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You make possible

Powerful Network Automation with Meraki APIs

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@theDeNap

DEVNET-1217

cisco Live!
Barcelona | January 27-31, 2020

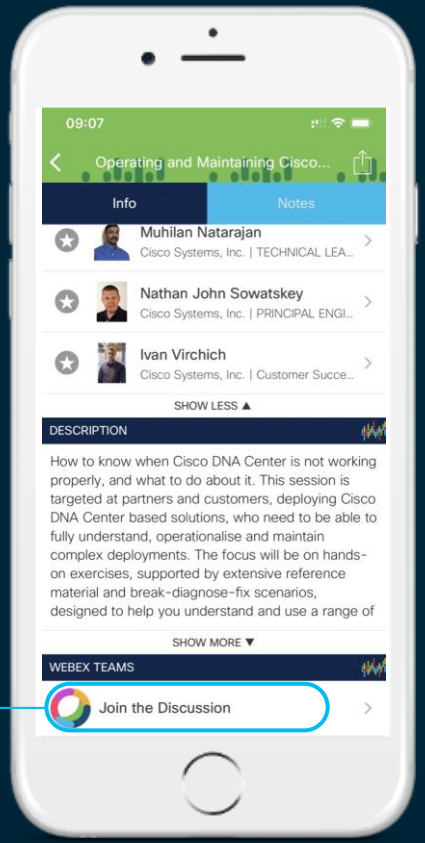
Cisco Webex Teams

Questions?

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

How

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



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Agenda

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

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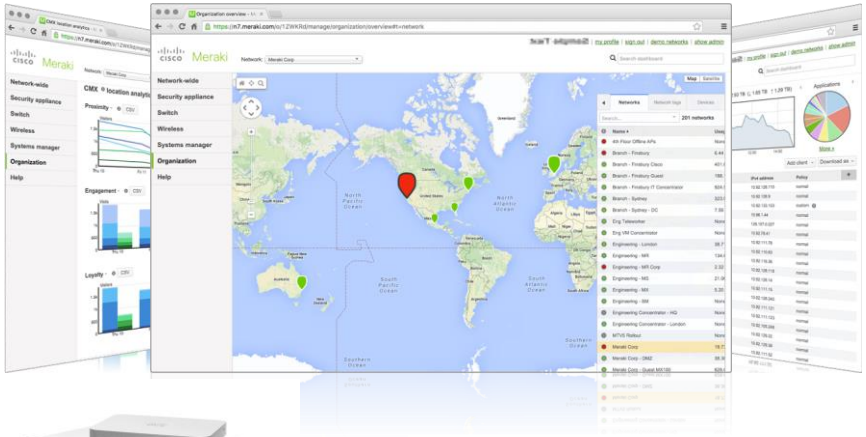
The Meraki Platform

Meraki – Cloud Management for the Enterprise



MR Wireless

MX Security Appliances

MS Switches

SM
EMM/MDM

MV Camera

CLOUD MANAGED IT

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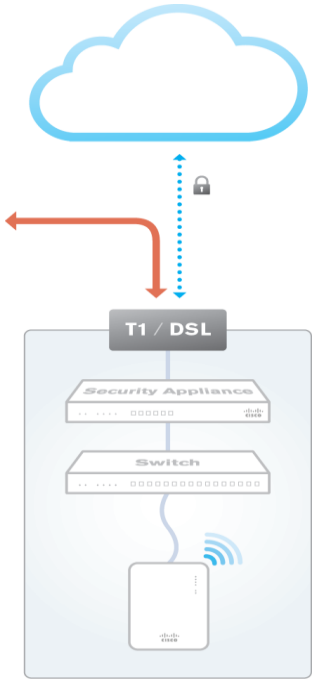
Brings the benefits of cloud to enterprise networks



- 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

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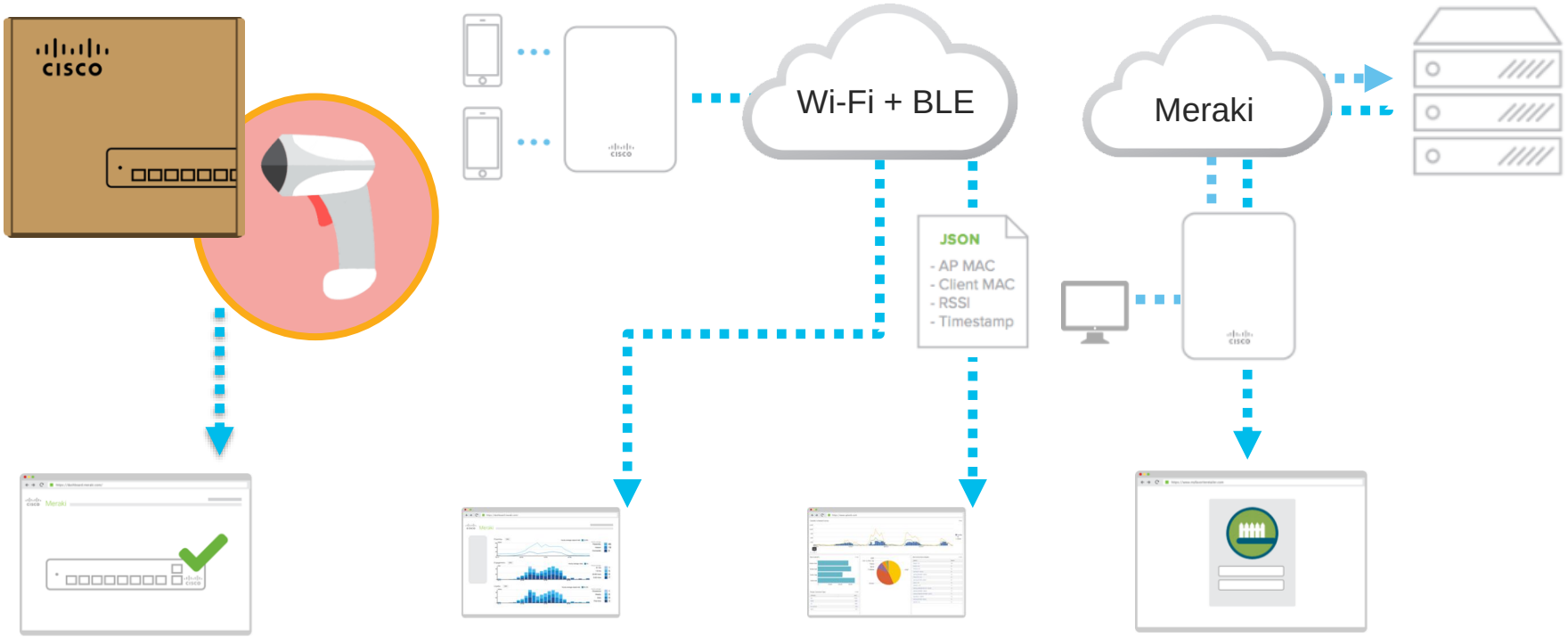
Meraki APIs

Meraki APIs

Dashboard API

Scanning API

Captive Portal API



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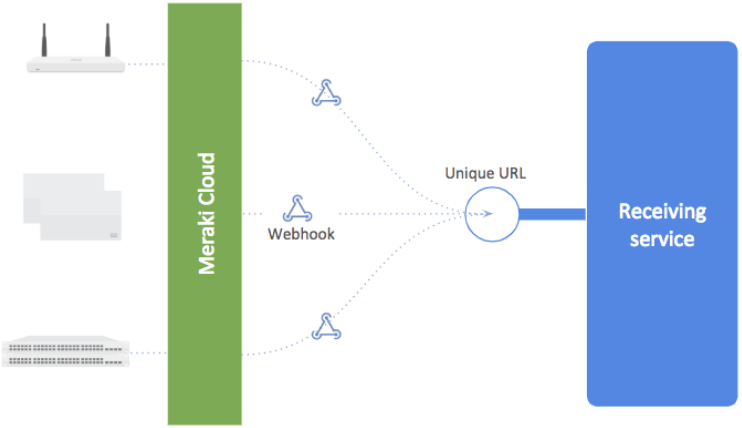
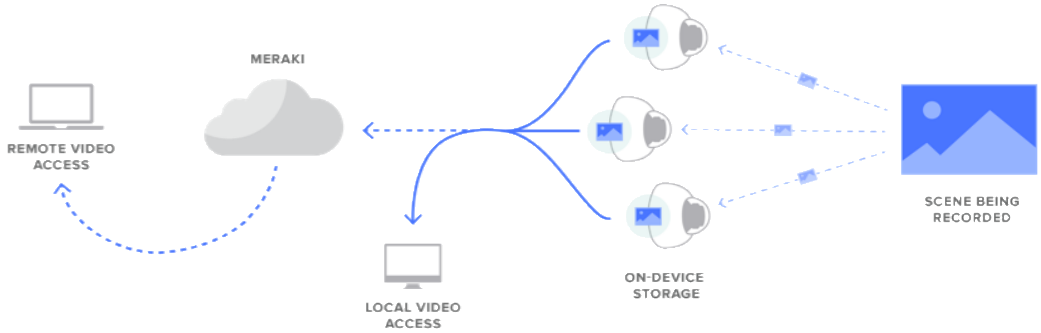
Meraki APIs – Continued

WebHook Alerts



MV Sense



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Dashboard API

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Why use the Dashboard API?

- Service Providers: OSS/BSS integration
  - Provision the customers in the Meraki cloud
  - Allocate customer's devices
  - Assign initial network configuration template
  - Configure SNMP access for monitoring
  - Add administrator accounts for NOC staff and/or end customer access
- Enterprise: Network Automation
  - Automation of large deployment projects, e.g. many branches
  - Teleworker Off-boarding to disconnect VPN home office routers
  - Configure 1,800 stores in 9 min using Templates
  - Build your own dashboard with limited access (Add/Remove APs)

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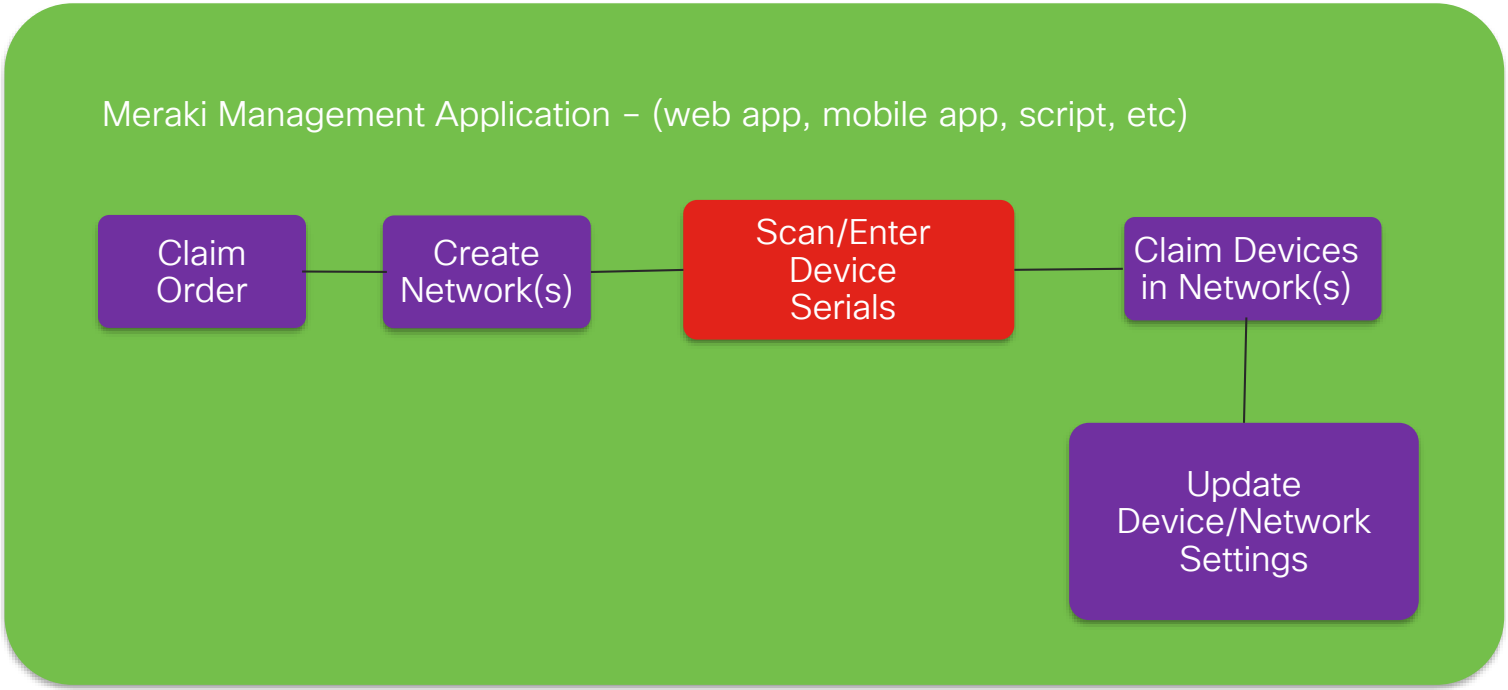
Deploy thousands of sites in minutes



Meraki API

Custom App

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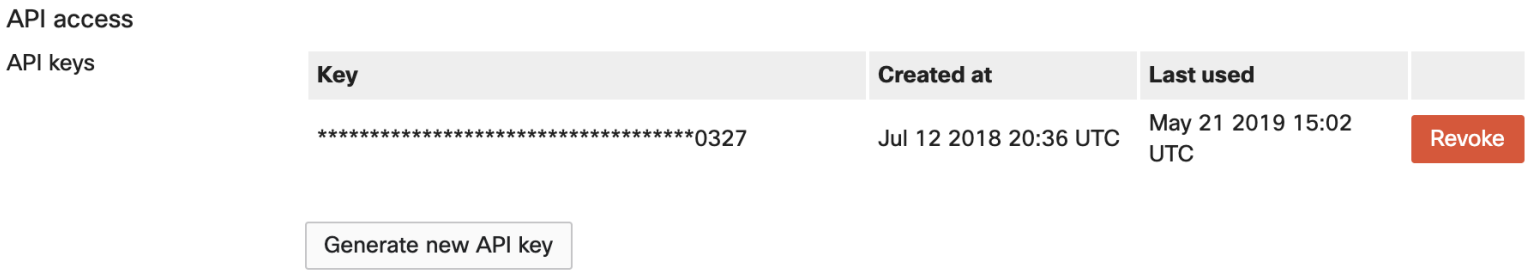
Enabling the Dashboard API



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

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Provisioning New Networks

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

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Hardening the newly provisioned network

- Segment with VLANS – **POST** /networks/**{networkId}**/vlans
- Content Filtering – **PUT** /networks/**{networkId}**/contentFiltering
- Group Policies – **POST** /networks/**{networkId}**/groupPolicies
- Network Malware Settings – **PUT** /networks/**{networkId}**/security/malwareSettings
- Firewalled Services – **PUT** /networks/**{networkId}**/firewalledServices/**{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}**

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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

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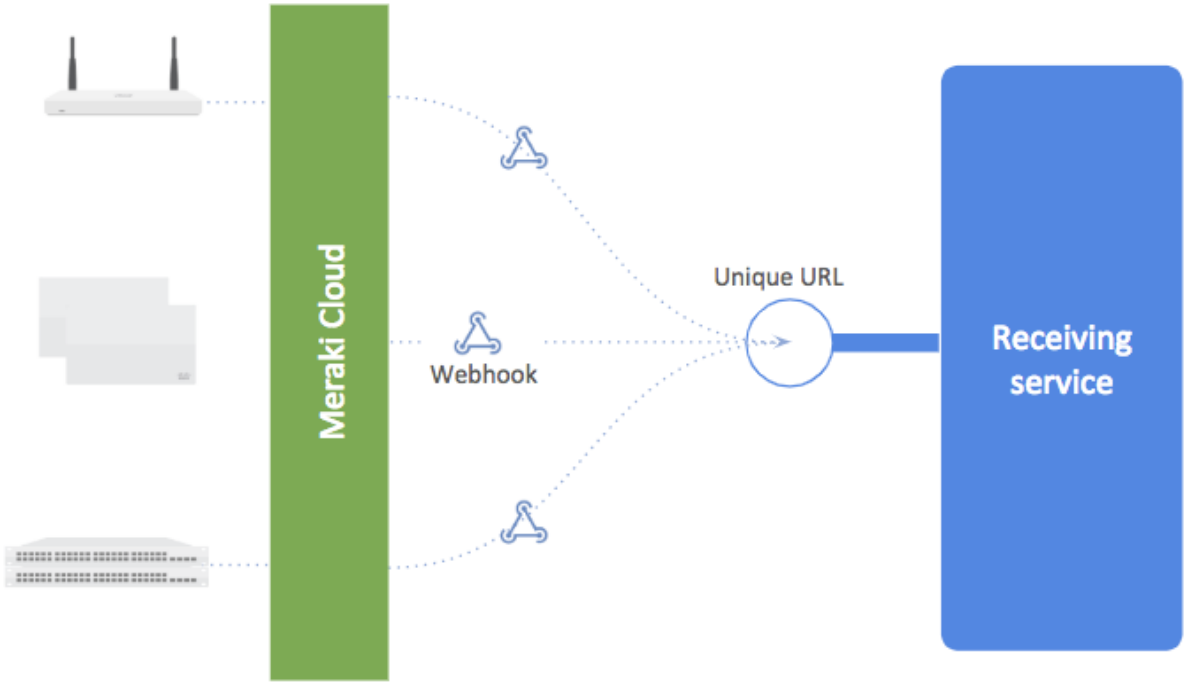
Demo – Provision and Secure 10 networks

Video – Deploy Meraki Network via WebEx Teams

WebHook Alerts

WebHook Alerts



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Example WebHook Integrations and Solutions

Generate alarms or events in your monitoring or management system

solarwinds

zendesk

pagerduty

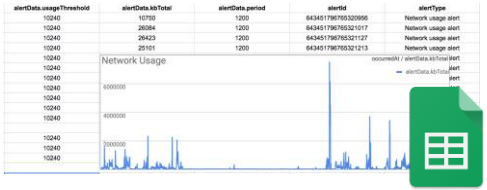
servicenow

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



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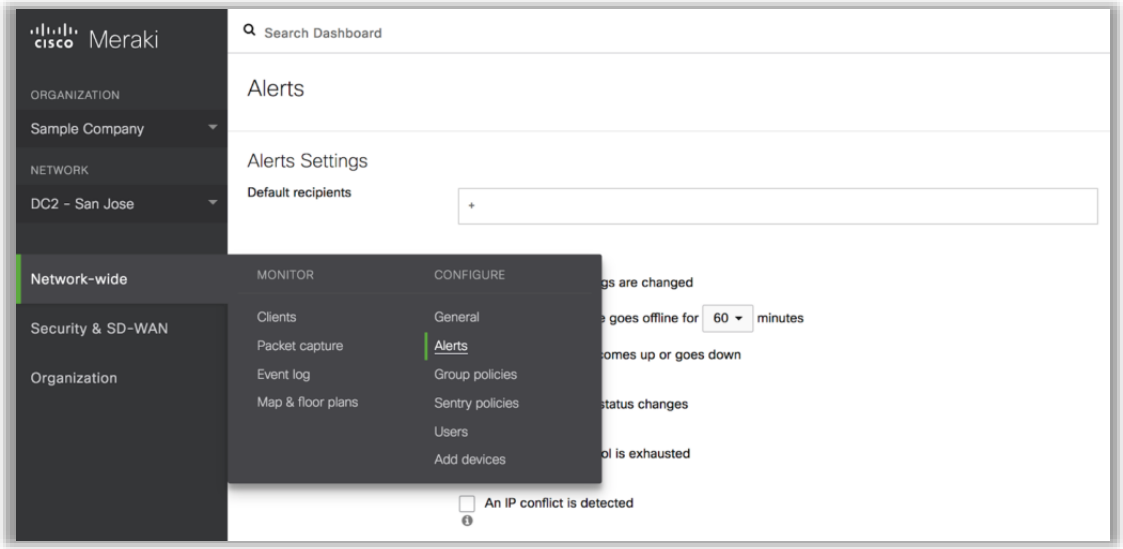
Configuring Meraki Alerts

Login to the the [Meraki Dashboard](#).
Select the Organization and Network you wish to work with and select the Alerts menu.
Network-wide → Alerts



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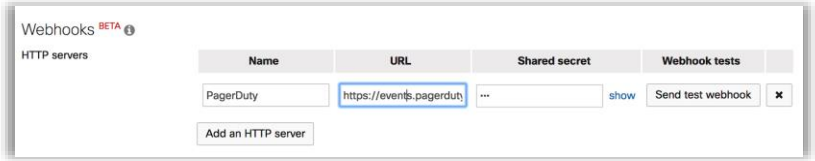
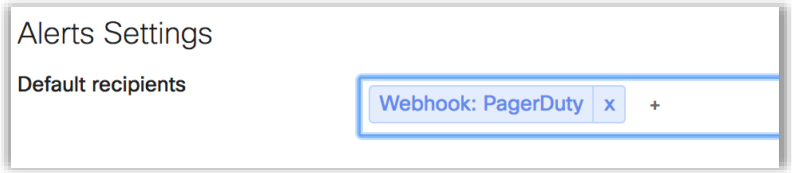
Configuring Meraki Alerts

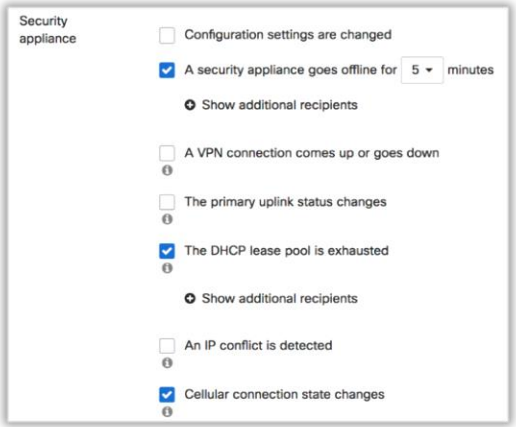
Add a New HTTP Server



Assign the server as a recipient



Select your alerts.



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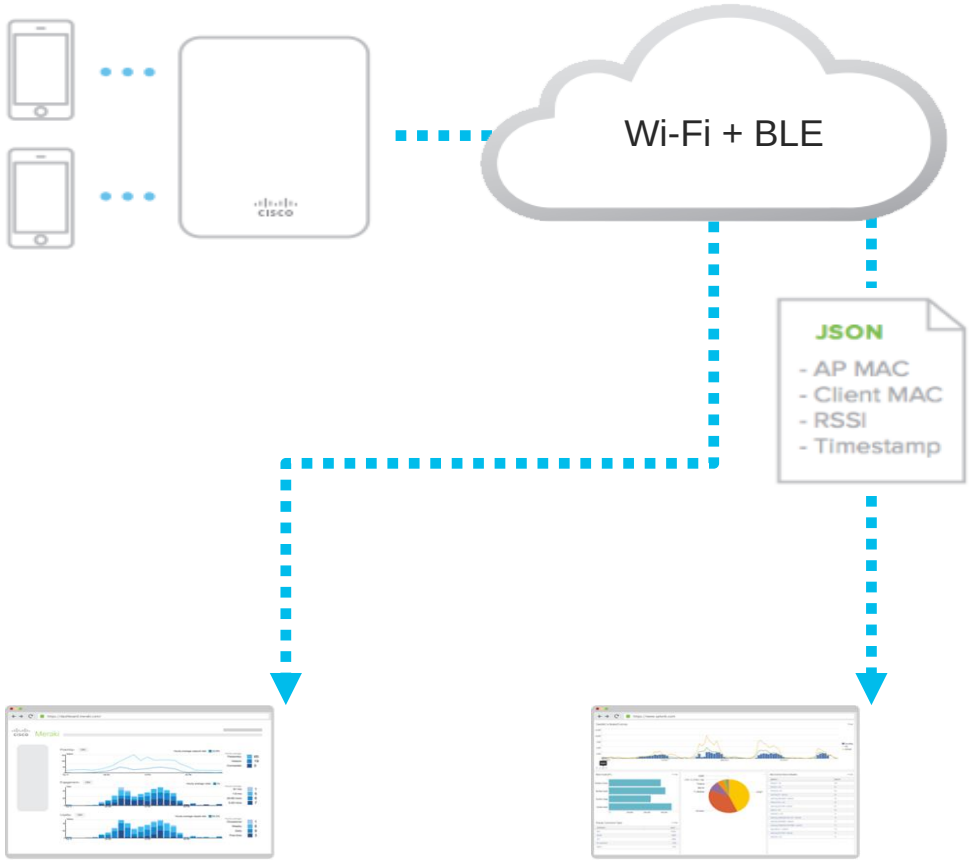
Demo – WebHook Alerts to WebEx Teams

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>, ...]
      },
    },...
  ]
}
```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Dashboard Configuration and API Flow

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.

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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 meteres) from lower-left corner of each floorplan

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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 meteres) from lower-left corner of each floorplan

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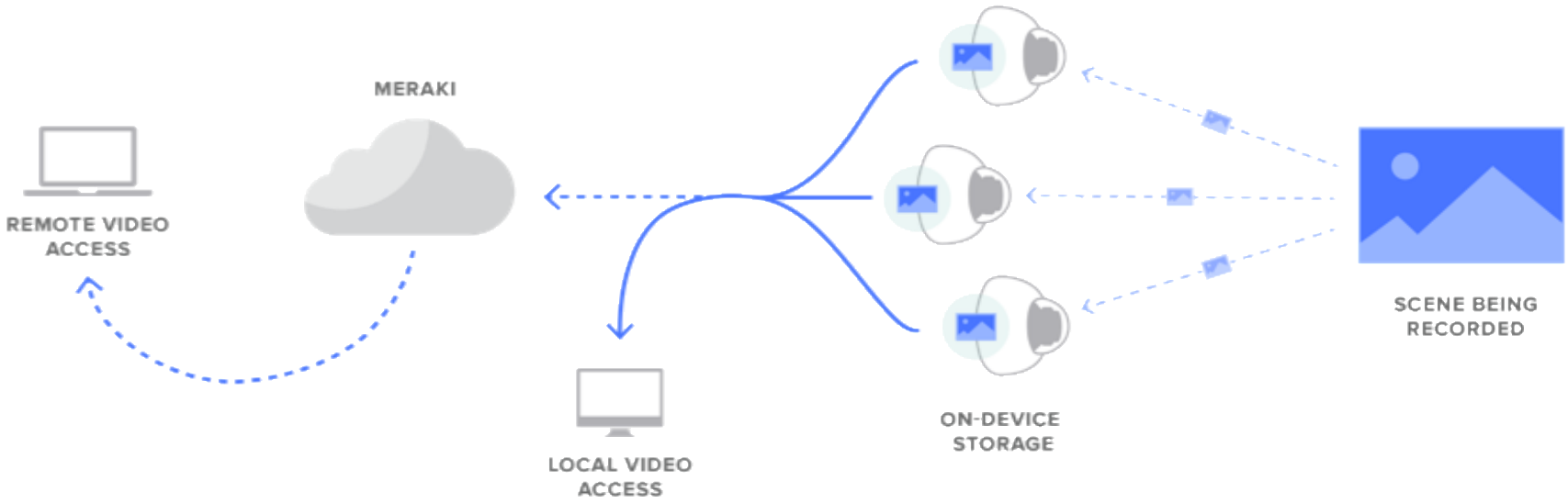
Demo – Location Scanning

MV Sense

MV Sense



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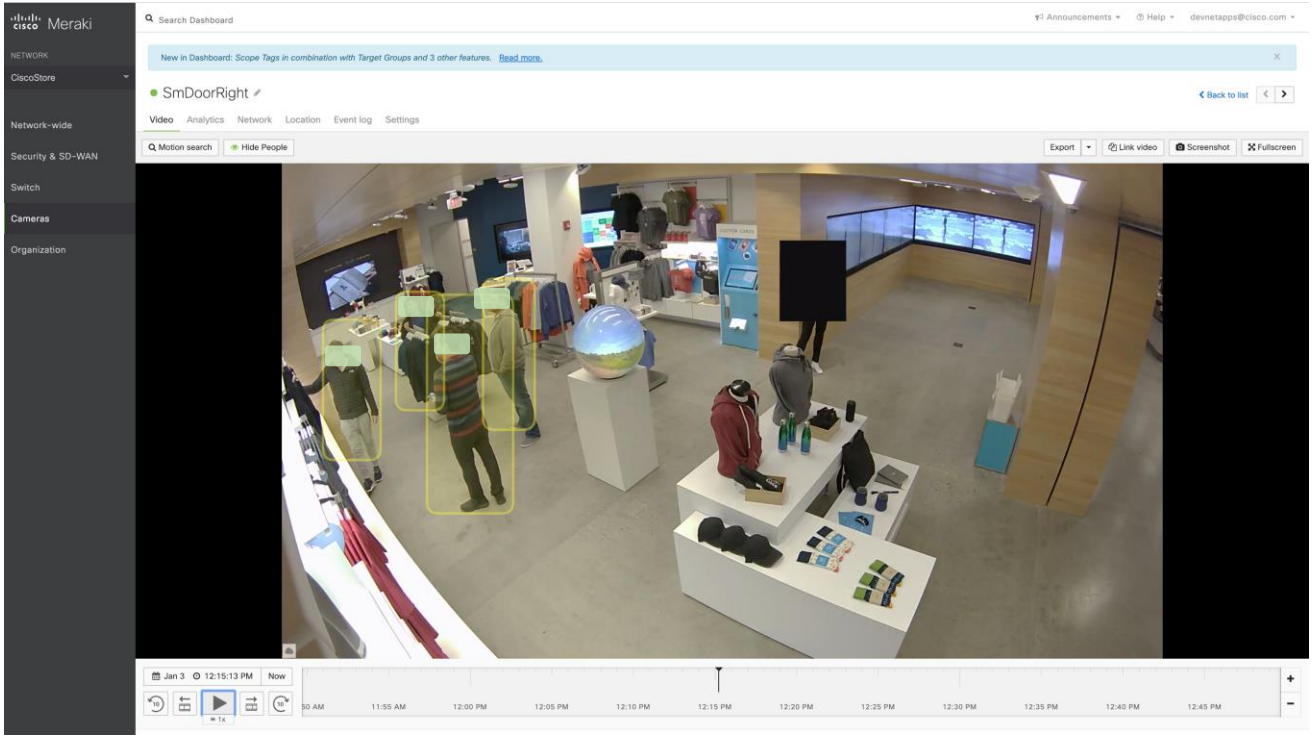
Dashboard: People detection in video



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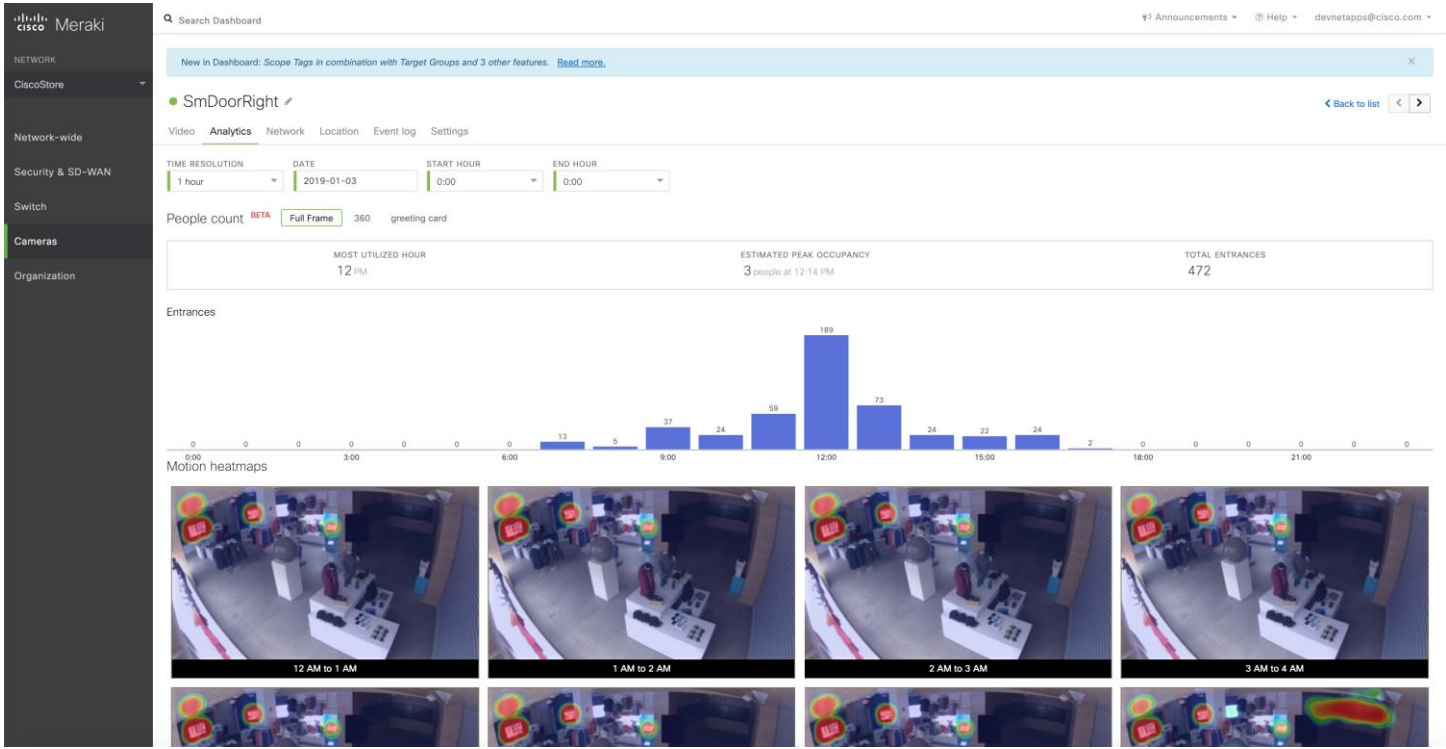
Dashboard: People Count Analytics



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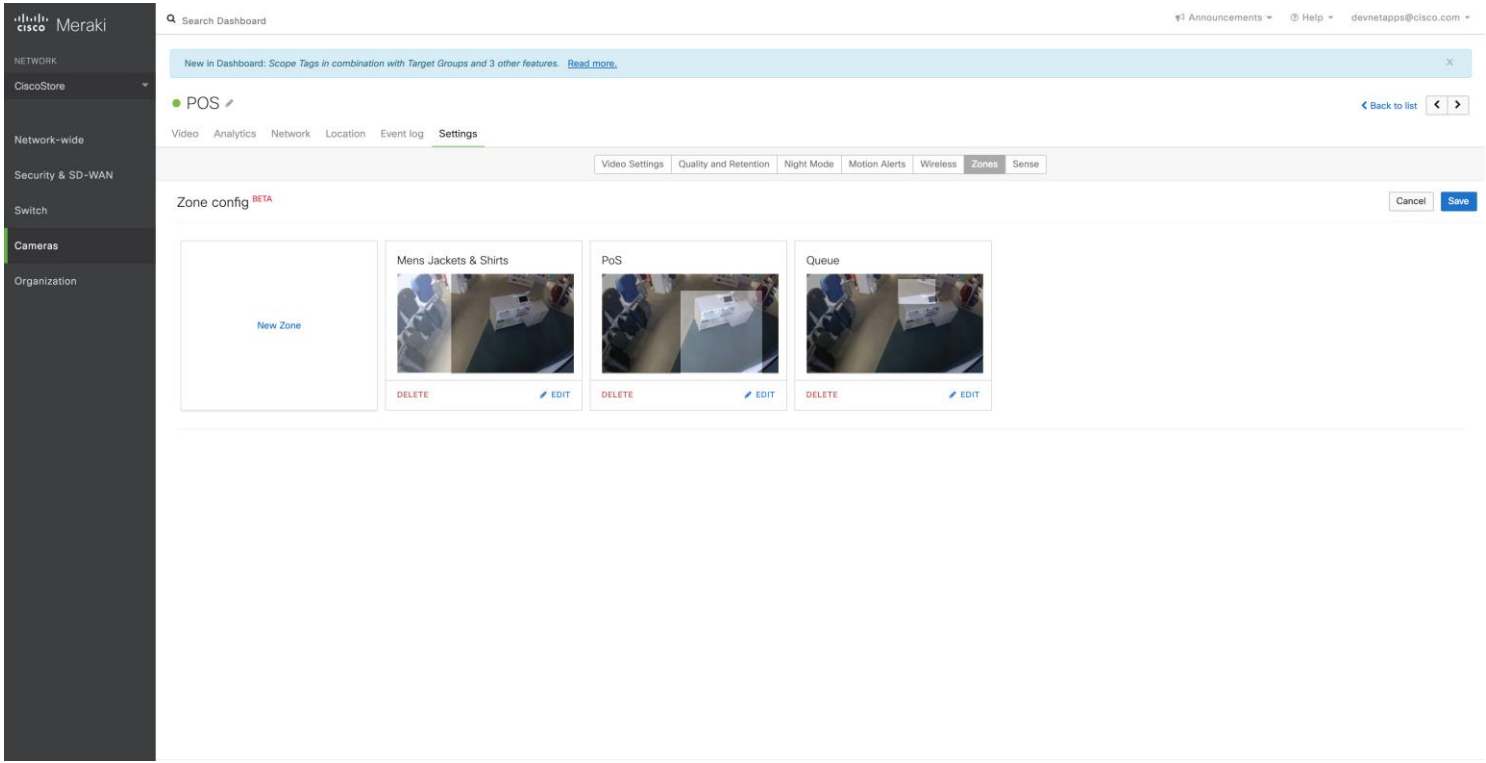
Dashboard: Interest Zones



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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

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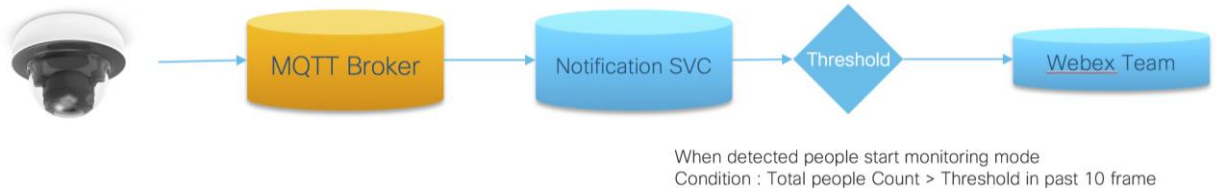
MV Sense Real Time with MQTT

- 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.



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Demo – MV Sense REST and MQTT

External Captive Portals

External Captive Portal (EXCAP)

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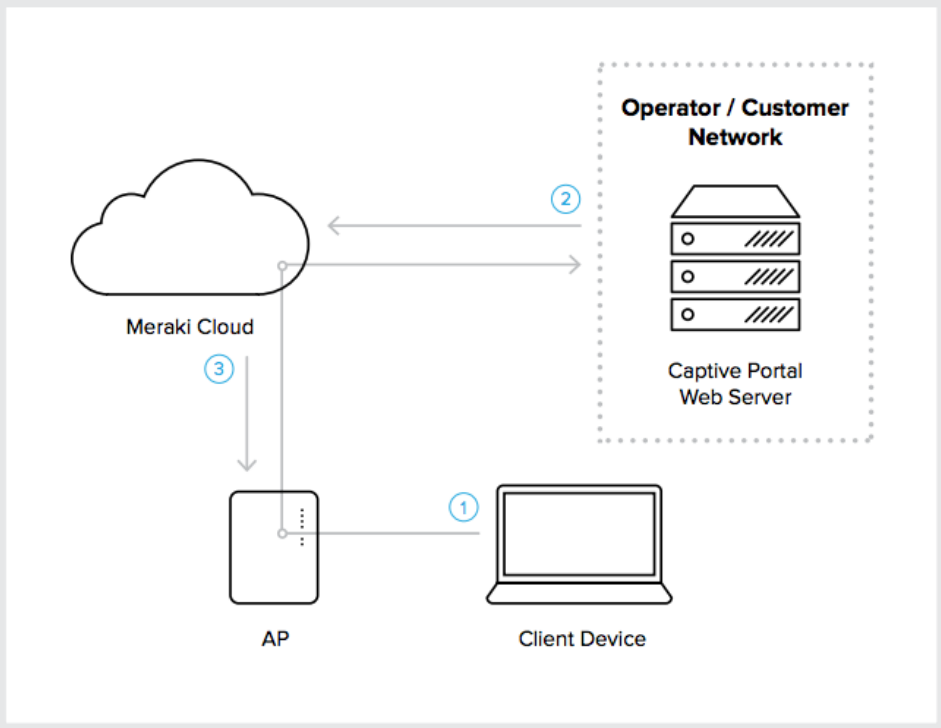
EXCAP Architecture



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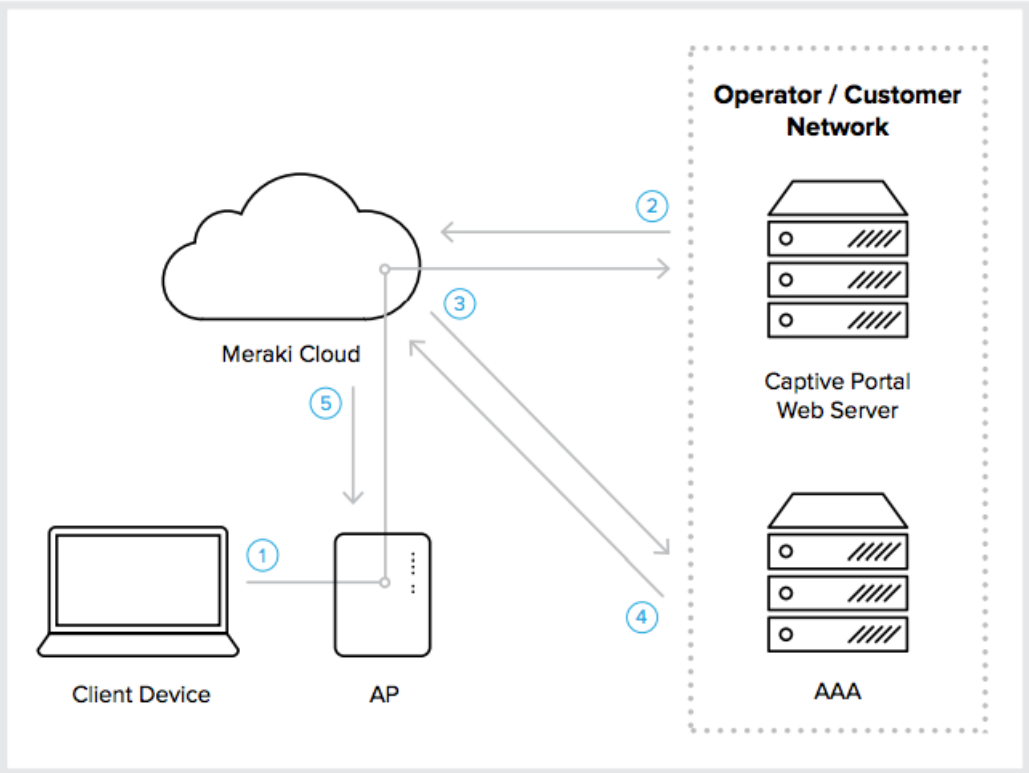
EXCAP with AAA



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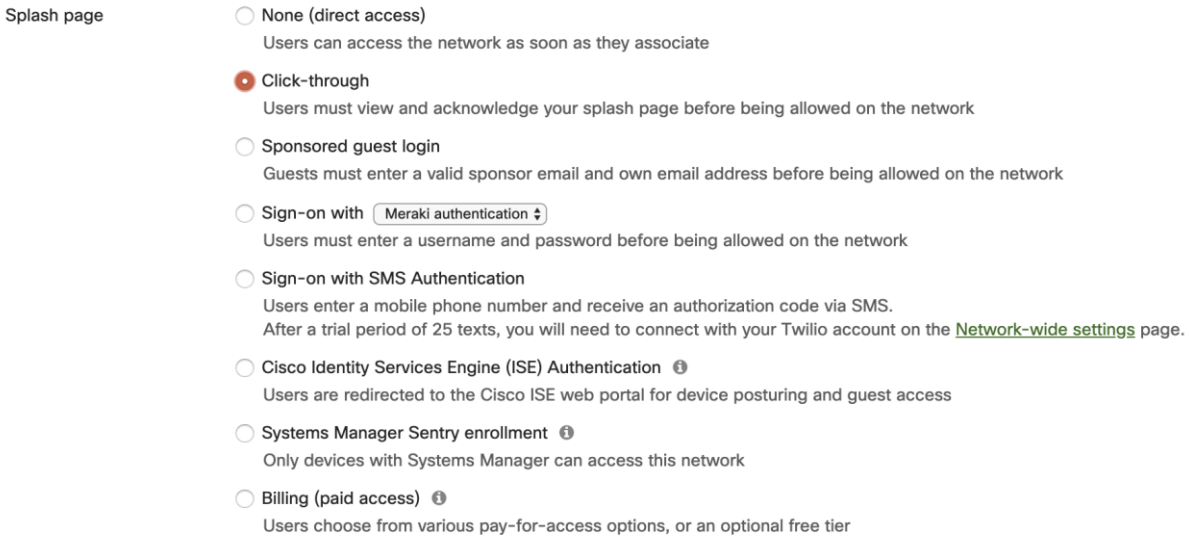
Configuration in Meraki – Type of captive portal



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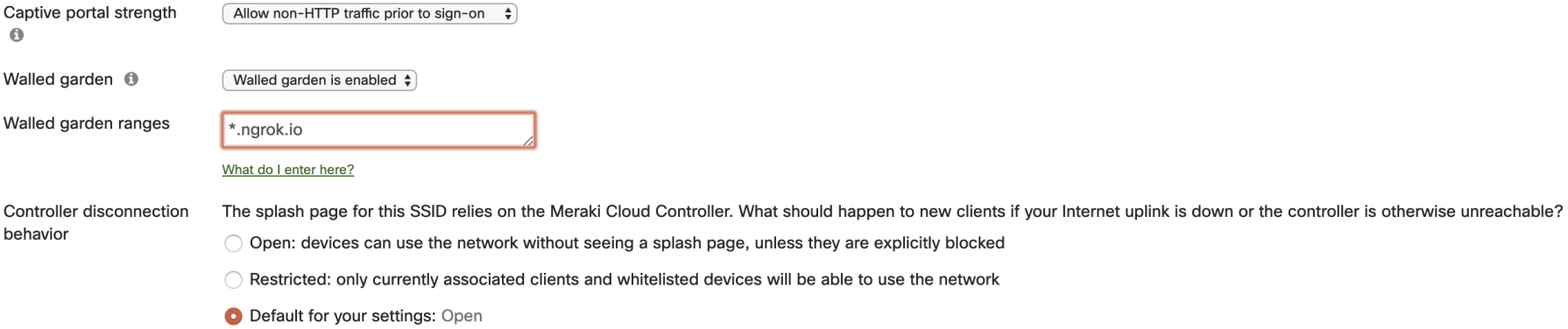
Configuration in Meraki – Walled Garden



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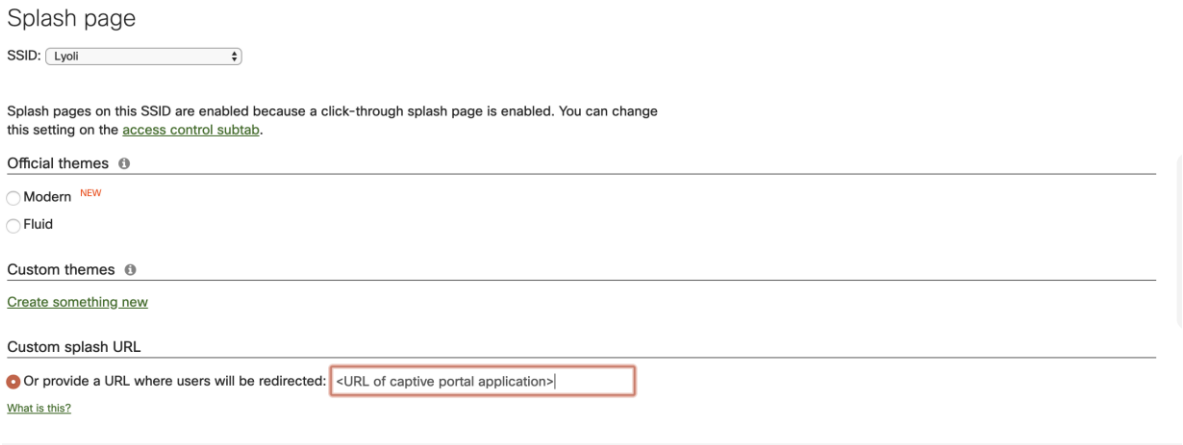
Configuration in Meraki – The Splash page



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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

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External Captive Portal Deployment

Learn more about the new DevNet Certifications and how you can prepare now!

	Associate Level	Specialist Level	Professional Level	Expert Level
Engineering				
Software				

Future Offering

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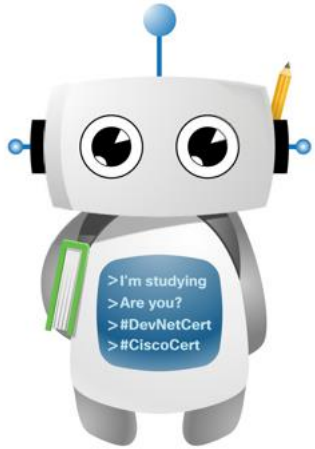

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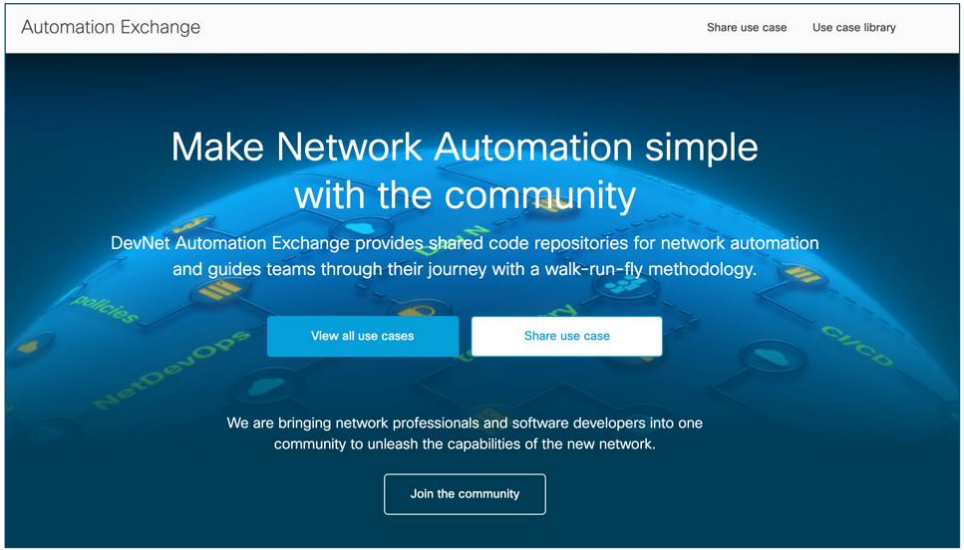

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DEVNET

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