Let's go cisco live! #CiscoLive



Integrating Meraki with Network Management Tools BRKMER-2006

Nick Burr, Technical Solutions Architect

BRKMER-2006



Cisco Webex App

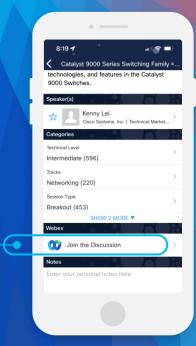
Questions?

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

How

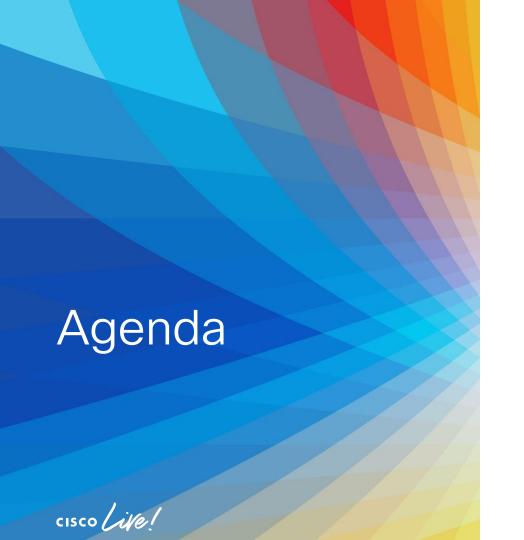
- 1 Find this session in the Cisco Live Mobile App
- Click "Join the Discussion"
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until June 9, 2023.



https://ciscolive.ciscoevents.com/ciscolivebot/#BRKMER-2006





- Introduction
- Meraki Platform Adoption
- Integration Capabilities
- Meraki Marketplace
- Q&A

Meraki Adoption



Why Do Customers Chose Meraki?



Why Do Customers Chose Meraki?

- Ease of Use
- Simplicity
- Fast Deployment
- Cloud dashboard
- Embedded Visibility & Alerting
- Automation
- Operational Efficiency



What Kind of Companies Use Meraki?



What Kind of Companies Use Meraki?

















75% of the Fortune 500



































Current Scale and Fast Facts

- Over 13.2M Meraki devices checking in to dashboard each day
- Over 8.98B API calls per month
- Over 4.3M active networks worldwide
- Over 346M+ connected devices on Meraki networks



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- Over 13.2M Meraki devices checking in to dashboard each day
- Over 8.98B API calls per month
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- Over 346M+ connected devices on Meraki networks

How many use dashboard alone for management?



Integration Points



Network Management Interfaces

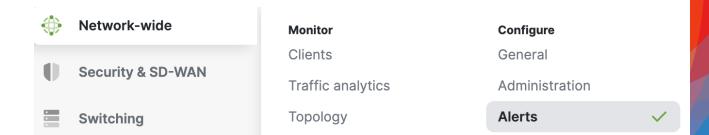
Email	Syslog	SNMP	SNMP Traps	Dashboard API	Webhooks



Sourced from the Cloud Sourced from Meraki Device



Email



Use Case & Considerations:

Simplest way for customers to get up/down and other notifications. Alerts go to network admins (not org admins or SAML admins)

Certain alerts are rate limited

Types of notifications:

Device Up/Down

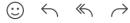
Configuration change

Product-specific alerts (ie. cellular down, rogue AP detected, switch cable error, camera motion)



Email - Sample Output

Alert for Hartford - appliance - appliances went down





○ Cisco Meraki - No Reply <alerts-noreply@meraki.com>

Today at 11:43 AM

To:

Nick Burr (nicburr)



The security appliance in the <u>Hartford - appliance</u> network has become unreachable from the Meraki cloud.

BDL MX75 f8:9e:28:e9:ec:30 09:38 AM PDT on May 20

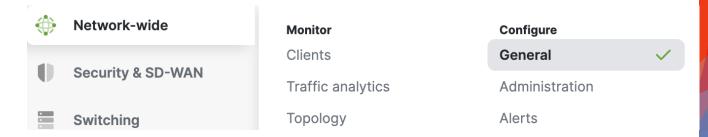
- Cisco Meraki



Demo: Email Alerts



Syslog



Use Case & Considerations:

Sourced from the device-stays local to customer network Good for device-level, event-driven alerts (ie. something changed) Sent unencrypted, VPN tunnel may be required

Types of notifications:

MX: IDS/IPS events, AutoVPN up/down, URLs, Flows, DHCP lease

MS: port status change, STP change, 802.1x auths, power supply change

MR: Associations/Disassociations, 802.1x auths, URLs, Flows

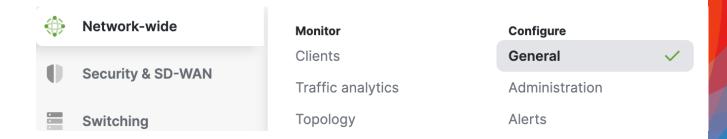
MV, MT: Do not syslog



Syslog Samples







Use Case & Considerations:

Widely used standards-driven network management protocol Some NMS tools need extra tweaking for Meraki devices No CPU or memory information available Support for SNMPv2-MIB and IF-MIB (majority of OIDs, read only)

Types of information available:

Interface statistics (64 byte)
Interface up/down status
Device make/model/name
Interface name



Demo: SNMP Walk of MX



Last login: Tue Mar 21 18:06:03 on ttys002 nicholas.burr@MacBook-Pro ~ % ■

Last login: Tue Mar 21 18:06:03 on ttys002
nicholas.burr@MacBook-Pro ~ % snmpwalk -c community 192.168.128.1

Model

Device name in dashboard

```
Last login: Tue Mar 21 18:06:03 on ttys002
nicholas.burr@MacBook-Pro ~ % snmpwalk -c community 192.168.128.1
SNMPv2-MIB::svsDescr.0 = STRING: Meraki MX85
SNMPv2-MIB::sysObjectID.0 = OID: SNMPv2-SMI::enterprises.29671.2.125
SNMPv2-MIB::svsName.0 = STRING: Burr - MX85
SNMPv2-MIB::sysORID.1 = OID: SNMPv2-MIB::snmpMIB
SNMPv2-MIB::sysORID.2 = OID: SNMP-VIEW-BASED-ACM-MIB::vacmBasicGroup
SNMPv2-MIB::sysORID.3 = OID: IF-MIB::ifMIB
SNMPv2-MIB::sysORDescr.1 = STRING: The MIB module for SNMPv2 entities
SNMPv2-MIB::sysORDescr.2 = STRING: View-based Access Control Model for SNMP.
SNMPv2-MIB::sysORDescr.3 = STRING: The MIB module to describe generic objects for network interface sub-layer
SNMPv2-MIB::sysORUpTime.1 = Timeticks: (0) 0:00:00.00
SNMPv2-MIB::sysORUpTime.2 = Timeticks: (0) 0:00:00.00
SNMPv2-MIB::sysORUpTime.3 = Timeticks: (1) 0:00:00.01
IF-MIB::ifNumber.0 = INTEGER: 14
```

```
IF-MIB::ifIndex.6 = INTEGER: 6
IF-MIB::ifIndex.7 = INTEGER: 7
IF-MIB::ifIndex.8 = INTEGER: 8
IF-MIB::ifIndex.9 = INTEGER: 9
IF-MIB::ifIndex.10 = INTEGER: 10
IF-MIB::ifIndex.11 = INTEGER: 11
IF-MIB::ifIndex.12 = INTEGER: 12
IF-MIB::ifIndex.13 = INTEGER: 13
IF-MIB::ifIndex.14 = INTEGER: 14
IF-MIB::ifDescr.1 = STRING: port1
IF-MIB::ifDescr.2 = STRING: port2
IF-MIB::ifDescr.3 = STRING: port3
IF-MIB::ifDescr.4 = STRING: port4
IF-MIB::ifDescr.5 = STRING: port5
IF-MIB::ifDescr.6 = STRING: port6
IF-MIB::ifDescr.7 = STRING: port7
IF-MIB::ifDescr.8 = STRING: port8
IF-MIB::ifDescr.9 = STRING: port9
IF-MIB::ifDescr.10 = STRING: port10
IF-MIB::ifDescr.11 = STRING: port11
IF-MIB::ifDescr.12 = STRING: port12
IF-MIB::ifDescr.13 = STRING: port13
IF-MIB::ifDescr.14 = STRING: port14
```

```
IF-MIB::ifMtu.2 = INTEGER: 0
IF-MIB::ifMtu.3 = INTEGER: 1500
IF-MIB::ifMtu.4 = INTEGER: 1500
IF-MIB::ifMtu.5 = INTEGER: 1500
IF-MIB::ifMtu.6 = INTEGER: 1500
IF-MIB::ifMtu.7 = INTEGER: 1500
IF-MIB::ifMtu.8 = INTEGER: 1500
IF-MIB::ifMtu.9 = INTEGER: 1500
IF-MIB::ifMtu.10 = INTEGER: 1500
IF-MIB::ifMtu.11 = INTEGER: 1500
IF-MIB::ifMtu.12 = INTEGER: 1500
IF-MIB::ifMtu.13 = INTEGER: 1500
IF-MIB::ifMtu.14 = INTEGER: 1500
IF-MIB::ifSpeed.1 = Gauge32: 0
IF-MIB::ifSpeed.2 = Gauge32: 0
IF-MIB::ifSpeed.3 = Gauge32: 1000000000
IF-MIB::ifSpeed.4 = Gauge32: 1000000000
IF-MIB::ifSpeed.5 = Gauge32: 10000000
IF-MIB::ifSpeed.6 = Gauge32: 10000000
IF-MIB::ifSpeed.7 = Gauge32: 1000000000
IF-MIB::ifSpeed.8 = Gauge32: 10000000
IF-MIB::ifSpeed.9 = Gauge32: 10000000
IF-MIB::ifSpeed.10 = Gauge32: 10000000
```

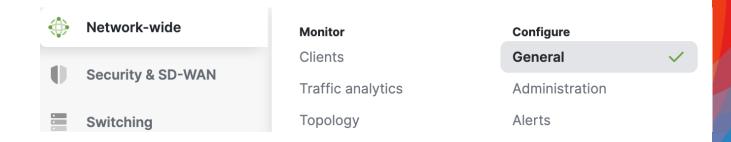
```
IF-MIB::ifPhysAddress.14 = STRING: f8:9e:28:76:9:e2
IF-MIB::ifAdminStatus.1 = INTEGER: down(2)
IF-MIB::ifAdminStatus.2 = INTEGER: down(2)
IF-MIB::ifAdminStatus.3 = INTEGER: up(1)
IF-MIB::ifAdminStatus.4 = INTEGER: up(1)
IF-MIB::ifAdminStatus.5 = INTEGER: up(1)
IF-MIB::ifAdminStatus.6 = INTEGER: up(1)
IF-MIB::ifAdminStatus.7 = INTEGER: up(1)
IF-MIB::ifAdminStatus.8 = INTEGER: up(1)
IF-MIB::ifAdminStatus.9 = INTEGER: up(1)
IF-MIB::ifAdminStatus.10 = INTEGER: up(1)
IF-MIB::ifAdminStatus.11 = INTEGER: up(1)
IF-MIB::ifAdminStatus.12 = INTEGER: up(1)
IF-MIB::ifAdminStatus.13 = INTEGER: up(1)
IF-MIB::ifAdminStatus.14 = INTEGER: up(1)
IF-MIB::ifOperStatus.1 = INTEGER: down(2)
IF-MIB::ifOperStatus.2 = INTEGER: down(2)
IF-MIB::ifOperStatus.3 = INTEGER: up(1)
IF-MIB::ifOperStatus.4 = INTEGER: up(1)
IF-MIB::ifOperStatus.5 = INTEGER: down(2)
IF-MIB::ifOperStatus.6 = INTEGER: down(2)
IF-MIB::ifOperStatus.7 = INTEGER: up(1)
IF-MIB::ifOperStatus.8 = INTEGER: down(2)
```

Demo: SNMP Walk of MS



Last login: Tue Mar 21 18:08:26 on ttys003 nicholas.burr@MacBook—Pro ~ % []





Use Case & Considerations:

Use standard SNMP to get information dashboard knows about Meraki cloud proprietary Meraki-Cloud-Controller-MIB (read only) MIB details can be downloaded from dashboard (organization—) settings)

Types of information available:

Device inventory
Device up/down status
SSID Information
Interface counters (32 byte)

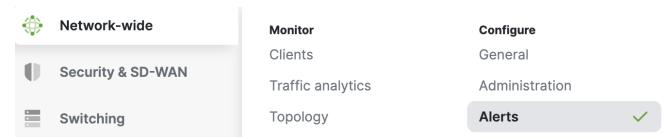


Demo: SNMP Walk of Cloud



```
Last login: Tue Mar 21 18:10:33 on ttys004
nicholas.burr@MacBook-Pro ~ % snmpwalk -v2c -t 10 -c o/pBmTcd -Ob -M +. -m +MERAKI-CLOUD-CONTROLLER-MIB snmp.
meraki.com:16100 .1
No log handling enabled - using stderr logging
./Google Drive: Operation not permitted
SNMPv2-MIB::sysDescr.0 = STRING: Cisco Meraki Cloud Controller
SNMPv2-MIB::svsObjectID.0 = OID: MERAKI-CLOUD-CONTROLLER-MIB::cloudController
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (696967000) 80 days, 16:01:10.00
SNMPv2-MIB::sysContact.0 = STRING: support@meraki.com
SNMPv2-MIB::sysName.0 = STRING: dashboard.meraki.com
SNMPv2-MIB::sysLocation.0 = STRING: 500 Terry A Francois Blvd, San Francisco, CA 94158, USA
MERAKI-CLOUD-CONTROLLER-MIB::organizationName.0 = STRING: Nicholas Burr
MERAKI-CLOUD-CONTROLLER-MIB::networkId.45.117.50.103.102.97.73.98 = STRING: "-u2qfaIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.51.102.121.57.79.100.73.98 = STRING: "3fv90dIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.53.99.50.105.101.100.73.98 = STRING: "5c2iedIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.54.71.89.72.111.100.73.98 = STRING: "6GYHodIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.55.109.53.84.51.97.73.98 = STRING: "7m5T3aIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.56.66.100.104.80.99.73.98 = STRING: "8BdhPcIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.56.112.95.95.52.97.73.98 = STRING: "8p 4aIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.57.117.99.98.82.99.73.98 = STRING: "9ucbRcIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.75.114.97.79.122.99.73.98 = STRING: "KraOzcIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.78.103.106.50.85.98.73.98 = STRING: "Ngi2UbIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.79.81.97.117.55.100.73.98 = STRING: "OQau7dIb"
MERAKI-CLOUD-CONTROLLER-MIB::networkId.86.95.121.67.110.100.73.98 = STRING: "V yCndIb"
```

SNMP Traps



Use Case & Considerations:

Customer doesn't want email, but needs alerts and prefers SNMP Customer wants communications from the cloud encrypted (SNMPv3) Customer doesn't have email feed to NMS, but can accept SNMP Traps Trap server must be able to receive traffic from the Meraki cloud

Types of notifications:

These mirror email alert settings, but can contain more information



SNMP Traps - Sample Output

SNMPv2-MIB::snmpTrapOID.0 = SNMPv2-SMI::enterprises.29671.1.1.7.20 SNMP-COMMUNITY-MIB::snmpTrapAddress.0 = 108.161.147.152 SNMPv2-SMI::enterprises.29671.1.1.1.0 = Cisco Network/Template Name SNMPv2-SMI::enterprises.29671.1.1.2.1.2 = Branch Wireless Template SNMPv2-SMI::enterprises.29671.1.1.2.1.3 = usb@nickburr.com SNMPv2-SMI::enterprises.29671.3.1 = {"ssid[association_control_method]":{"label":"Association requirements","new":"Pre-shared key", "old":"Open","changed_by":"Nicholas Burr (usb@nickburr.com)","ssid_id":2}}

SNMPv2-MIB::snmpTrapOID.0 = SNMPv2-SMI::enterprises.29671.1.1.7.20

|SNMP-COMMUNITY-MIB::snmpTrapAddress.0 = 108.161.147.152

SNMPv2-SMI::enterprises.29671.1.1.1.0 = Cisco

SNMPv2-SMI::enterprises.29671.1.1.2.1.2 = Branch Security Template

SNMPv2-SMI::enterprises.29671.1.1.2.1.3 = usb@nickburr.com

|SNMPv2-SMI::enterprises.29671.3.1 = {"update_admins_testuser@nickburr.com":{"label":"Removed testuser [testuser@nickburr.com]", old":"[\"Organization: full privileges\"]","new":"[]","changed_by":"Nicholas Burr (usb@nickburr.com)","ssid_id":2}}"



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Dashboard API

Use Case & Considerations:

Modern, REST based API
Use for provisioning, monitoring, live tools
Strategic going forward

Types of information available:

Client traffic monitoring/Traffic analytics

License & device status status

Firmware management

Network configurations (firewall rules, SSID configs, VLAN info, etc)

Get help

Community

Cases

New features

Firewall info

API docs

Hardware replacements



Dashboard API - Sample Output

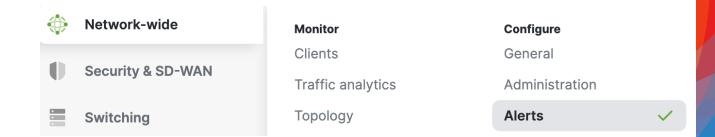
Device Uplink Status Endpoint:

```
https://api.meraki.com/api/v1/organizations/<org ID>/devices/statuses
                  name: "BDL MX75",
                  serial: "O3FA-ZLXJ-NTUO",
                  mac: "f8:9e:28:e9:ec:30",
                  publicIp: "76.113.171.218",
                  networkId: "L 3708714293139604051",
                  status: "online",
                  lastReportedAt: "2023-05-20T20:33:43.583000Z",
                  productType: "appliance",
                ▶ components: { ... },
                  model: "MX75",
                  tags: [ ],
                  usingCellularFailover: false,
                  wanlIp: "10.10.50.8",
                  wan1Gateway: "10.10.50.1",
                  wan1IpType: "dhcp",
                  wan1PrimaryDns: "10.10.50.1",
                  wan1SecondaryDns: null,
                  wan2Ip: null,
                  configurationUpdatedAt: "2023-05-20T16:28:22Z"
```

Demo: Dashboard API



Webhooks



Use Case & Considerations:

Customer doesn't want email, but needs alerts and prefers webhooks Customer wants communications from the cloud encrypted (HTTPS) Customer doesn't have email feed to NMS, but can accept HTTPS Posts Web server/webhooks receiver must be able to receive from Meraki cloud Strategic moving forward

Types of notifications:

These mirror email alert settings, but can contain more information



Webhooks-Sample Output

```
"version": "0.1".
"sharedSecret": "",
"sentAt": "2023-05-29T20:36:30.758890Z",
"organizationId": "3708714293139603550",
"organizationName": "Cisco Live US 2023 NB",
"organizationUrl": "https://n588.meraki.com/o/6Ij1Abuxb/manage/organization/overview",
"networkId": "L_3708714293139604051",
"networkName": "Hartford",
"networkUrl": "https://n588.meraki.com/Hartford-wireles/n/SwWv3cuxb/manage/nodes/list",
"alertId": "3708714293139896154".
"alertType": "Settings changed",
"alertTypeId": "settings changed",
"alertLevel": "informational",
"occurredAt": "2023-05-29T20:26:28.936280Z",
"alertData": {
  "name": "Overview".
 "url": "/manage/configure",
  "changes": {
   "ssid0Enabled": {
      "label": "Hartford - wireless WiFi enabled",
      "oldText": "enabled",
      "newText": "disabled",
      "changedBy": "Nick Burr (ciscolive@nickburr.com)",
      "ssidId": null
```



Webhooks-Sample Output

Meraki Default Format

Payload "version":"0.1". "sharedSecret":"Meraki123", "sentAt": "2020-12-14T20:23:34.250243Z". "organizationId": "330052". "organizationName": "Nicholas Burr", "organizationUrl": "https://n98.meraki.com/o/pBmTcd/", "networkId":"L 618119048856613411". "networkName":"3701 Mt Vernon Ln". "networkUrl": "https://n98.meraki.com/sds/n/wb/manage/", "deviceSerial": "Q2PV-5H5K-7BAP", "deviceMac": "98:18:88:00:ed:79". "deviceName": "MV32". "deviceUrl": "https://n98.meraki.com/sds/manage/nodes/". "deviceTags":["recently-added"], "deviceModel":"MV32". "alertId":"". "alertType": "Power supply went down", "alertTypeId": "power_supply_down",

"occurredAt": "2020-12-14T20:23:33.870809Z".

"alertLevel": "critical".

"alertData":{

What Receiver Requires

```
Header
                AUTHORIZATION:
Payload
      "version":"0.1",
     "sentAt": "2020-12-14T20:23:34.250243Z",
     "organizationId": "330052",
     "organizationName": "Nicholas Burr",
     "organizationUrl": "https://n98.meraki.com/o/pBmTcd/",
     "networkId":"L 618119048856613411",
     "networkName": "3701 Mt Vernon Ln",
     "networkUrl": "https://n98.meraki.com/sds/n/wb/manage/",
     "deviceSerial":"Q2PV-5H5K-7BAP",
     "deviceMac": "98:18:88:00:ed:79",
     "deviceName": "MV32".
     "deviceUrl": "https://n98.meraki.com/sds/manage/nodes/",
     "deviceTags":["recently-added"],
     "deviceModel":"MV32".
     "alertId":"",
     "alertType": "Power supply went down",
     "alertTypeId": "power supply down",
     "alertLevel": "critical",
     "occurredAt": "2020-12-14T20:23:33.870809Z",
     "alertData":{
```



Header

Meraki Default Format

Header

```
Payload
     "version":"0.1".
     "sharedSecret":"Meraki123",
     "sentAt": "2020-12-14T20:23:34.250243Z".
     "organizationId": "330052",
     "organizationName": "Nicholas Burr",
     "organizationUrl": "https://n98.meraki.com/o/pBmTcd/",
     "networkId":"L 618119048856613411".
     "networkName":"3701 Mt Vernon Ln",
     "networkUrl": "https://n98.meraki.com/sds/n/wb/manage/".
     "deviceSerial": "Q2PV-5H5K-7BAP",
     "deviceMac": "98:18:88:00:ed:79",
     "deviceName": "MV32".
     "deviceUrl": "https://n98.meraki.com/sds/manage/nodes/",
     "deviceTags":["recently-added"],
     "deviceModel":"MV32".
     "alertId":"".
     "alertType": "Power supply went down",
     "alertTypeId": "power_supply_down",
     "alertLevel": "critical".
     "occurredAt": "2020-12-14T20:23:33.870809Z".
     "alertData":{
```

What Receiver Requires

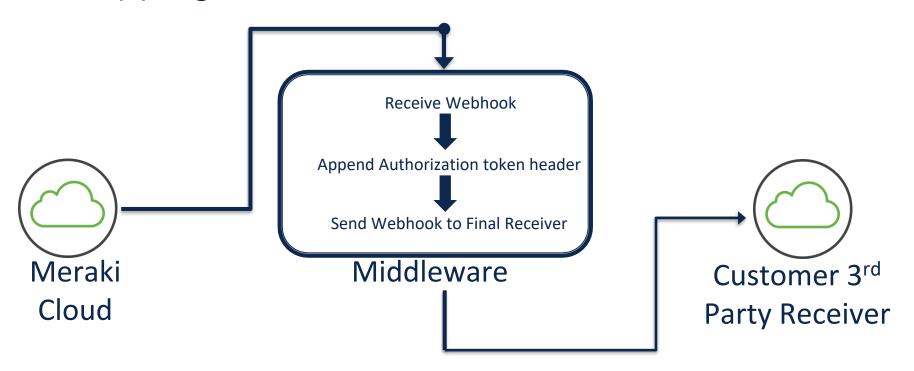
Header AUTHORIZATION:

```
Payload
```

```
"version":"0.1",
"sentAt": "2020-12-14T20:23:34.250243Z",
"organizationId": "330052",
"organizationName": "Nicholas Burr",
"organizationUrl": "https://n98.meraki.com/o/pBmTcd/",
"networkId":"L_618119048856613411",
"networkName": "3701 Mt Vernon Ln",
"networkUrl": "https://n98.meraki.com/sds/n/wb/manage/",
"deviceSerial":"Q2PV-5H5K-7BAP",
"deviceMac": "98:18:88:00:ed:79",
"deviceName":"MV32".
"deviceUrl": "https://n98.meraki.com/sds/manage/nodes/",
"deviceTags":["recently-added"],
"deviceModel":"MV32",
"alertId":"",
"alertType": "Power supply went down",
"alertTypeId":"power_supply_down",
"alertLevel": "critical",
"occurredAt": "2020-12-14T20:23:33.870809Z",
"alertData":{
```



Wrapping a Webhook





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Meraki Webhooks: Now fully customizable!

- Built in templates for Webex, ServiceNow, Slack, and Others
- Use the webhook template editor to customize format
- Liquid template language & built in filters
- Match any receiver's required format



Demo: Webhooks



Wrapping Up



Meraki Marketplace



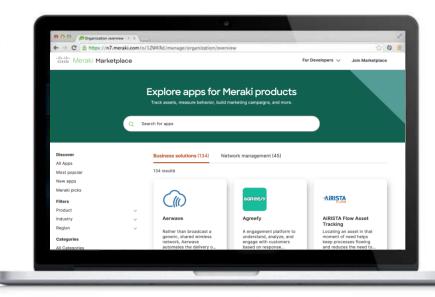
Find Supported Ecosystem Partners

√185+ Applications

√48 Solution Categories

√500+ Use Cases

https://apps.meraki.io









Final Thoughts

- Network management isn't one size fits all
- Do the homework to understand capabilities
- Decide what's best for your environment
- Modernize where possible
- Have some fun along the way!



Resources

- Documentation: <u>Alerts</u>, <u>SNMP</u>, <u>Syslog</u>, <u>API</u>, <u>Webhooks</u>, <u>Netflow</u>
- Meraki Developer Hub- http://meraki.io
- Meraki Marketplace http://apps.meraki.io
- Webhook Templates Learning Lab-<u>https://developer.cisco.com/learning/labs/meraki-webhook-template-editor-intro/introduction/</u>
- Webex Integrations - https://developer.cisco.com/meraki/webhooks/#!webex- included/webex



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Questions



Fill out your session surveys!



Attendees who fill out a minimum of four session surveys and the overall event survey will get **Cisco Live-branded socks** (while supplies last)!



Attendees will also earn 100 points in the **Cisco Live Challenge** for every survey completed.



These points help you get on the leaderboard and increase your chances of winning daily and grand prizes



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



Thank you



Cisco Live Challenge

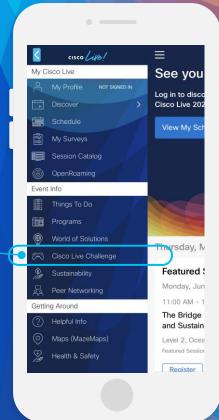
Gamify your Cisco Live experience! Get points for attending this session!

How:

- 1 Open the Cisco Events App.
- 2 Click on 'Cisco Live Challenge' in the side menu.
- 3 Click on View Your Badges at the top.
- 4 Click the + at the bottom of the screen and scan the QR code:







Let's go cisco live! #CiscoLive