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Delivering an Intent-Based Network with Cisco Meraki

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BRKCRS-2014-V

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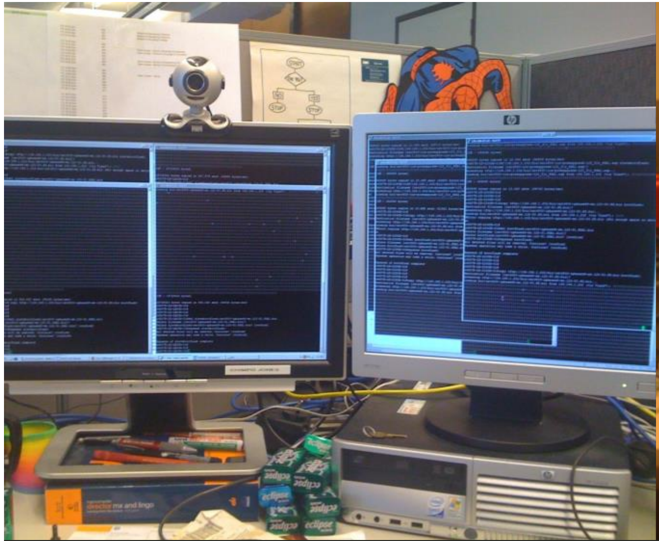
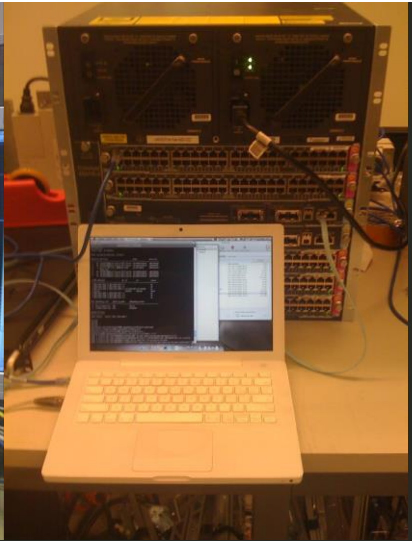
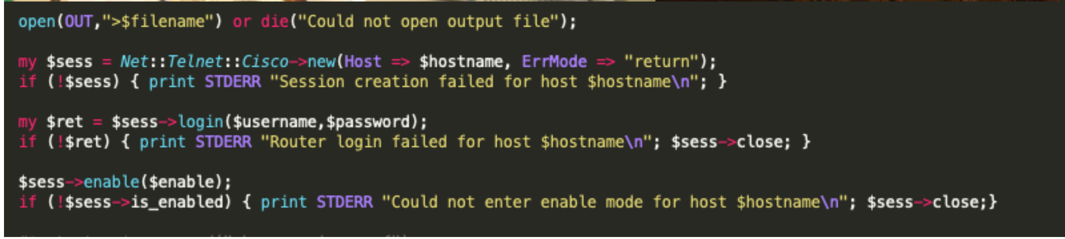
Agenda

- The Intent-Based Networking Framework
- Simplicity
- Security
- Assurance
- Cisco DNA Center Integration

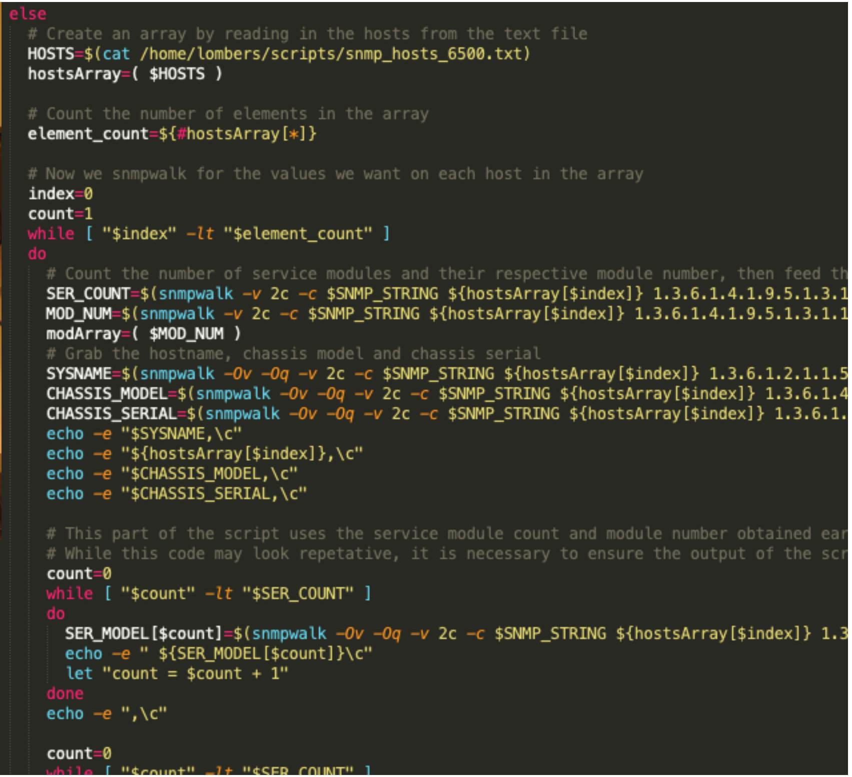
Intent-Based Networking – 2008 to 2012







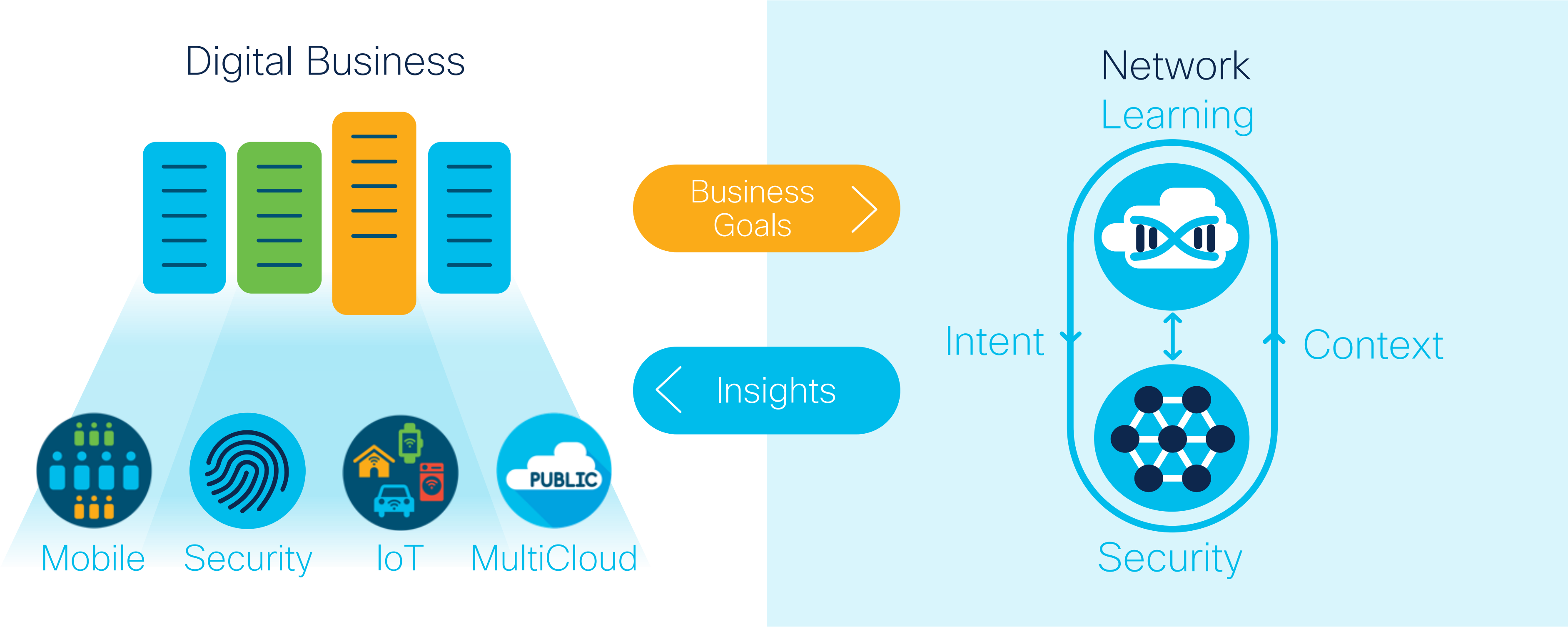
```
open(OUT,">$filename") or die("Could not open output file");

my $sess = Net::Telnet::Cisco->new(Host => $hostname, ErrMode => "return");
if (!$sess) { print STDERR "Session creation failed for host $hostname\n"; }

my $ret = $sess->login($username,$password);
if (!$ret) { print STDERR "Router login failed for host $hostname\n"; $sess->close; }

$sess->enable($enable);
if (!$sess->is_enabled) { print STDERR "Could not enter enable mode for host $hostname\n"; $sess->close;}
```



```
else
  # Create an array by reading in the hosts from the text file
  HOSTS=$(cat /home/lombers/scripts/snmp_hosts_6500.txt)
  hostsArray=( $HOSTS )

  # Count the number of elements in the array
  element_count=${#hostsArray[*]}

  # Now we snmpwalk for the values we want on each host in the array
  index=0
  count=1
  while [ "$index" -lt "$element_count" ]
  do
    # Count the number of service modules and their respective module number, then feed th
    SER_COUNT=$(snmpwalk -v 2c -c $SNMP_STRING ${hostsArray[$index]} 1.3.6.1.4.1.9.5.1.3.1
    MOD_NUM=$(snmpwalk -v 2c -c $SNMP_STRING ${hostsArray[$index]} 1.3.6.1.4.1.9.5.1.3.1.1
    modArray=( $MOD_NUM )
    # Grab the hostname, chassis model and chassis serial
    SYSNAME=$(snmpwalk -Ov -Oq -v 2c -c $SNMP_STRING ${hostsArray[$index]} 1.3.6.1.2.1.1.5
    CHASSIS_MODEL=$(snmpwalk -Ov -Oq -v 2c -c $SNMP_STRING ${hostsArray[$index]} 1.3.6.1.4
    CHASSIS_SERIAL=$(snmpwalk -Ov -Oq -v 2c -c $SNMP_STRING ${hostsArray[$index]} 1.3.6.1.
    echo -e "$SYSNAME,\c"
    echo -e "${hostsArray[$index]},\c"
    echo -e "$CHASSIS_MODEL,\c"
    echo -e "$CHASSIS_SERIAL,\c"

    # This part of the script uses the service module count and module number obtained ear
    # While this code may look repetative, it is necessary to ensure the output of the scr
    count=0
    while [ "$count" -lt "$SER_COUNT" ]
    do
      SER_MODEL[$count]=$(snmpwalk -Ov -Oq -v 2c -c $SNMP_STRING ${hostsArray[$index]} 1.3
      echo -e " ${SER_MODEL[$count]}\c"
      let "count = $count + 1"
    done
    echo -e ",\c"

    count=0
    while [ "$count" -lt "$SER_COUNT" ]
```

The IBN Framework

Intent-based Networking



Cisco Meraki Guiding Principles

SIMPLICITY FIRST

Technology that simply works.

DASHBOARD LED

DEVELOPER READY

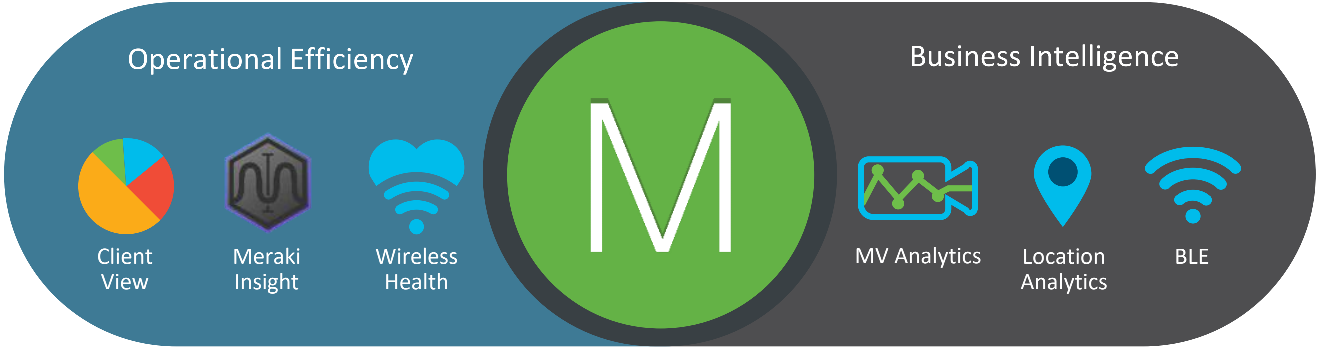
We're giving away $1,000,000 of gear to developers to use our APIs to automate IT and marketing.

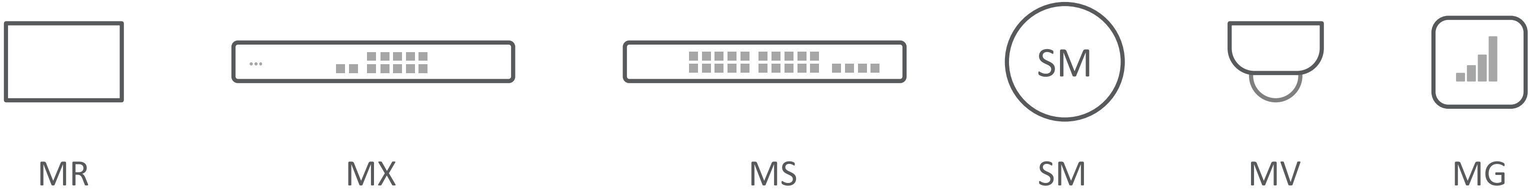
Top App Developers by Solution

App Developers by Industry

Search all developers and sample code

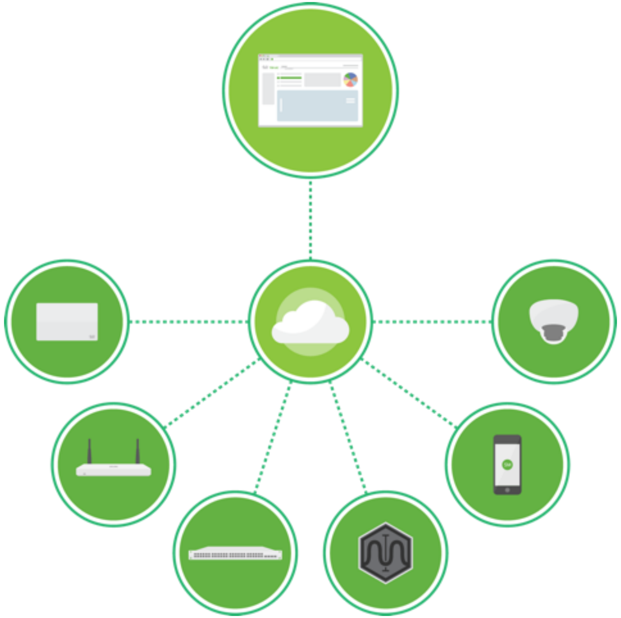
Intent Based Networking with Cisco Meraki





Simplicity

Simplifying IT with Cloud Management



A complete cloud managed IT solution

Wireless, switching, security, SD-WAN, intelligent network insights, endpoint management, and security cameras

Integrated hardware, software, and cloud services

Leader in cloud-managed IT

Among Cisco's fastest growing portfolios

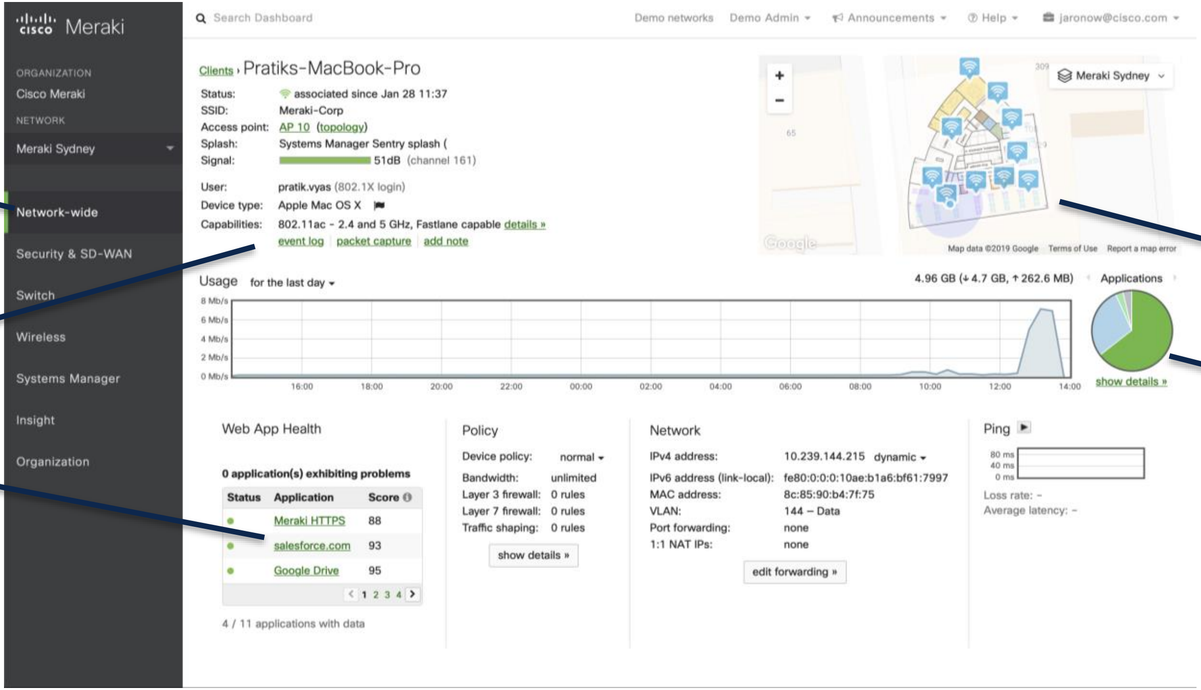
420k+	5.7M+	23M+
Unique customers	Meraki devices online	API calls per day

Intuitive Web-based Dashboard

Single pane of glass management

Client fingerprints

Real-time analytics



Clients › Pratiks-MacBook-Pro

Status:	associated since Jan 28 11:37
SSID:	Meraki-Corp
Access point:	AP 10 (topology)
Splash:	Systems Manager Sentry splash (
Signal:	51dB (channel 161)
User:	pratik.vyas (802.1X login)
Device type:	Apple Mac OS X
Capabilities:	802.11ac - 2.4 and 5 GHz, Fastlane capable details »

event log | packet capture | add note

Usage for the last day

4.96 GB (↓ 4.7 GB, ↑ 262.6 MB)

Web App Health

0 application(s) exhibiting problems

Status	Application	Score
●	Meraki HTTPS	88
●	salesforce.com	93
●	Google Drive	95

< 1 2 3 4 >

4 / 11 applications with data

Policy

Device policy:	normal
Bandwidth:	unlimited
Layer 3 firewall:	0 rules
Layer 7 firewall:	0 rules
Traffic shaping:	0 rules

show details »

Network

IPv4 address:	10.239.144.215 dynamic
IPv6 address (link-local):	fe80:0:0:0:10ae:b1a6:bf61:7997
MAC address:	8c:85:90:b4:7f:75
VLAN:	144 – Data
Port forwarding:	none
1:1 NAT IPs:	none

edit forwarding »

Ping

Loss rate: -

Average latency: -

Client location

Usage Monitoring

The Cloud increases IT efficiency

MANAGEABILITY

SCALABILITY

COST SAVINGS

Turnkey installation and management

Integrated, always up to date features

Scales from small branches to large networks

Reduces operational costs

Dashboard Demo

Security

Security as an Architecture

User and device aware security

UTM and Content Security

Umbrella Integration

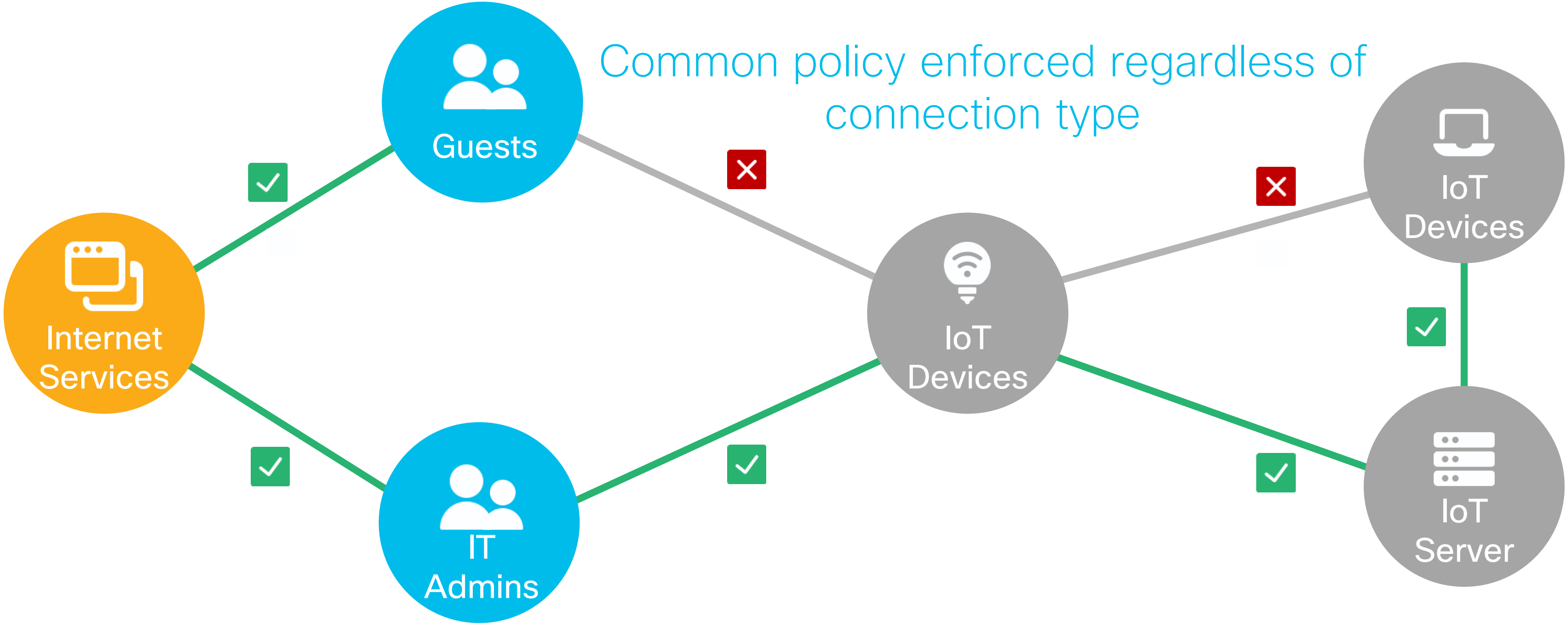
Air Marshal WIDS / WIPS

802.1x with Identity Services Engine

Adaptive Policy

Trustworthy Systems

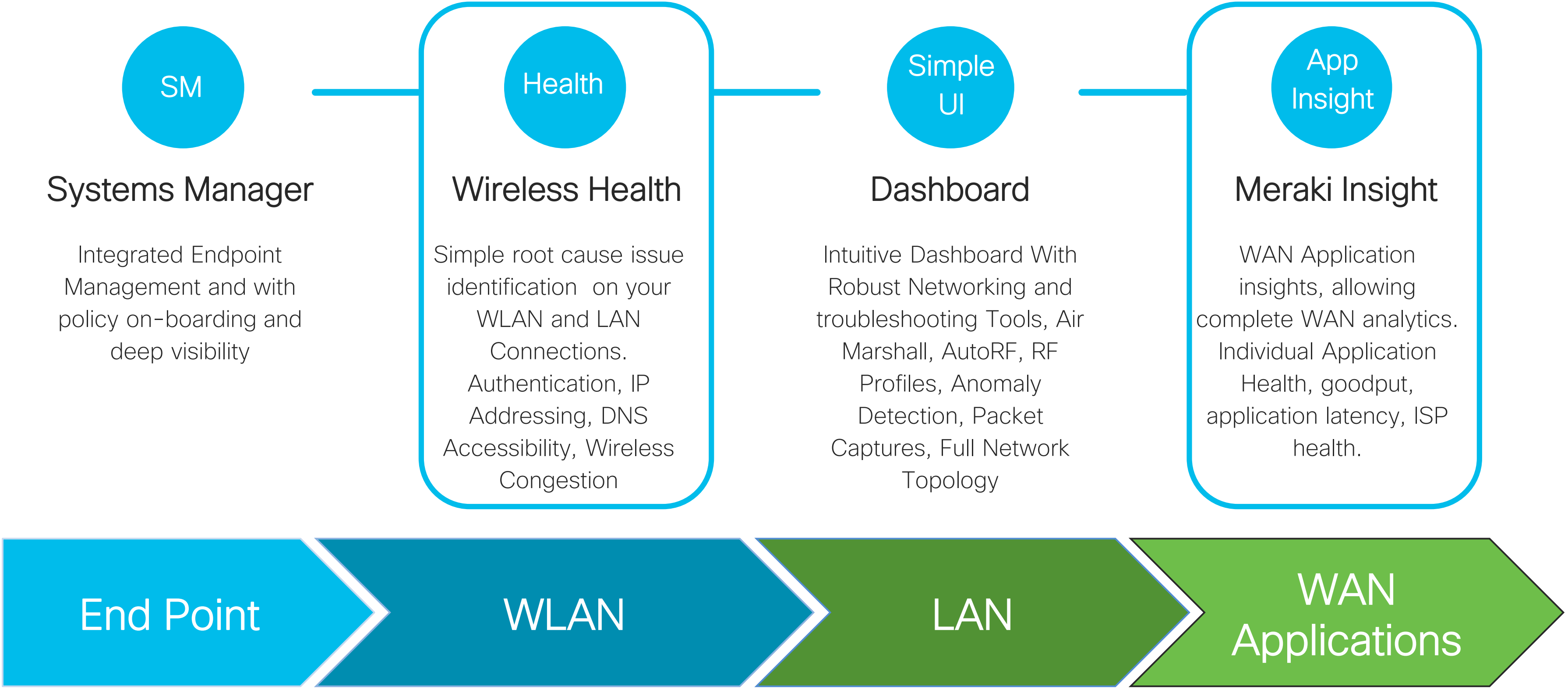
Adaptive Policy



Dashboard Demo

Assurance

Assurance across the Meraki Full Stack



SM

Systems Manager

Integrated Endpoint Management and with policy on-boarding and deep visibility

Health

Wireless Health

Simple root cause issue identification on your WLAN and LAN Connections. Authentication, IP Addressing, DNS Accessibility, Wireless Congestion

Simple UI

Dashboard

Intuitive Dashboard With Robust Networking and troubleshooting Tools, Air Marshall, AutoRF, RF Profiles, Anomaly Detection, Packet Captures, Full Network Topology

App Insight

Meraki Insight

WAN Application insights, allowing complete WAN analytics. Individual Application Health, goodput, application latency, ISP health.

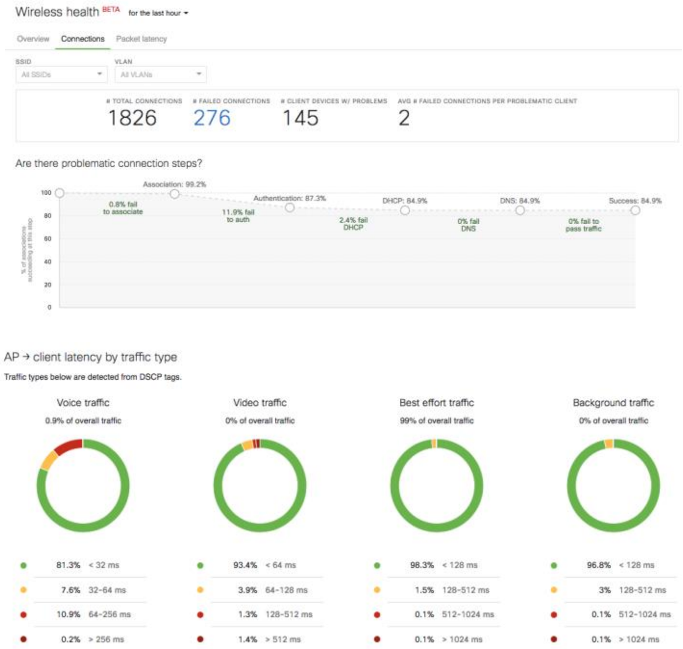
End Point

WLAN

LAN

WAN Applications

Wireless Health: Assurance for Meraki Wireless



Wireless health BETA for the last hour

Overview | Connections | Packet latency

SSID: All SSIDs
VLAN: All VLANs

# TOTAL CONNECTIONS	# FAILED CONNECTIONS	# CLIENT DEVICES W/ PROBLEMS	AVG # FAILED CONNECTIONS PER PROBLEMATIC CLIENT
1826	276	145	2

Are there problematic connection steps?

AP → client latency by traffic type

Traffic types below are detected from DSCP tags.

Voice traffic
0.9% of overall traffic

●	81.3%	< 32 ms
●	7.6%	32-64 ms
●	10.9%	64-256 ms
●	0.2%	> 256 ms

Video traffic
0% of overall traffic

●	93.4%	< 64 ms
●	3.9%	64-128 ms
●	1.3%	128-512 ms
●	1.4%	> 512 ms

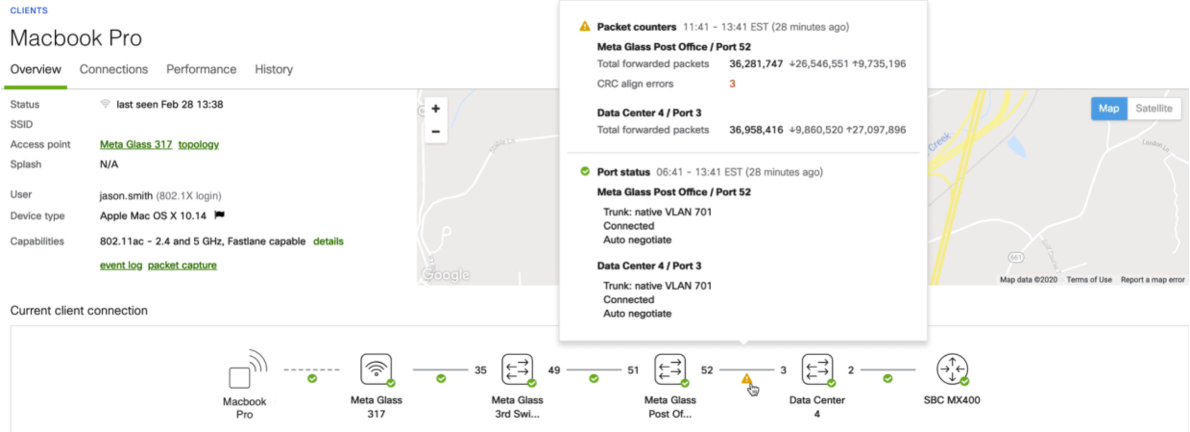
Best effort traffic
99% of overall traffic

●	98.3%	< 128 ms
●	1.5%	128-512 ms
●	0.1%	512-1024 ms
●	0.1%	> 1024 ms

Background traffic
0% of overall traffic

●	96.8%	< 128 ms
●	3%	128-512 ms
●	0.1%	512-1024 ms
●	0.1%	> 1024 ms

Meraki Wireless Health drastically reduces time needed to narrow troubleshooting scope.



CLIENTS

Macbook Pro

Overview | Connections | Performance | History

Status	last seen Feb 28 13:38
SSID	
Access point	Meta Glass 317 topology
Splash	N/A
User	jason.smith (802.1X login)
Device type	Apple Mac OS X 10.14
Capabilities	802.11ac - 2.4 and 5 GHz, Fastlane capable details
	event log packet capture

Packet counters 11:41 - 13:41 EST (28 minutes ago)

Meta Glass Post Office / Port 52
Total forwarded packets 36,281,747 ↓26,546,551 ↑9,735,196
CRC align errors 3

Data Center 4 / Port 3
Total forwarded packets 36,958,416 ↓9,860,520 ↑27,097,896

Port status 06:41 - 13:41 EST (28 minutes ago)

Meta Glass Post Office / Port 52
Trunk: native VLAN 701
Connected
Auto negotiate

Data Center 4 / Port 3
Trunk: native VLAN 701
Connected
Auto negotiate

Current client connection

Available out of the box on all MR Access Points

Meraki Insight: WAN Health

Quickly Identify downed uplinks

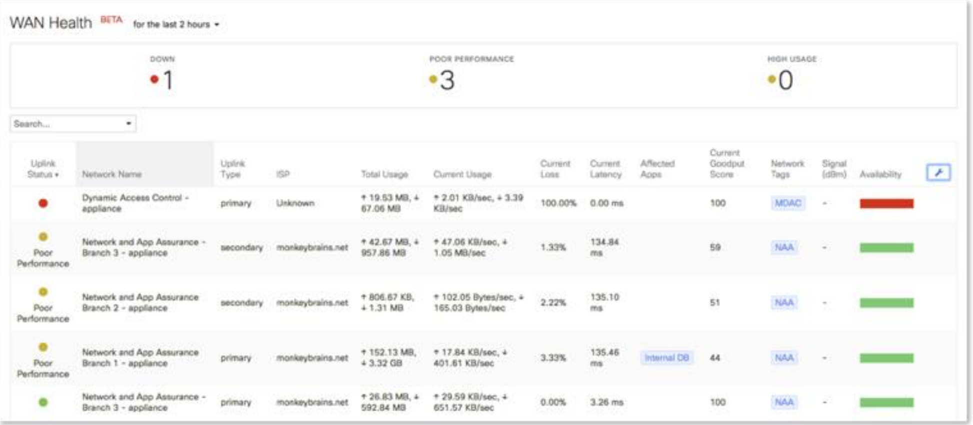
Including Cellular across all sites.

Monitor Signal Strength

Across all cellular location

Isolate underperforming uplink

Make the case for switching the ISP

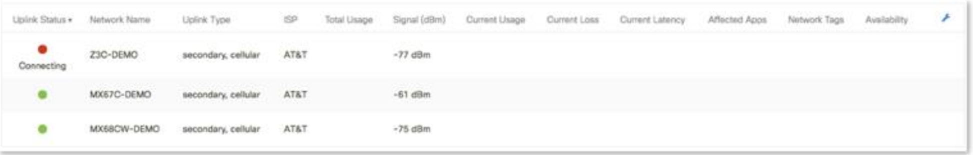


WAN Health BETA for the last 2 hours ▾

DOWN ● 1 | POOR PERFORMANCE ● 3 | HIGH USAGE ● 0

Search... ▾

Uplink Status ▾	Network Name	Uplink Type	ISP	Total Usage	Current Usage	Current Loss	Current Latency	Affected Apps	Current Goodput Score	Network Tags	Signal (dBm)	Availability
●	Dynamic Access Control - appliance	primary	Unknown	↑ 19.53 MB, ↓ 67.06 MB	↑ 2.01 KB/sec, ↓ 3.39 KB/sec	100.00%	0.00 ms		100	MDAC	-	🟥
● Poor Performance	Network and App Assurance - Branch 3 - appliance	secondary	monkeybrains.net	↑ 42.67 MB, ↓ 957.86 MB	↑ 47.06 KB/sec, ↓ 1.05 MB/sec	1.33%	134.84 ms		59	NAA	-	🟩
● Poor Performance	Network and App Assurance Branch 2 - appliance	secondary	monkeybrains.net	↑ 806.67 KB, ↓ 1.31 MB	↑ 102.05 Bytes/sec, ↓ 165.03 Bytes/sec	2.22%	135.10 ms		51	NAA	-	🟩
● Poor Performance	Network and App Assurance Branch 1 - appliance	primary	monkeybrains.net	↑ 152.13 MB, ↓ 3.32 GB	↑ 17.84 KB/sec, ↓ 401.61 KB/sec	3.33%	135.46 ms	Internal DB	44	NAA	-	🟩
●	Network and App Assurance - Branch 3 - appliance	primary	monkeybrains.net	↑ 26.83 MB, ↓ 592.84 MB	↑ 29.59 KB/sec, ↓ 651.57 KB/sec	0.00%	3.26 ms		100	NAA	-	🟩



Uplink Status ▾	Network Name	Uplink Type	ISP	Total Usage	Signal (dBm)	Current Usage	Current Loss	Current Latency	Affected Apps	Network Tags	Availability
● Connecting	Z3C-DEMO	secondary, cellular	AT&T		-77 dBm						
●	MX67C-DEMO	secondary, cellular	AT&T		-61 dBm						
●	MX68CW-DEMO	secondary, cellular	AT&T		-75 dBm						

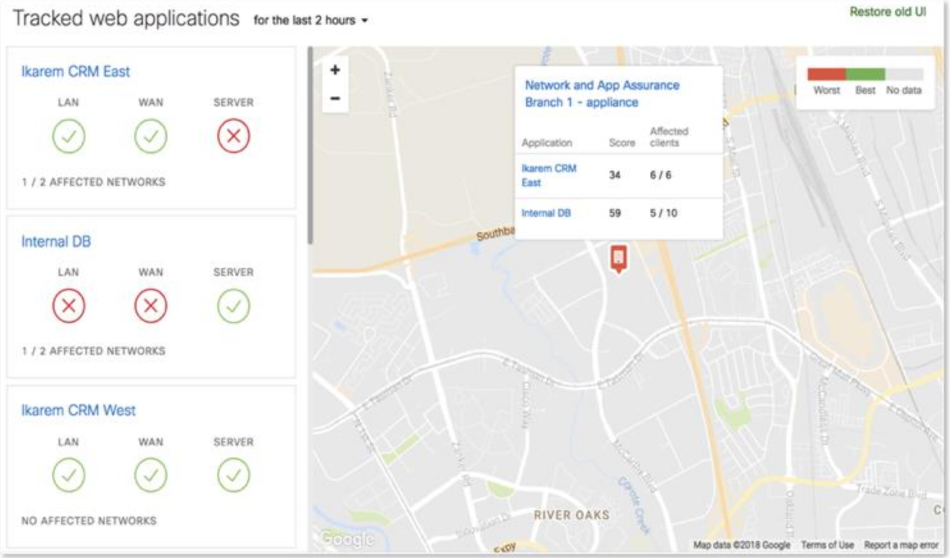
Meraki Insight: Application Health

End-to-End Visibility
For SaaS Applications

Application Performance
Monitor apps traveling over VPN or public internet

Network Performance Analytics
LAN, WAN, Servers, Domains, Clients

Accelerate IT
Reduce time-to-resolution



Tracked web applications for the last 2 hours ▾

Restore old UI

Ikarem CRM East

LAN	WAN	SERVER
✓	✓	✕

1 / 2 AFFECTED NETWORKS

Internal DB

LAN	WAN	SERVER
✕	✕	✓

1 / 2 AFFECTED NETWORKS

Ikarem CRM West

LAN	WAN	SERVER
✓	✓	✓

NO AFFECTED NETWORKS

Network and App Assurance Branch 1 - appliance

Application	Score	Affected clients
Ikarem CRM East	34	6 / 6
Internal DB	59	5 / 10

Dashboard Demo

Cisco DNA Center Integration

Cisco DNA Center – Meraki Integration

Version 1.1

- Starting point of integration between Cisco's access platforms
- Single Dashboard inventory visibility across all platforms (Meraki, Catalyst, ISR, ASR, N7K, Aironet)
- API driven dashboard integration

✓

Version 1.2-1.3.3

- Combined Topology mapping for Hybrid environments along with Up/Down status notification for Meraki devices
- SSID Provisioning

✓

Version 1.4+

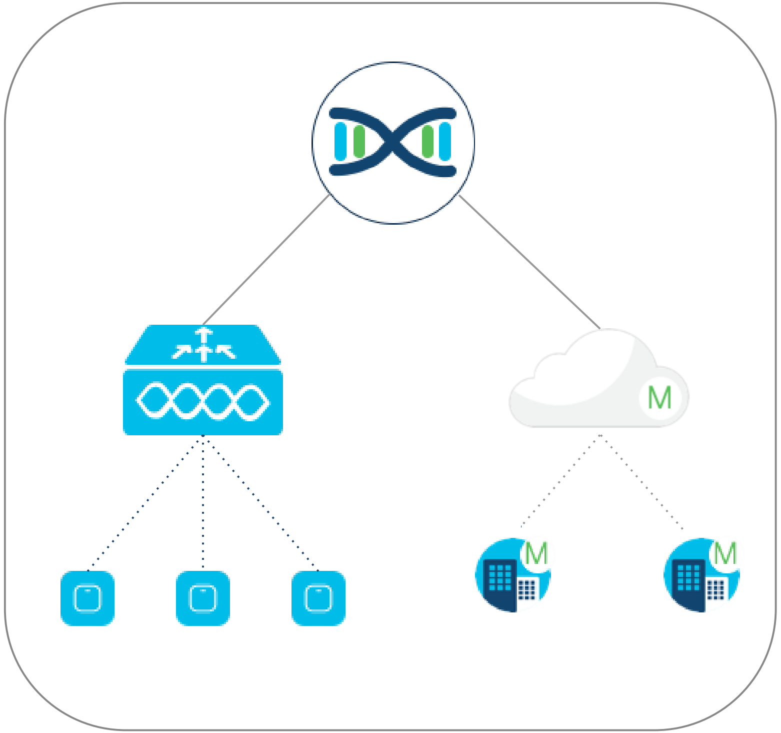
- Meraki Wireless Health data integrated into DNA Center Assurance

Cisco DNA Center 1.3.3 – SSID Provisioning

Single interface for SSID provisioning across Catalyst and Meraki

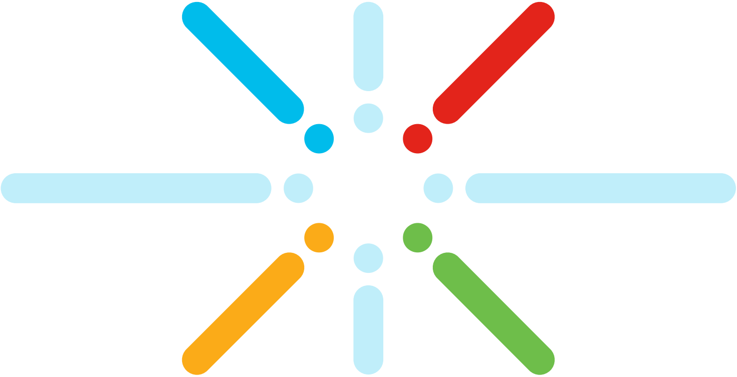
Supports WPA2-Enterprise, WPA2-PSK, and open SSIDs

Builds dashboard networks that map to sites in Cisco DNA Center



Summary

- Intent Based Networking
- Simplicity with Cisco Meraki
- Security as an Architecture
- Assurance for contextual insights
- Cisco DNA Center Integration



You make networking **possible**

Thank you

You make **possible**