

CISCO *Live!*



#CiscoLive



The bridge to possible

Meraki 101 – Introduction to Meraki Integrations

Shweta Palande

Technical Marketing Engineer

@ShwetaPalande

DEVNET-1332



#CiscoLive

Cisco Webex App

Questions?

Use Cisco Webex App to chat with the speaker after the session

How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until June 17, 2022.



<https://ciscolive.ciscoevents.com/ciscolivebot/#DEVNET-2177>



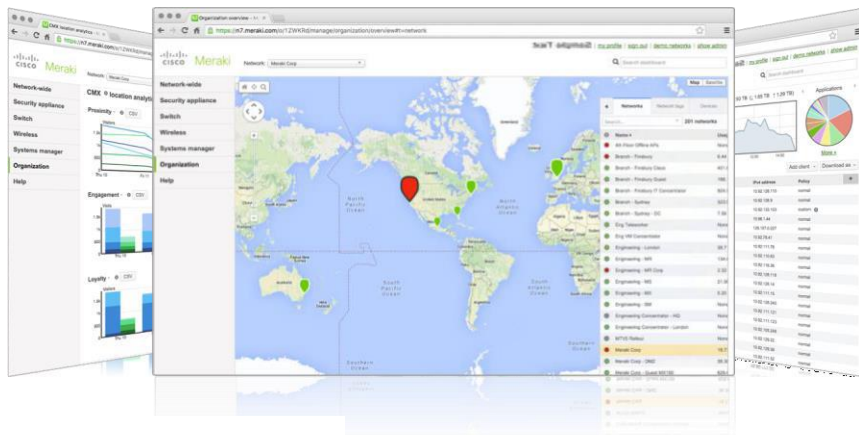
Agenda

- The Meraki Platform
- Meraki APIs
- Dashboard API
- WebHook Alerts
- Location Scanning API
- MV Sense (Cameras)
- External Captive Portal (EXCAP)
- Wrap Up

The Meraki Platform



Meraki – Cloud Management for the Enterprise



MR Wireless



MX Security Appliances



MS Switches



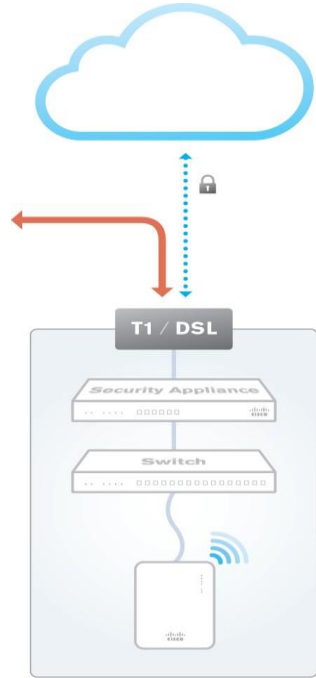
SM
EMM/MDM



MV Camera

CLOUD MANAGED IT

Brings the benefits of cloud to enterprise networks



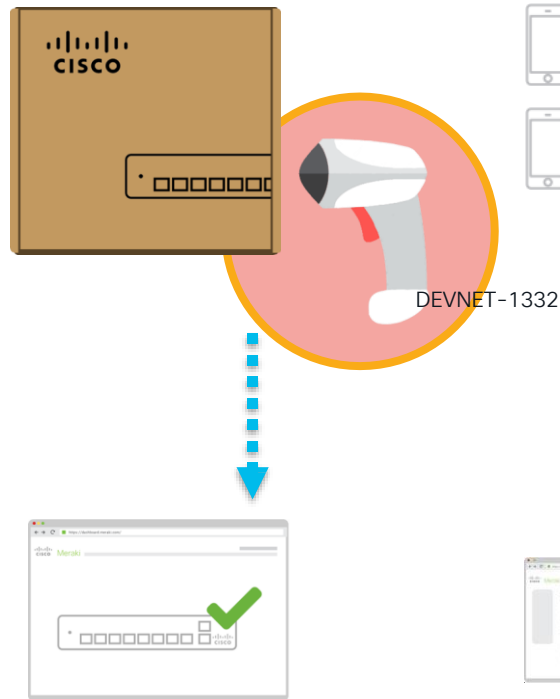
- Secure
 - No user traffic passes through the cloud
 - Fully HIPAA / PCI Compliant (level 1 certified)
 - 3rd party security audits, daily vulnerability testing
 - Automatic firmware and security updates (user-scheduled)
- Scalable
 - Unlimited throughput, no bottlenecks
 - Add devices or sites in minutes
- Reliable
 - Highly available cloud with multiple datacenters
 - Network functions even if connection to cloud is interrupted
 - 99.99% uptime SLA
 - Reliability and security information at meraki.cisco.com/trust

Meraki APIs

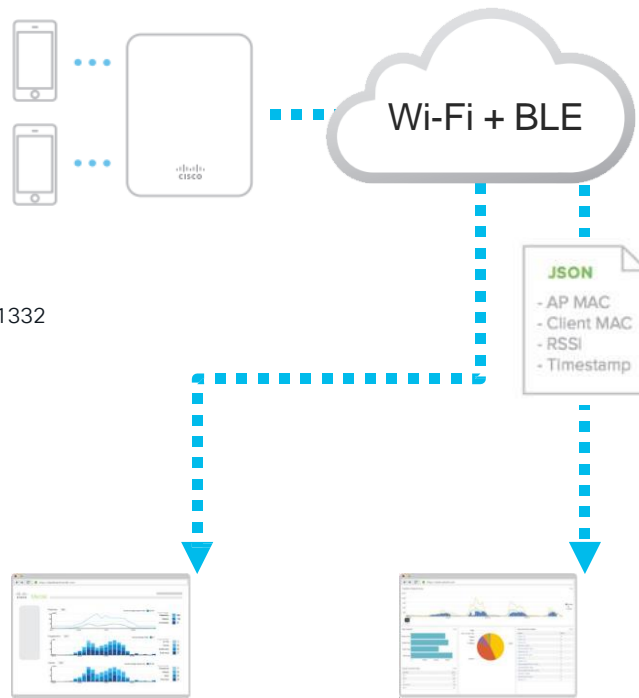


Meraki APIs

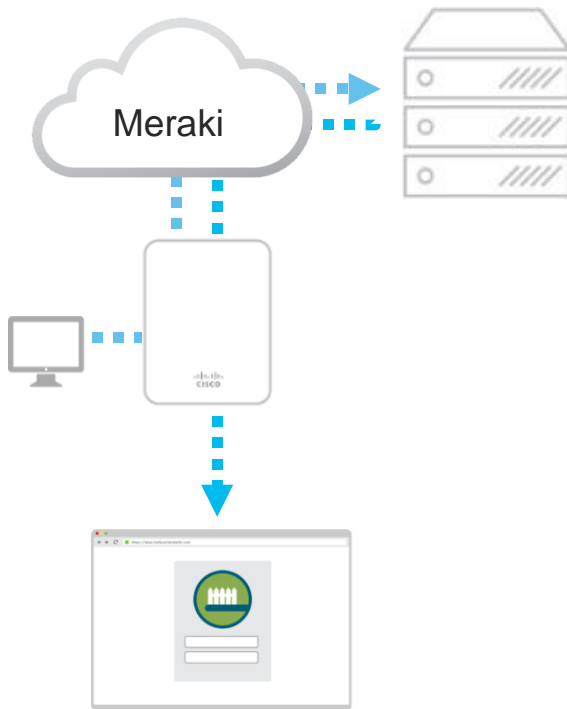
Dashboard API



Scanning API

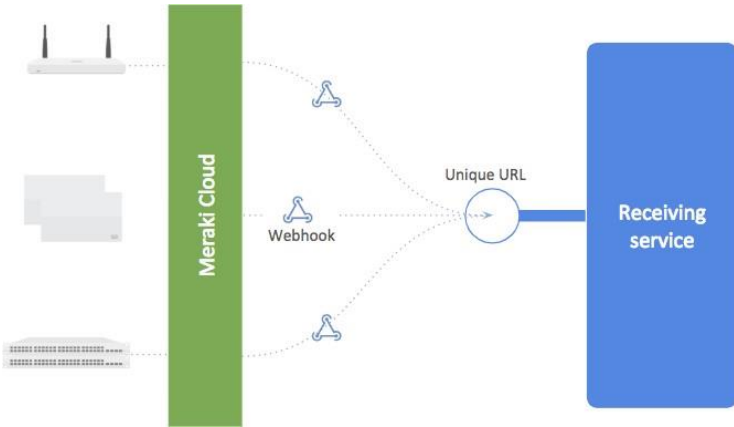


Captive Portal API

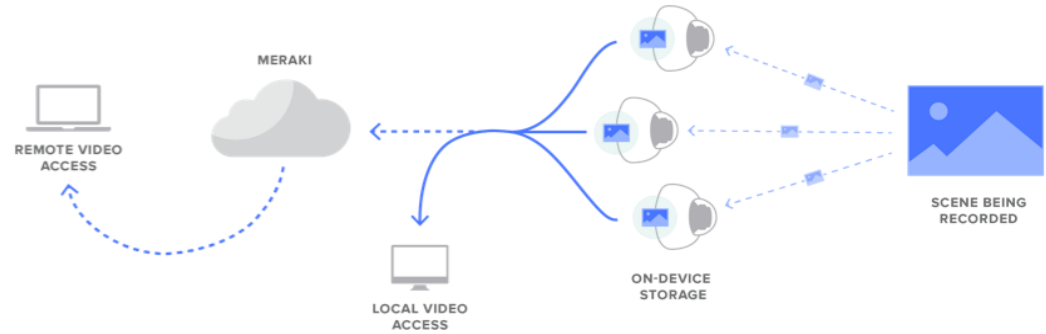


Meraki APIs - Continued

WebHook Alerts



MV Sense



Meraki Dashboard API



What is possible with the Dashboard API?

Network Programmability and Automation

- Provisioning – Set up 10k networks across 5 time zones
- Configuration Management – make a configuration change to 1,100 ports
- Monitoring – connection status of all 2000 Meraki devices in the organization.

Data insights and analysis

- Reporting – visualize what % of clients are on WIFI vs wired

Enabling the Dashboard API

API access

API keys

Key	Created at	Last used	
*****0327	Jul 12 2018 20:36 UTC	May 21 2019 15:02 UTC	Revoke

Generate new API key

1. Organization > Settings > Enable API access
2. Go to My profile and Generate API key.
3. Go to <https://developer.cisco.com/meraki/api/#/rest/getting-started>
4. Check meraki interactive API documentation – <https://developer.cisco.com/meraki/api-v1/>

Provisioning New Networks

- POST /organizations/{organizationId}/networks -> Network name, type
- Take the resulting networkId and
- POST /networks/{networkId}/devices/claim with device serial body

Hardening the newly provisioned network

- Segment with VLANs - POST /networks/{networkId}/vlangs
- Content Filtering - PUT /networks/{networkId}/contentFiltering
- Group Policies - POST /networks/{networkId}/groupPolicies
- Network Malware Settings - PUT /networks/{networkId}/security/malwareSettings
- Firewallled Services - PUT /networks/{networkId}/firewallledServices/{service}
- MX L7 Firewall Rules - PUT /networks/{networkId}/l7FirewallRules
- MX L3 Firewall Rules - PUT /networks/{networkId}/l3FirewallRules
- MR L3 Firewall Rules - PUT /networks/{networkId}/ssids/{number}/l3FirewallRules
- Switchport Management - PUT /devices/{serial}/switchPorts/{number}

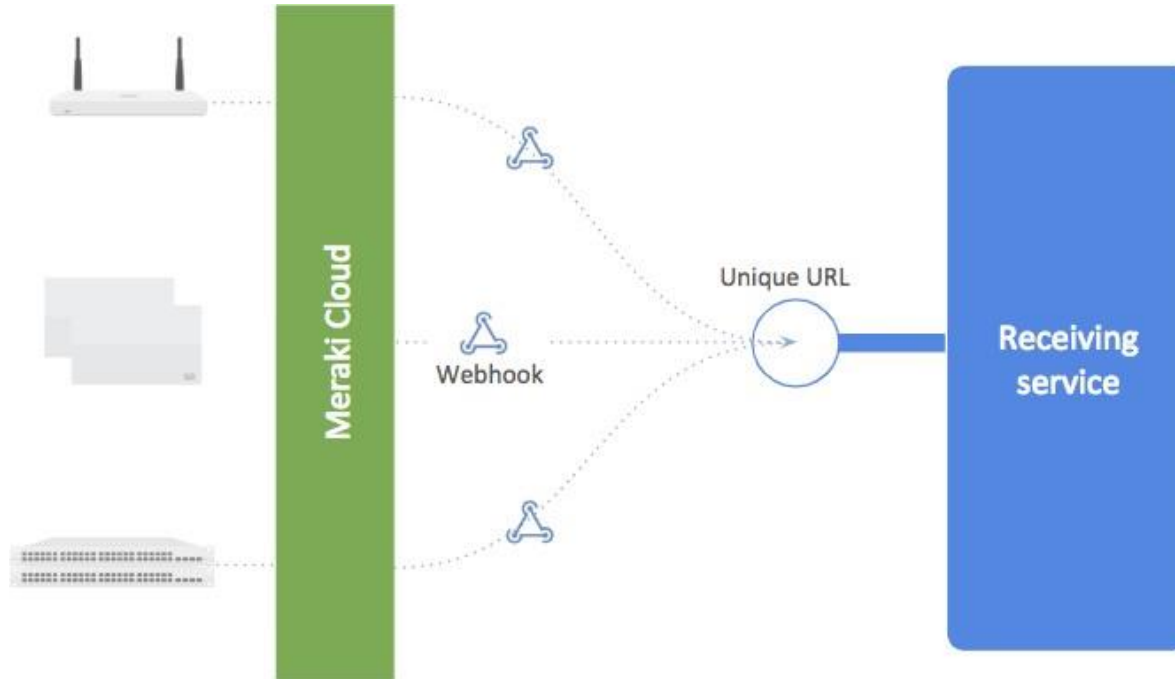
Monitoring the network

- Client level
 - GET /networks/{networkId}/clients/{clientId}/securityEvents
 - GET /networks/{networkId}/clients/{idOrMacOrIp}/events
 - GET /networks/{networkId}/clients/{idOrMacOrIp}
- Network level
 - GET /networks/{networkId}/devices/{serial}/lossAndLatencyHistory
 - GET /networks/{networkId}/airMarshal
 - GET /networks/{networkId}/traffic
 - GET /networks/{id}/splashLoginAttempts
 - GET /networks/{networkId}/clients/connectionStats
 - GET /networks/{networkId}/clients/latencyStats

Webhook Alerts



WebHook Alerts



Example WebHook Integrations and Solutions

Generate alarms or events in your monitoring or management system

solarwinds

pagerduty



zendesk

servicenow

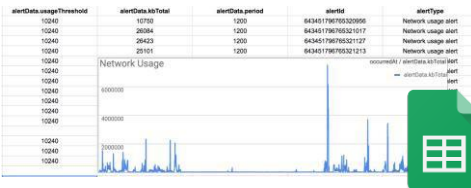
Automate workflows based on network events

```
{
  "alertId": "643451796765250686",
  "alertType": "A switch port was disconnected",
  "deviceMac": "00:11:22:33:44:55",
  "deviceName": "Office",
  "deviceSerial": "AAAA-BBBB-CCCC"
}
```



Webex Teams

Log alerts to a spreadsheet for interactive and flexible reporting

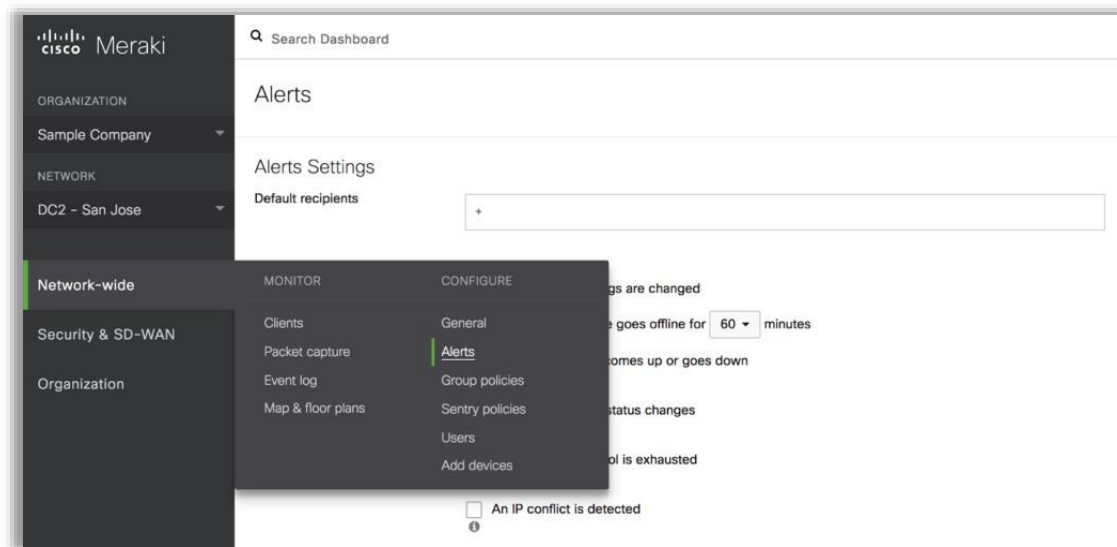


Configuring Meraki Alerts

Login to the the [Meraki Dashboard](#).

Select the Organization and Network you wish to work with and select the Alerts menu.

Network-wide → Alerts



Configuring Meraki Alerts

Add a New HTTP Server

Webhooks ⓘ

HTTP servers

Name	URL	Shared secret	Payload template	Webhook tests
<input type="text"/>	<input type="text"/>	<input type="text"/>	Meraki (included)	Send test webhook x

Add an HTTP server

SNMP traps ⓘ

Access Disabled

Cancel

(Please allow 1-2 minutes for changes to take effect.)

Assign the server as a recipient

Alerts Settings

Default recipients

Webhook: PagerDuty x +

Select your alerts.

Security appliance

- ☐ Configuration settings are changed
- ☒ A security appliance goes offline for 5 minutes
 - Show additional recipients
- ☐ A VPN connection comes up or goes down ⓘ
- ☐ The primary uplink status changes ⓘ
- ☒ The DHCP lease pool is exhausted ⓘ
 - Show additional recipients
- ☐ An IP conflict is detected ⓘ
- ☒ Cellular connection state changes ⓘ

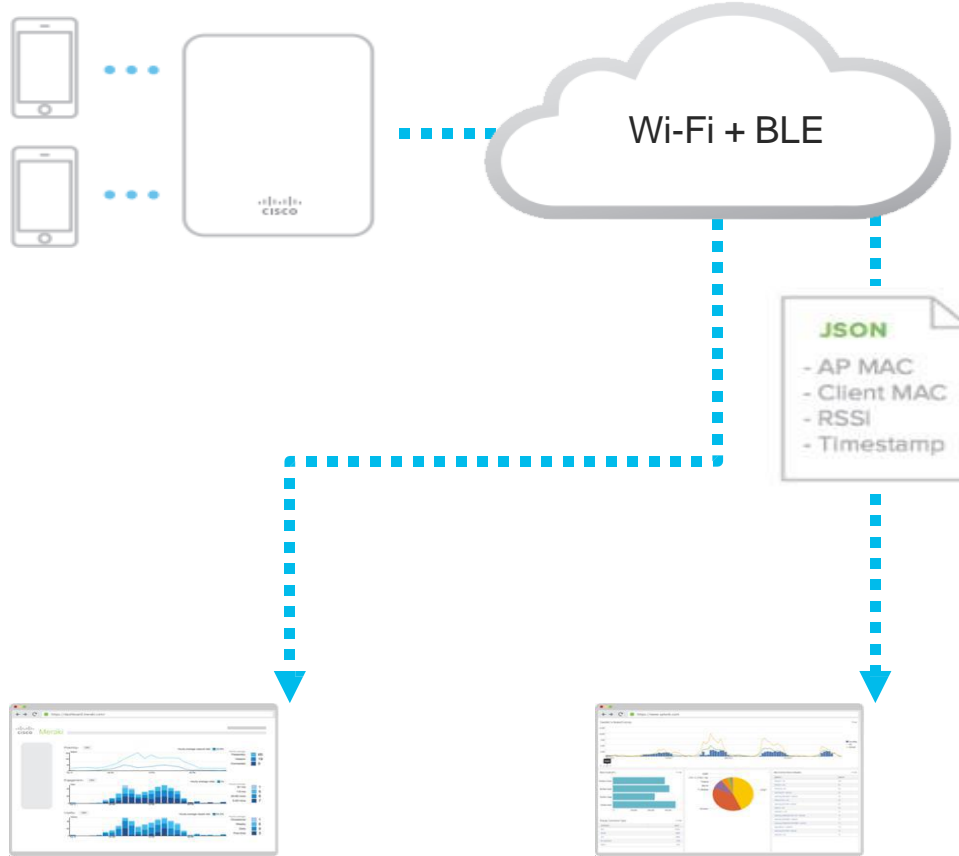
Webhook Custom Templates

- Custom Payload Templates enable the webhook data to be shaped as desired and sent directly to the destination API, without any additional services in between.
- The payload template will shape the headers and body of the Meraki webhook using the [Liquid](#) template language, allowing access to the alert variables and additional formatting options.
- Webhook setup guide - <https://developer.cisco.com/meraki/webhooks/#!meraki-included/meraki>

Location Scanning



Location Scanning API



```
{  
  "apMac": <string>,  
  "apTags": [<string>, ...],  
  "apFloors": [<string>, ...],  
  "observations": [  
    {  
      "clientMac": <string>,  
      "ipv4": <string>,  
      "ipv6": <string>,  
      "seenTime": <string>,  
      "seenEpoch": <integer>,  
      "ssid": <string>,  
      "rssi": <integer>,  
      "manufacturer": <string>,  
      "os": <string>,  
      "location": {  
        "lat": <decimal>,  
        "lng": <decimal>,  
        "unc": <decimal>,  
        "x": [<decimal>, ...],  
        "y": [<decimal>, ...]  
      },  
    },  
    ...  
  ]  
}
```


Dashboard Configuration and API Flow

Analytics Analytics enabled

CMX API CMX API enabled

Validator ⓘ `fffffffffjsdkfjsdalkfhsda868c4c25b9d6325035f5`

Validated `http://mysite-zzz.dynamic-m.com:1880/cm2`

Post URLs ⓘ

Post URL	Secret	API Version		
<code>http://mysite-zzz.dynamic-m.com:1880/cm2</code> Show secret	2.0	Validate	X

POST URL

`https://YourServer.com`

[GET]

YourServer responds with the **Validator** key defined by your Meraki Dashboard network.

[POST]

YourServer receives a JSON array of client observations, which includes a user defined **Secret** that can be used to ensure the integrity of the data.

Wi-Fi Location Scanning Elements

Name	Format	Description
apMac	string	MAC address of the observing AP
apTags	[string]	JSON array of all tags applied to the AP in dashboard
apFloors	[string]	JSON array of all floorplan names on which this AP appears
clientMac	string	Device MAC
ipv4	string	Client IPv4 address and hostname, in "hostname/address" format; only "/address" if no hostname, null if not available
ipv6	string	Client IPv6 address and hostname, in "hostname/address" format; only "/address" if no hostname, null if not available
seenTime	ISO 8601 date string	Observation time in UTC; example: "1970-01-01T00:00:00Z"
seenEpoch	integer	Observation time in seconds since the UNIX epoch
ssid	string	Client SSID name; null if the device is not connected
rssi	integer	Device RSSI as seen by AP
manufacturer	string	Device manufacturer; null if manufacturer could not be determined
os	string	Device operating system; null if the OS could not be determined
location	location	Device geolocation; null if location could not be determined
lat	decimal	Device latitude in degrees N of the equator
lng	decimal	Device longitude in degrees E of the prime meridian
unc	decimal	Uncertainty in meters
x	[decimal]	JSON array of x offsets (in meters) from lower-left corner of each floorplan
y	[decimal]	JSON array of y offsets (in meters) from lower-left corner of each floorplan

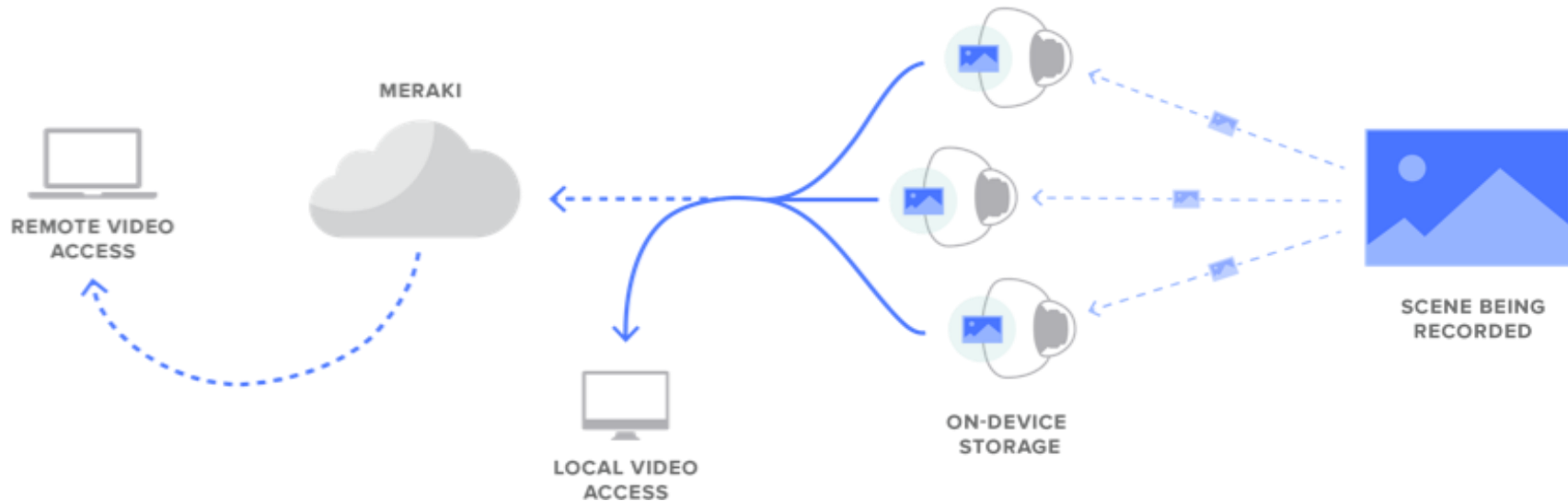
Bluetooth Scanning Elements

Name	Format	Description
apMac	string	MAC address of the observing AP
apTags	[string]	JSON array of all tags applied to the AP in dashboard
apFloors	[string]	JSON array of all floorplan names on which this AP appears
clientMac	string	Device MAC
seenTime	ISO 8601 date string	Observation time in UTC; example: "1970-01-01T00:00:00Z"
seenEpoch	integer	Observation time in seconds since the UNIX epoch
rssI	integer	Device RSSI as seen by AP
location	location	Device geolocation; null if location could not be determined
lat	decimal	Device latitude in degrees N of the equator
lng	decimal	Device longitude in degrees E of the prime meridian
unc	decimal	Uncertainty in meters
x	[decimal]	JSON array of x offsets (in meters) from lower-left corner of each floorplan
y	[decimal]	JSON array of y offsets (in meters) from lower-left corner of each floorplan

MV Sense



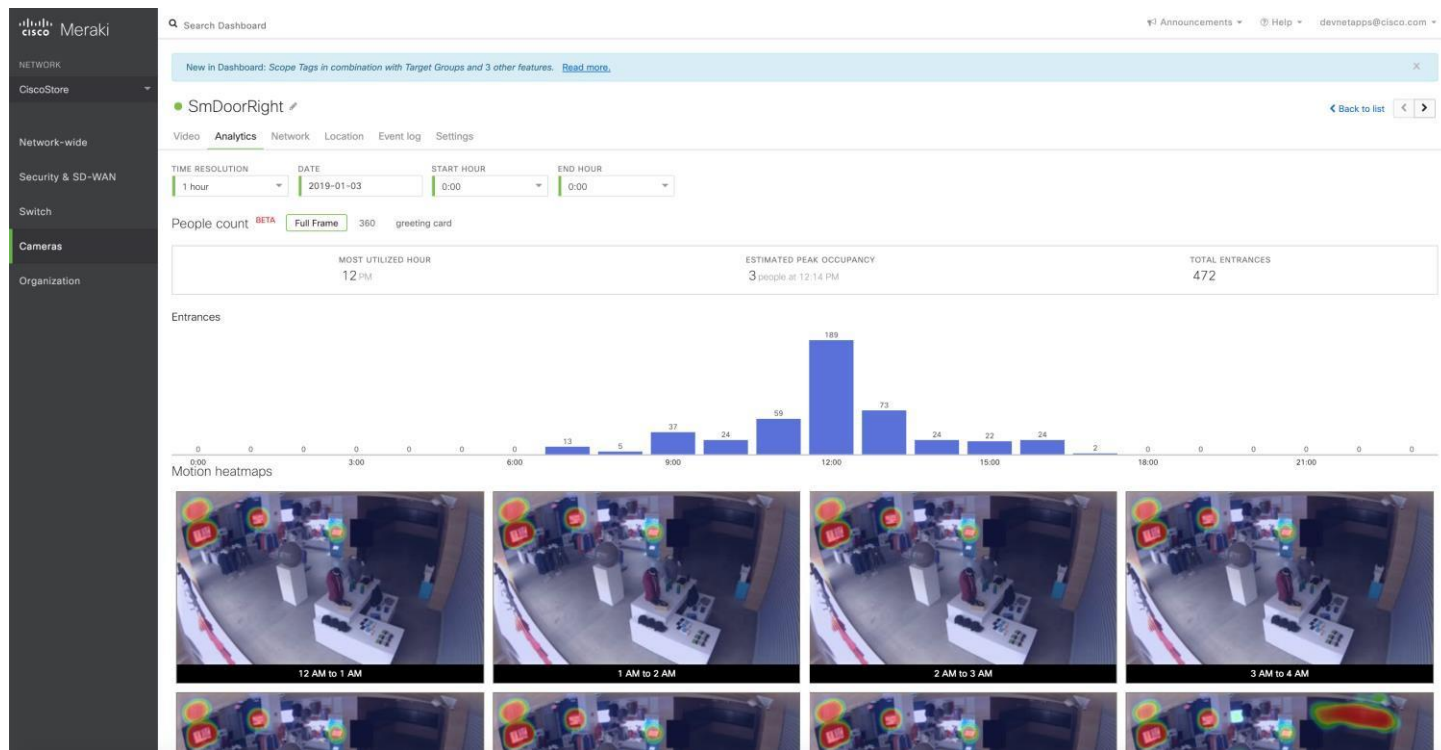
MV Sense



Dashboard: People detection in video

The screenshot displays the Cisco Meraki dashboard interface. On the left is a dark sidebar with navigation links: NETWORK, CiscoStore, Network-wide, Security & SD-WAN, Switch, Cameras, and Organization. The main content area has a top header with a search bar, user profile (devnetapps@cisco.com), and a notification banner. Below the banner, the 'SmDoorRight' camera is selected, with tabs for Video, Analytics, Network, Location, Event log, and Settings. The 'Video' tab is active, showing a live video feed of a retail store interior. Three people in the foreground are highlighted with yellow bounding boxes. A 'Q Motion search' bar and a 'Hide People' button are located above the video. To the right of the video are buttons for 'Export', 'Link video', 'Screenshot', and 'Fullscreen'. At the bottom is a timeline from 10 AM to 12:45 PM, with the current time set to 12:15:13 PM. Playback controls are visible on the left of the timeline.

Dashboard: People Count Analytics



Dashboard: Interest Zones

The screenshot displays the Cisco Meraki dashboard interface. On the left is a dark sidebar with navigation links: NETWORK, CiscoStore, Network-wide, Security & SD-WAN, Switch, Cameras (highlighted), and Organization. The top header includes the Cisco Meraki logo, a search bar, and links for Announcements, Help, and a user profile. A blue banner at the top of the main content area reads: "New in Dashboard: Scope Tags in combination with Target Groups and 3 other features. [Read more.](#)". Below this, the "POS" camera is selected, with tabs for Video, Analytics, Network, Location, Event log, and Settings (active). Under the Settings tab, sub-tabs include Video Settings, Quality and Retention, Night Mode, Motion Alerts, Wireless, Zones (active), and Senses. The "Zone config" section is marked as "BETA" and includes "Cancel" and "Save" buttons. The main area shows a "New Zone" button and three existing zones, each with a camera feed thumbnail and "DELETE" and "EDIT" options:

- Mens Jackets & Shirts**: Camera feed showing a retail counter.
- PoS**: Camera feed showing a retail counter.
- Queue**: Camera feed showing a retail counter.

MV Sense Analytics API

- Returns an overview of aggregate analytics data for a timespan
 - `/devices/[serial]/camera/analytics/overview`
- Returns all configured analytics zones for this camera
 - `/devices/[serial]/camera/analytics/zone`
- Return historical records for analytic zones
 - `/devices/[serial]/camera/analytics/zones/[zoneId]/history`
- Returns most recent record for analytics zones
 - `/devices/[serial]/camera/analytics/recent`
- Returns live state from camera of analytics zones
 - `/devices/[serial]/camera/analytics/live`

MV Sense Real Time with MQTT

- MQTT is a Client Server publish/subscribe messaging transport protocol.
- MV Camera MQTT client publishes people detection count
- Meraki Camera Notification is sample app
 - App watches people count during off-hours
 - When unexpected people are detected it send alert message using WebEx Team bot.



When detected people start monitoring mode
Condition : Total people Count > Threshold in past 10 frame

External Captive Portals

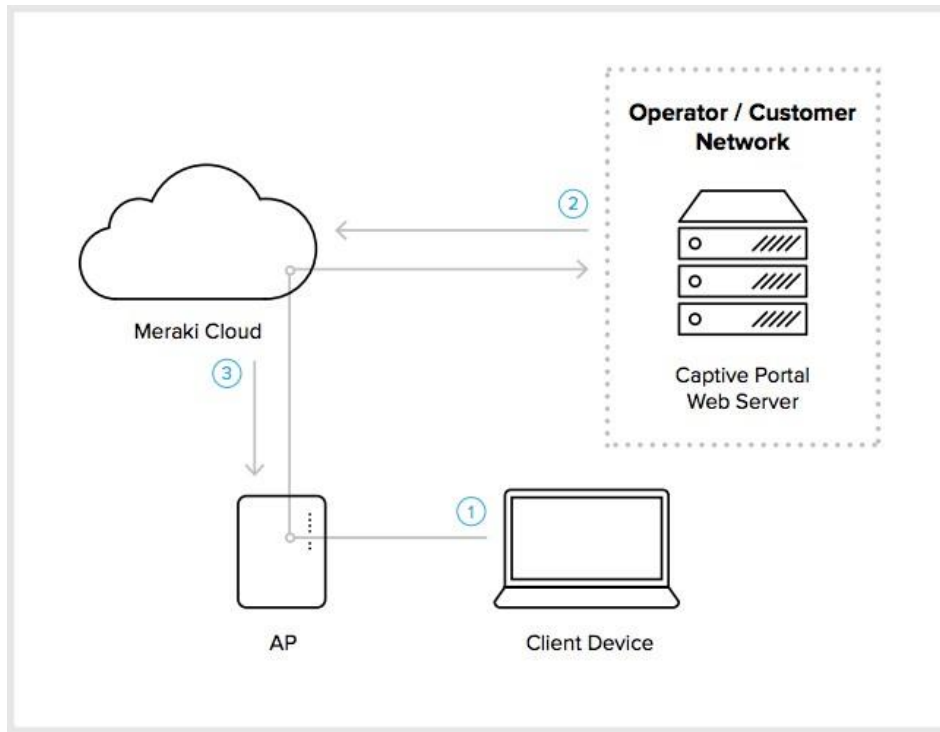


External Captive Portal (EXCAP)



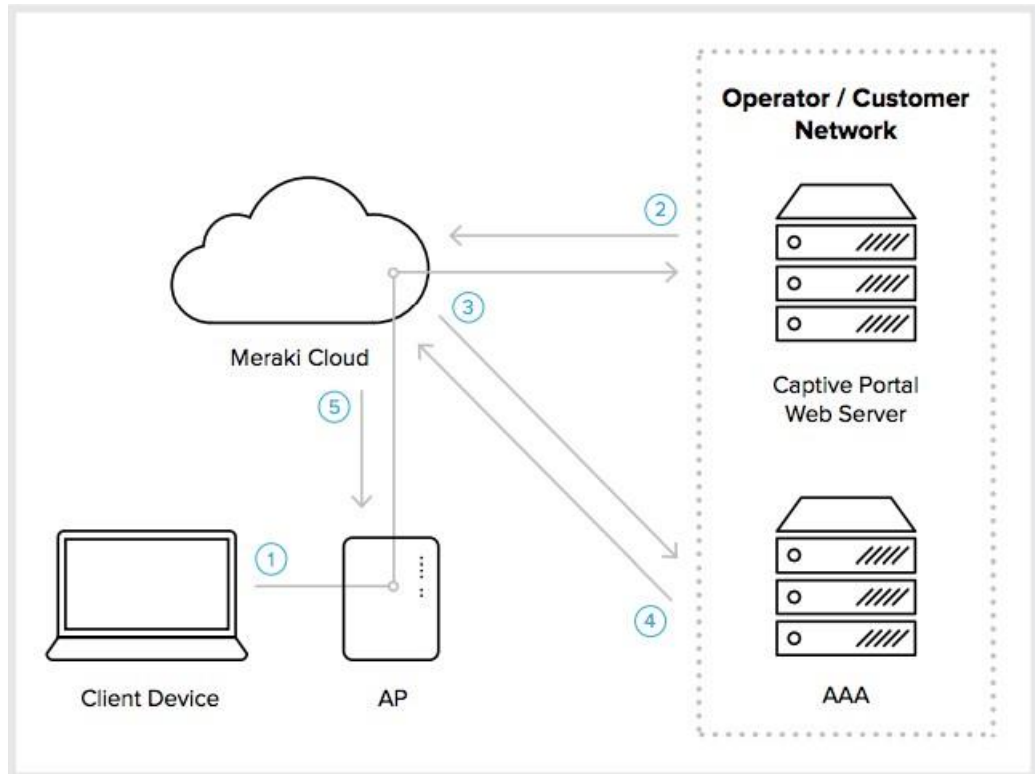
EXCAP Architecture – click through

- Simple
- Branding
- Terms of Service
- Less Secure



EXCAP with AAA – Sign on

- Advanced
- Authentication
- Accounting
- More Secure



Configuration in Meraki – Type of captive portal

Splash page

- ☐ None (direct access)
Users can access the network as soon as they associate
- ☒ Click-through
Users must view and acknowledge your splash page before being allowed on the network
- ☐ Sponsored guest login
Guests must enter a valid sponsor email and own email address before being allowed on the network
- ☐ Sign-on with Meraki authentication
Users must enter a username and password before being allowed on the network
- ☐ Sign-on with SMS Authentication
Users enter a mobile phone number and receive an authorization code via SMS.
After a trial period of 25 texts, you will need to connect with your Twilio account on the [Network-wide settings](#) page.
- ☐ Cisco Identity Services Engine (ISE) Authentication ⓘ
Users are redirected to the Cisco ISE web portal for device posturing and guest access
- ☐ Systems Manager Sentry enrollment ⓘ
Only devices with Systems Manager can access this network
- ☐ Billing (paid access) ⓘ
Users choose from various pay-for-access options, or an optional free tier

Configuration in Meraki – Walled Garden

Captive portal strength



Allow non-HTTP traffic prior to sign-on

Walled garden



Walled garden is enabled

Walled garden ranges

*.ngrok.io

[What do I enter here?](#)

Controller disconnection
behavior

The splash page for this SSID relies on the Meraki Cloud Controller. What should happen to new clients if your Internet uplink is down or the controller is otherwise unreachable?

- ☐ Open: devices can use the network without seeing a splash page, unless they are explicitly blocked
- ☐ Restricted: only currently associated clients and whitelisted devices will be able to use the network
- ☒ Default for your settings: Open

Configuration in Meraki – The Splash page

Splash page

SSID: Lyoli

Splash pages on this SSID are enabled because a click-through splash page is enabled. You can change this setting on the [access control subtab](#).

Official themes ⓘ

- ☐ Modern NEW
- ☐ Fluid

Custom themes ⓘ

[Create something new](#)

Custom splash URL

🔴 Or provide a URL where users will be redirected:

[What is this?](#)

Captive Portal APIs

PUT/networks/{networkId}/ssids/{number}

Parameters

splashPage – type of splash page
walledGardenEnabled
walledGardenRanges

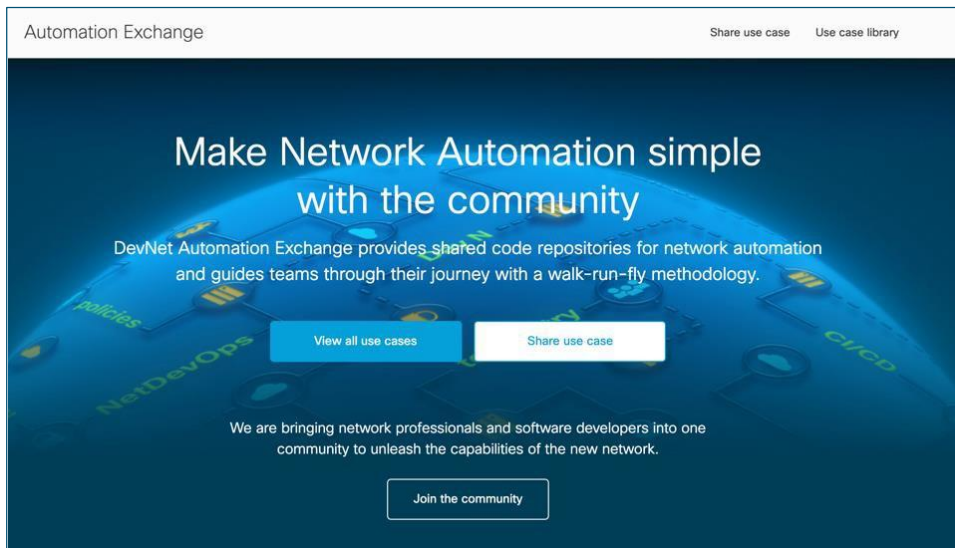
PUT/networks/{networkId}/ssids/{number}/splashSettings

Parameters

splashUrl
useSplashUrl

GET/networks/{networkId}/splashLoginAttempts

Find shared code repositories of use cases for network automation & more!



Scan this code or go to the URL to **learn more**



<http://cs.co/20eur01>

Technical Session Surveys

- Attendees who fill out a minimum of four session surveys and the overall event survey will get Cisco Live branded socks!
- Attendees will also earn 100 points in the Cisco Live Game for every survey completed.
- These points help you get on the leaderboard and increase your chances of winning daily and grand prizes.



Cisco Learning and Certifications

From technology training and team development to Cisco certifications and learning plans, let us help you empower your business and career. www.cisco.com/go/certs

Pay for Learning with Cisco Learning Credits

(CLCs) are prepaid training vouchers redeemed directly with Cisco.



Learn

Cisco U.

IT learning hub that guides teams and learners toward their goals

Cisco Digital Learning

Subscription-based product, technology, and certification training

Cisco Modeling Labs

Network simulation platform for design, testing, and troubleshooting

Cisco Learning Network

Resource community portal for certifications and learning



Train

Cisco Training Bootcamps

Intensive team & individual automation and technology training programs

Cisco Learning Partner Program

Authorized training partners supporting Cisco technology and career certifications

Cisco Instructor-led and Virtual Instructor-led training

Accelerated curriculum of product, technology, and certification courses



Certify

Cisco Certifications and Specialist Certifications

Award-winning certification program empowers students and IT Professionals to advance their technical careers

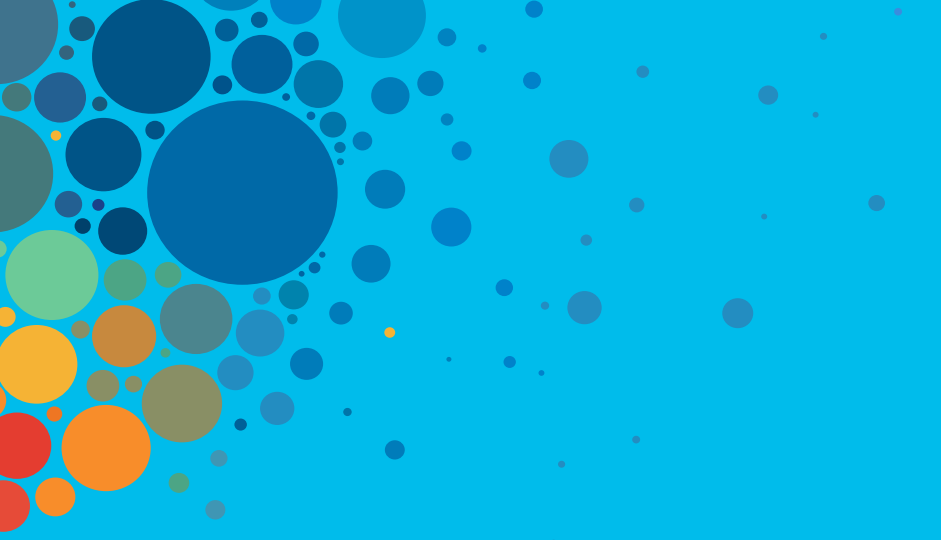
Cisco Guided Study Groups

180-day certification prep program with learning and support

Cisco Continuing Education Program

Recertification training options for Cisco certified individuals

Here at the event? Visit us at **The Learning and Certifications lounge at the World of Solutions**



Continue your education

- Visit the Cisco Showcase for related demos
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand



The bridge to possible

Thank you

CISCO *Live!*



#CiscoLive