	-	Enabled	-		Auto negotiate	
24		Legacy AP		trunk	native 180	-	-	Enabled	-		Auto negotiate	
25				trunk	native 180	363.5 Kbps (347.0 Kbps ↓, 16.5 Kbps ↑)	2.77 GB	Forwarding	9.1 W (Advertised 30 W)	Meraki MR56 - SFO12-3-AP09 / 0	Auto negotiate (1 Gbps)	
26				trunk	native 180	311.2 Kbps (267.5 Kbps ↓, 43.8 Kbps ↑)	4.44 GB	Forwarding	8.9 W (Advertised 30 W)	Meraki MR56 - SFO12-3-AP06 / 0	Auto negotiate (1 Gbps)	
27				trunk	native 180	-	-	Enabled	-		Auto negotiate	
28				trunk	native 180	-	-	Enabled	-		Auto negotiate	
29				trunk	native 180	243.2 Kbps (210.1 Kbps ↓, 33.1 Kbps ↑)	2.45 GB	Forwarding	8.7 W (Advertised 30 W)	Meraki MR56 - SFO12-3-AP10 / 0	Auto negotiate (1 Gbps)	
30		Legacy AP		trunk	native 180	-	-	Enabled	-		Auto negotiate	

10 results per page

PoE devices are becoming more prominent as businesses adopt new technologies to champion efficiency. This creates additional opportunities for cost savings by reducing off-hour energy consumption.

Meraki switches add several intelligent features to your network for monitoring power draw. The Meraki cloud displays PoE information on a per-port, network, and organization basis. With flexible historic views, you can quickly analyze to determine how much power PoE devices consumed over the last two hours or see a summary of the past 30 days.

Additionally, Meraki switches perform intelligent PoE budget allocation by analyzing discovery protocols for device-advertised power requirements. This means your PoE switch budget is more efficient across all interfaces.



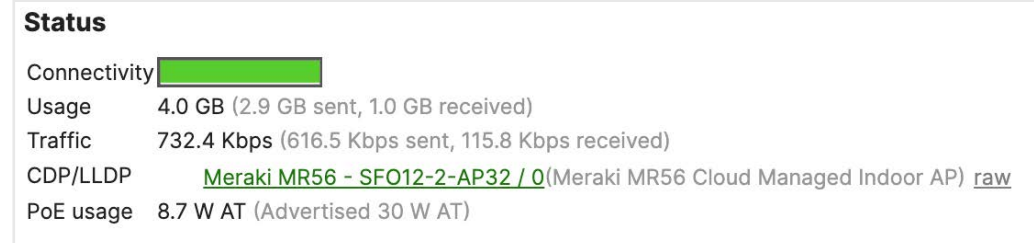
Top switches by power usage

Name	Model	Power usage
Closet 4.2.9	MS250-48FP	18.4 kWh
Closet 2.2.17	MS350-48FP	16.5 kWh
Closet 8.1.6	MS350-48FP	6.68 kWh
Closet 1.1.2	MS350-48FP	5.48 kWh
SFO12-5-3-SW1-WIFI	MS355-48X2	5.45 kWh
SFO12-4.1-SW1-WIFI	MS355-48X2	5.32 kWh
SFO12-5-2-SW1-WIFI	MS355-48X2	5.13 kWh
Corp WiFi 7.1-1	MS390-48UX2	4.42 kWh
Switch 21-8	MS350-48FP	4.11 kWh
Switch 19-5	MS350-48FP	4.08 kWh

Act on and scale the outcomes

Smart power budgeting

The Meraki dashboard gives detailed, real-time statistics about your PoE devices and overall switch power usage. With discovery protocols, the switch will find—and only allocate—the advertised power amount per device. This adds efficiency to per-port power budget allocation and also provides IT administrators with detailed power consumption information.



Real-time statistics on PoE devices power budget and usage.

Powering down inactive devices in quiet and out-of-business hours can be a time-consuming task—and often requires dedicated on-site IT personnel.

Port scheduling

With Meraki, the port scheduling feature allows you to define one or more weekly recurring schedules that IT can apply to selected switch ports within your network. For example, a typical office building may have an 8 am to 6 pm operating schedule, so the IT team can create a new port schedule, as shown on the right.

Configurable within minutes, this port schedule can add significant cost savings for the life of the deployment and provide additional security in the building during off hours. Don't forget to turn on [muting notifications](#) based on switch port schedules to avoid unnecessary alerts so you can focus on what is important.

Port schedules

Local time zone: America - Los Angeles (You can set this on [General](#))

Energy Savings used by 1 port

Templates: 8 to 5 daily | 8 to 5 on weekdays only | weekdays only | always on | always off

Day	Status	During	Time display: 24 Hour AM/PM
Monday	enabled	8:00 17:00	0:00 4:00 8:00 12:00 16:00 20:00
Tuesday	enabled	8:00 17:00	0:00 4:00 8:00 12:00 16:00 20:00
Wednesday	enabled	8:00 17:00	0:00 4:00 8:00 12:00 16:00 20:00
Thursday	enabled	8:00 17:00	0:00 4:00 8:00 12:00 16:00 20:00
Friday	enabled	8:00 17:00	0:00 4:00 8:00 12:00 16:00 20:00
Saturday	enabled	8:00 17:00	0:00 4:00 8:00 12:00 16:00 20:00
Sunday	enabled	8:00 17:00	0:00 4:00 8:00 12:00 16:00 20:00

[Add a new port schedule](#)

Alerts Settings

Default recipients: All network admins x

Network-wide

- Configuration settings are changed
- A VPN connection comes up or goes down
- A rogue AP is detected
- Network usage exceeds 100
- Mute wireless alerts based on switch port schedules

If toggled on, then wireless unreachable alerts will be muted when caused by a port schedule. [Learn more](#)



Did you know?

Powering off 1,000 PoE devices (10 W) for 12 hours per day can lead to 50% energy savings or ~43,800 kWh energy / ~\$7,095 cost (\$0.162 per kWh) / ~16.5 metric tonnes CO2 emissions* savings per year.

*Based on internal analysis. Actual estimate varies depending on the location where the devices are operated.

Adding energy-saving policies directly to access devices and endpoints can significantly save energy. However, sometimes you may need to remotely wake or access a device that is in a low-power state for tasks such as installing software updates on cash registers in retail stores. You can send wake-on-LAN (WOL) packets directly via the Meraki dashboard from any Meraki switch. We recently added WOL capabilities to our API, allowing you to account for high-scale and automated applications.

802.1X Control Direction (wake-on-LAN support)

802.1X Control Direction allows administrators to accomplish this. This tool enables organizations to be sustainable, yet also wake—and gain network access to—devices on standby.

This feature works via an API in the Meraki dashboard within template networks. As a bonus, switch access policies in template networks are now configurable via the API.

Host Mode ⓘ	Single-Host ▼
Access policy type ⓘ	802.1X ▼
802.1X Control Direction ⓘ	inbound-only ▼

Set Control Direction as “inbound-only”

Configuration ✎	
Port status	Enabled
Type	Access
VLAN	30
Voice VLAN	--
Access policy	802.1X Policy (inbound-only) ⓘ
Link negotiation	Auto negotiate
RSTP	Enabled
Port schedule	Unscheduled

Control Direction is enabled as part of switch access policy configuration.

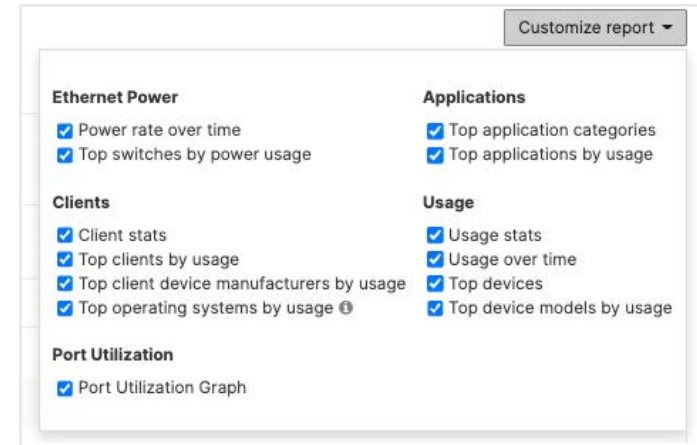
Report the results

You've made changes with the environment in mind, so having a trusted source for reporting the results of these steps is critical. As the control hub of a sustainable IT initiative, Meraki cloud-managed switches leverage the power rate over time and various reports to find opportunities to achieve energy savings. This approach also helps quantify savings and document progress toward sustainability goals.

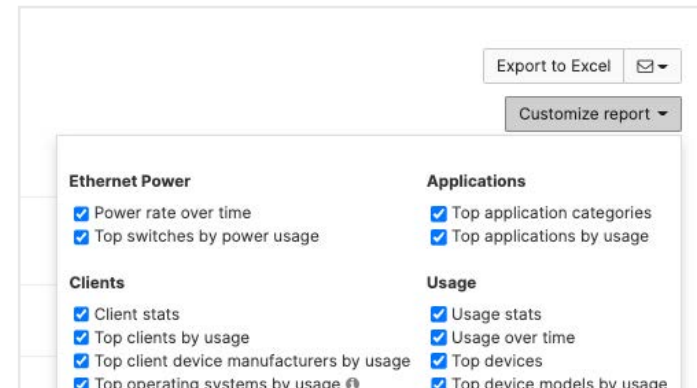


Did you know?

The Cisco Meraki [MT40 smart power controller](#) helps power on/off non-PoE devices as well as measure and report their power consumption after implementing energy-saving measures.



Customize the report page and/or export the report.

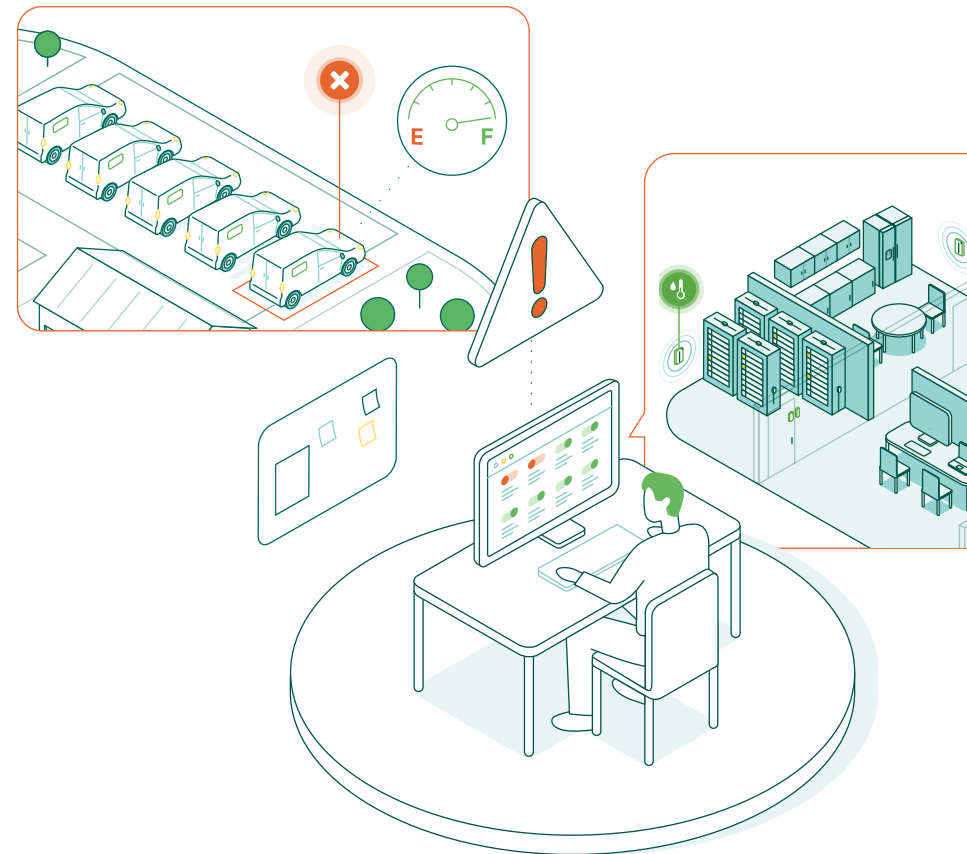


Power usage graph after applying port scheduling.

Help reduce your carbon footprint with remote troubleshooting

By leveraging the powerful remote management and monitoring capabilities of the Cisco Meraki cloud-managed platform, your company can help reduce its carbon footprint by minimizing travel, applying proactive monitoring, and performing remote updates and maintenance. These remote capabilities can also help reduce network downtime risks associated with delayed troubleshooting and remediation.

We recommend that IT teams document their travel efforts before migrating to the Meraki platform so that they can quantify and demonstrate the travel (and therefore emissions) reductions they were able to achieve after the migration. We frequently hear from our customers that migrating to the Meraki platform made significant reductions possible.



Live tools—cable test and packet capture

With an integrated [cable test](#) tool, network administrators can quickly identify cable faults and connectivity issues remotely. The tool can be used proactively to monitor the health of cables and detect potential issues before they cause disruptions or delay refresh deployment projects.

The remote [packet capture](#) tool allows your team to capture packets quickly and easily on one or multiple ports for further analysis. The tool provides valuable insights into network behavior, helps identify network bottlenecks, detects potential security threats, and assists in diagnosing and resolving network issues.

Packet capture for security appliances ▼

Security appliance:

Interface:

Output:

Duration (secs):

Verbosity:

Ignore: broadcast packets multicast packets

Filter expression:

[clear output](#) or

Sample filter expressions

host 10.1.27.253
packets to and from ip address 10.1.27.253

host 10.1.27.253 and port 53
packets to and from ip address 10.1.27.253 and TCP or UDP port 53 (DNS)

icmp[icmptype] != icmp-echo and icmp[icmptype] != icmp-echo-reply
all ICMP packets that are not echo requests/replies (i.e., not ping packets);

ether host 11:22:33:44:55:66
packets to and from ethernet host 11:22:33:44:55:66

See more [examples](#).

The maximum packet capture duration is 1200 seconds.
This capture will stop after 60 seconds, or when 5000 packets have been captured.

[Packet capture logs](#)

Suggested fix: Match VLAN configuration

The recommendation is to match the VLAN settings from standalone 2 / 1/MA-MOD-4X10G/A.

[Change log](#)

Port	31	1/MA-MOD-4X10G/4
Device	MS425	standalone 2
Type	Trunk	Trunk
Native VLAN	1	1
Allowed VLANs	1-1000	1-999 Suggested



Did you know?

The Meraki dashboard automatically detects misconfigurations. You can remediate VLAN mismatches with a single click.

Building toward an energy-efficient future

As more organizations make climate action pledges for sustainable futures, IT can be at the forefront of driving sustainability innovations with technologies.

Technology can help lead the sustainable way for organizations to achieve their goals. With an intuitive, data-defined platform and savvily designed switches, Meraki helps you optimize your company's network performance, uptime, and security while championing sustainability.



Green-light Meraki cloud-managed switches to take further steps on your sustainability journey.

[Learn more](#)

Visit the [Cisco ESG reporting hub](#) to learn more about our purpose and our progress.