TOMORROW starts here.

CISCO

Cisco live!

Cloud Managed Security with Meraki MX

BRKSEC-2900

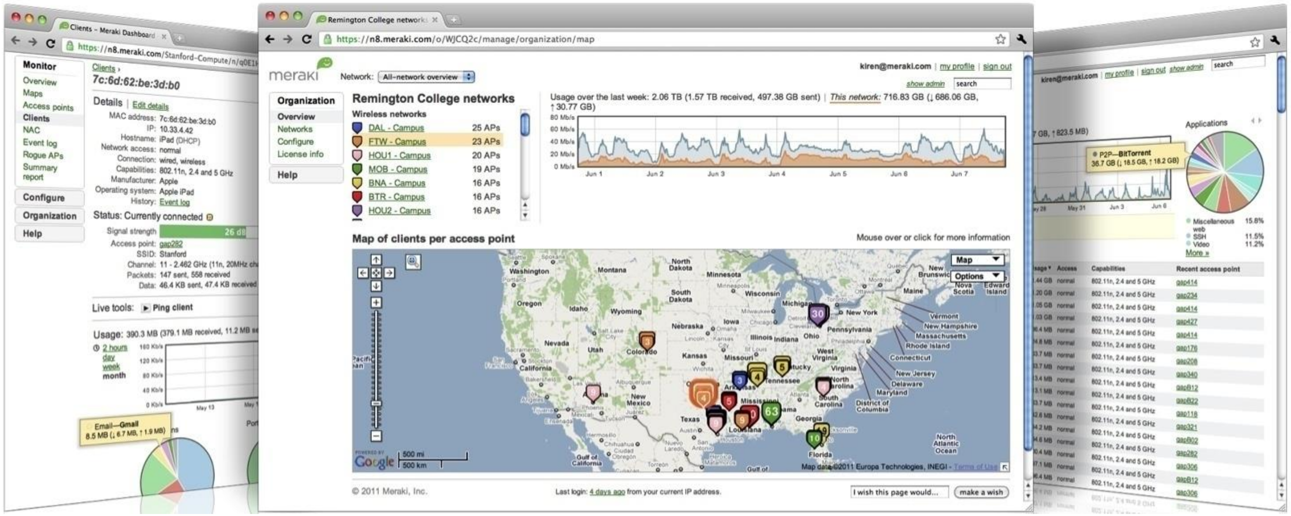
John-Paul Sikking

Security Specialist

Agenda

- Introduction
- Why cloud managed networking?
- Cloud-managed networking architecture
- Solution highlights
- Product Families
- Out of the box demo
- Q+A

Bringing The Cloud To Enterprise Networks



Clients - Meraki Dashboard

https://n8.meraki.com/Stanford-Compute/n/q0E1

Monitor: Overview, Maps, Access points, Clients, NAC, Event log, Rogue APs, Summary report

Configure

Organization

Help

Clients ›

7c:6d:62:be:3d:b0

Details | Edit details

MAC address: 7c:6d:62:be:3d:b0
IP: 10.33.4.42
Hostname: iPad (DHCP)
Network access: normal
Connection: wired, wireless
Capabilities: 802.11n, 2.4 and 5 GHz
Manufacturer: Apple
Operating system: Apple iPad
History: Event log

Status: Currently connected

Signal strength: 26 dB
Access point: gap282
SSID: Stanford
Channel: 11 - 2.462 GHz (11n, 20MHz ch
Packets: 147 sent, 558 received
Data: 46.4 KB sent, 47.4 KB received

Live tools: ▶ Ping client

Usage: 390.3 MB (379.1 MB received, 11.2 MB se

2 hours / day / week / month

Email—Gmail
8.5 MB (↓ 6.7 MB, ↑ 1.9 MB)

Remington College networks

https://n8.meraki.com/o/WJCQ2c/manage/organization/map

meraki

Network: All-network overview

kiren@meraki.com | my profile | sign out

show admin | search

Organization: Overview, Networks, Configure, License info

Help

Remington College networks

Wireless networks

DAL - Campus	25 APs
FTW - Campus	23 APs
HOU1 - Campus	20 APs
MOB - Campus	19 APs
BNA - Campus	16 APs
BTR - Campus	16 APs
HOU2 - Campus	16 APs

Usage over the last week: 2.06 TB (1.57 TB received, 497.38 GB sent) | *This network:* 716.83 GB (↓ 686.06 GB, ↑ 30.77 GB)

Map of clients per access point

Mouse over or click for more information

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Last login: 4 days ago from your current IP address.

I wish this page would... | make a wish

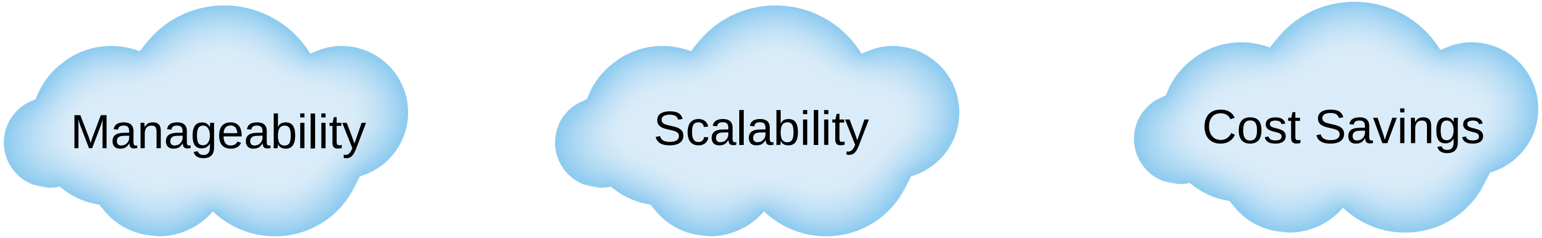
Cisco Meraki: 100% Cloud-Managed Networking

- Cisco Meraki: a complete cloud-managed networking solution
  - Wireless, switching, security and MDM, centrally managed over the web
  - Built from the ground up for cloud management
  - Integrated hardware, software, and cloud services
- Leader in cloud-managed networking
  - Among Cisco’s fastest-growing portfolios: over 100% annual growth
  - Tens of millions of devices connected worldwide since 2006
- Recognised for innovation
  - Gartner Magic Quadrant, InfoWorld Technology of the Year, CRN Coolest Technologies

Trusted by thousands of customers worldwide:

Why Cloud Managed Networking?

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

An Integrated Solution For New IT Challenges

1 billion iOS & Android devices

HD video and rich media

New business opportunities

Integrated mobile device management

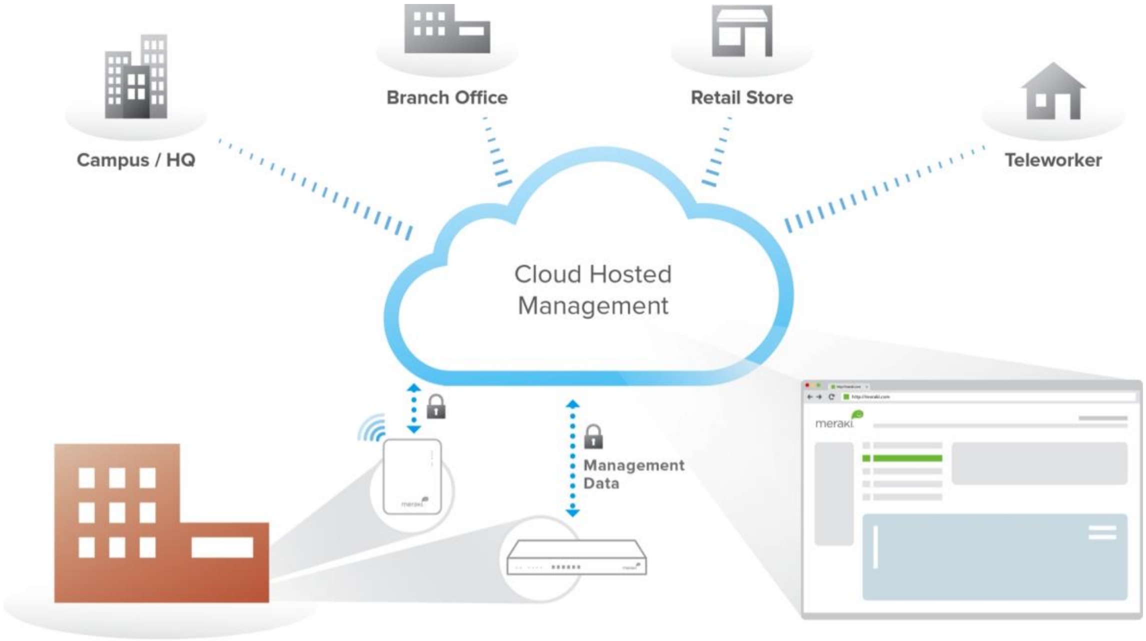
Layer 7 application shaping

Analytics and user engagement

A complete solution out of the-box:
No extra hardware, software, or complexity

Cloud Architecture

Cloud-Managed Networking Architecture



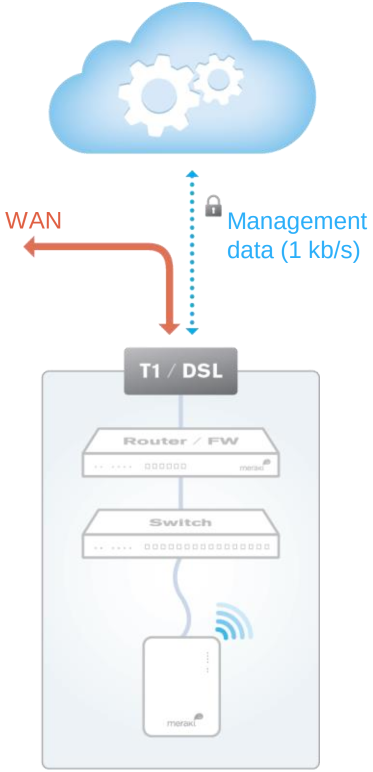
Network endpoints securely connected to the cloud

Cloud-hosted centralised management platform

Intuitive browser-based dashboard

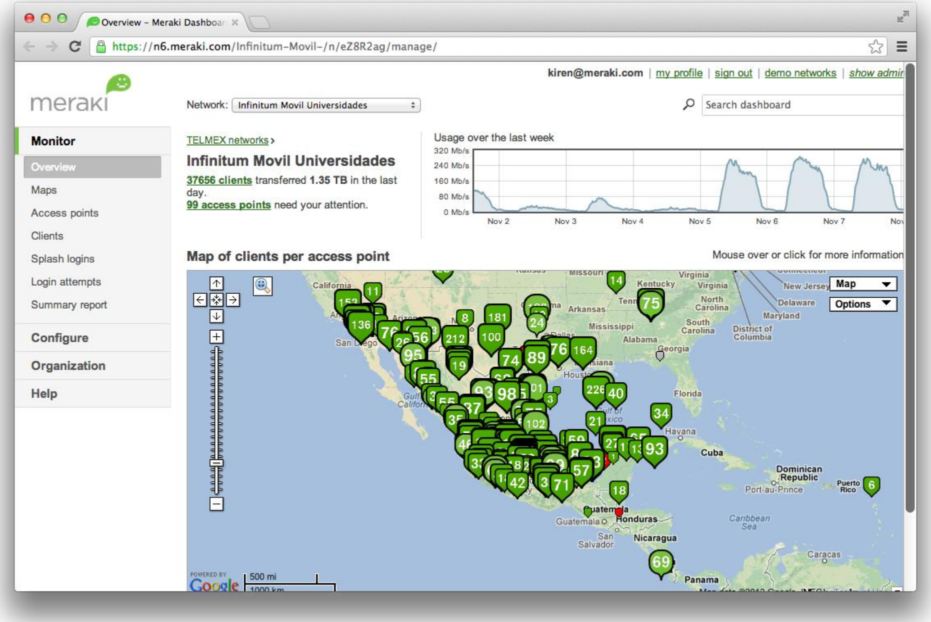
Out Of Band Cloud Management In Every Product

- Scalable
  - Unlimited throughput, no bottlenecks
  - Add devices or sites in minutes
- Reliable
  - Highly available cloud with multiple Data Centres
  - Network functions even if connection to cloud is interrupted
  - 99.99% uptime SLA
- Secure
  - No user traffic passes through cloud
  - Fully HIPAA / PCI compliant (level 1 certified)
  - 3rd party security audits, daily penetration testing
  - Automatic firmware and security updates (user-scheduled)



Reliability and security information at meraki.cisco.com/trust

Scalable Cloud Infrastructure



Overview – Meraki Dashboar

https://n6.meraki.com/Infinitum-Movil-/n/eZ8R2ag/manage/

kiren@meraki.com | my profile | sign out | demo networks | show admir

meraki

Network: Infinitum Movil Universidades

Search dashboard

Monitor
- Overview
- Maps
- Access points
- Clients
- Splash logins
- Login attempts
- Summary report

Configure

Organization

Help

TELMEX networks ›

Infinitum Movil Universidades

37656 clients transferred **1.35 TB** in the last day.
99 access points need your attention.

Usage over the last week

Map of clients per access point

Mouse over or click for more information

Telmex

Nationwide hotspot and 3G offload network

Dress Barn

Nation-wide deployment spanning hundreds of retail stores

Motel 6

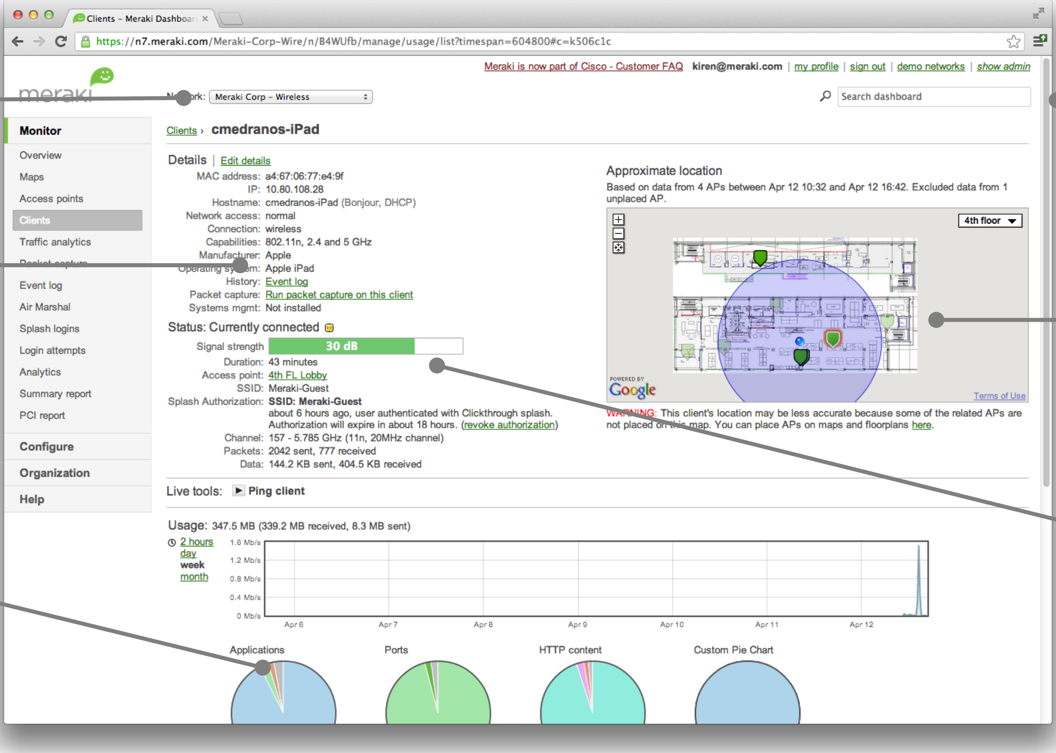
70,000 hotel room deployment

Jeffco School District

80,000 student district with 100+ schools

Proven in 10,000+ endpoint deployments

Intuitive Web-Based Dashboard



Clients – Meraki Dashboard

https://n7.meraki.com/Meraki-Corp-Wire/n/B4WUfb/manage/usage/list?timespan=604800#c=k506c1c

Meraki is now part of Cisco - Customer FAQ | kiren@meraki.com | my profile | sign out | demo networks | show admin

meraki

Network: Meraki Corp – Wireless

Search dashboard

Monitor

- Overview
- Maps
- Access points
- Clients
- Traffic analytics
- Packet capture
- Event log
- Air Marshal
- Splash logins
- Login attempts
- Analytics
- Summary report
- PCI report

Configure

Organization

Help

Clients › **cmedranos-iPad**

Details | Edit details

```
          MAC address: a4:67:06:77:e4:9f
                   IP: 10.80.108.28
             Hostname: cmedranos-iPad (Bonjour, DHCP)
       Network access: normal
           Connection: wireless
         Capabilities: 802.11n, 2.4 and 5 GHz
         Manufacturer: Apple
     Operating system: Apple iPad
              History: Event log
       Packet capture: Run packet capture on this client
         Systems mgmt: Not installed
```

Status: Currently connected

```
      Signal strength 30 dB
            Duration: 43 minutes
        Access point: 4th FL Lobby
                SSID: Meraki-Guest
 Splash Authorization: SSID: Meraki-Guest
                      about 6 hours ago, user authenticated with Clickthrough splash.
                      Authorization will expire in about 18 hours. (revoke authorization)
             Channel: 157 - 5.785 GHz (11n, 20MHz channel)
             Packets: 2042 sent, 777 received
                Data: 144.2 KB sent, 404.5 KB received
```

Approximate location

Based on data from 4 APs between Apr 12 10:32 and Apr 12 16:42. Excluded data from 1 unplaced AP.

WARNING: This client's location may be less accurate because some of the related APs are not placed on this map. You can place APs on maps and floorplans here.

Live tools: ▶ Ping client

Usage: 347.5 MB (339.2 MB received, 8.3 MB sent)

2 hours
day
week
month

Wired + wireless

Client fingerprints

Application QoS

Instant search

Location analytics

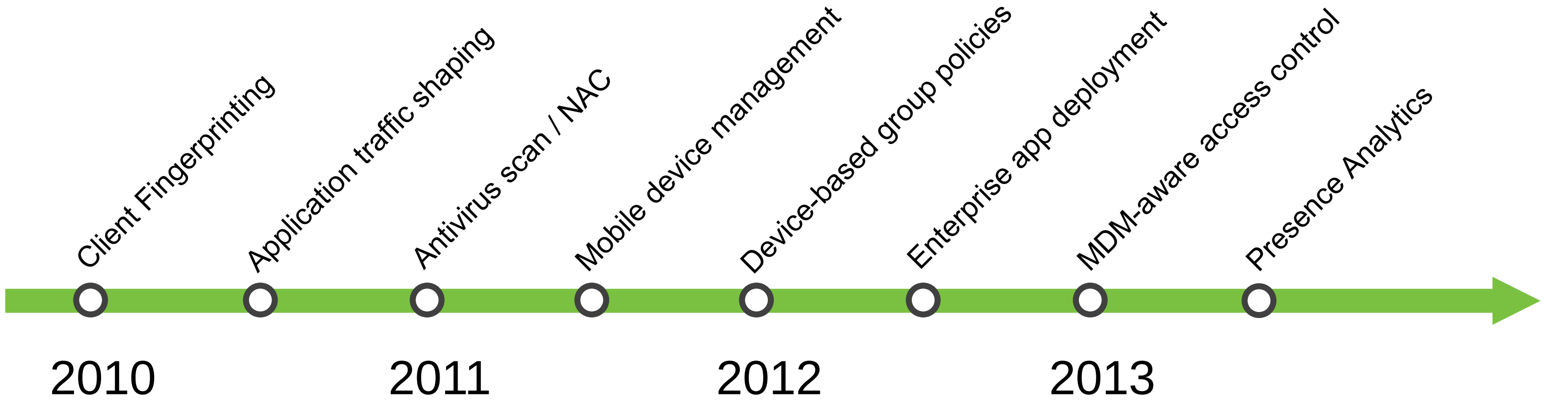
Real-time control

Cisco live!

SaaS Feature Delivery

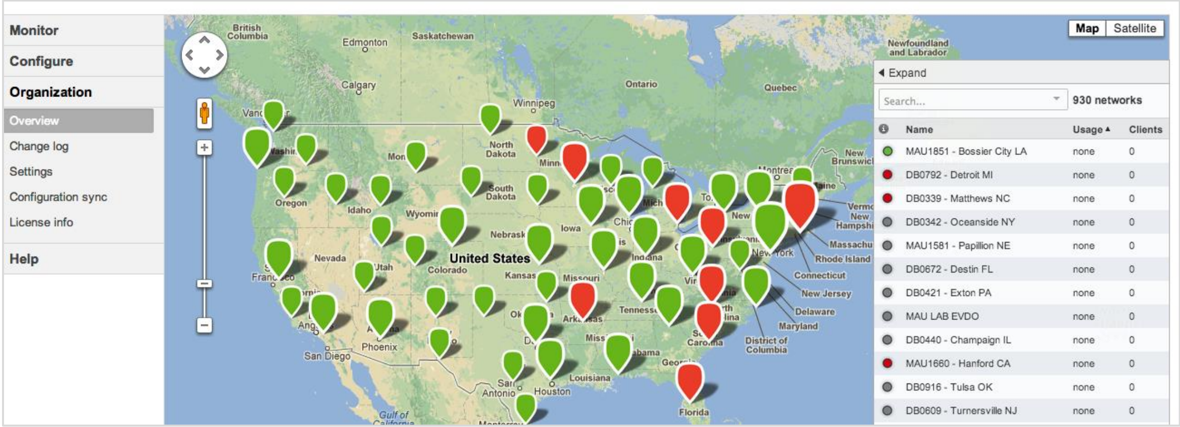
- Feature updates seamlessly delivered from the cloud (user-scheduled)
- Adapts to new devices, applications, and business opportunities

BYOD feature velocity, past 36 months:



Solution Highlights

Distributed Networks



	Name	Usage ▲	Clients
🟢	MAU1851 - Bossier City LA	none	0
🔴	DB0792 - Detroit MI	none	0
🔴	DB0339 - Matthews NC	none	0
●	DB0342 - Oceanside NY	none	0
●	MAU1581 - Papillion NE	none	0
●	DB0672 - Destin FL	none	0
●	DB0421 - Exton PA	none	0
●	MAU LAB EVDO	none	0
●	DB0440 - Champaign IL	none	0
🔴	MAU1660 - Hanford CA	none	0
●	DB0916 - Tulsa OK	none	0
●	DB0609 - Turnersville NJ	none	0

Centralised cloud management scales to thousands of sites

Multi-site visibility and control

Map-based dashboard; configuration sync; remote diagnostics; automatic monitoring and alerts

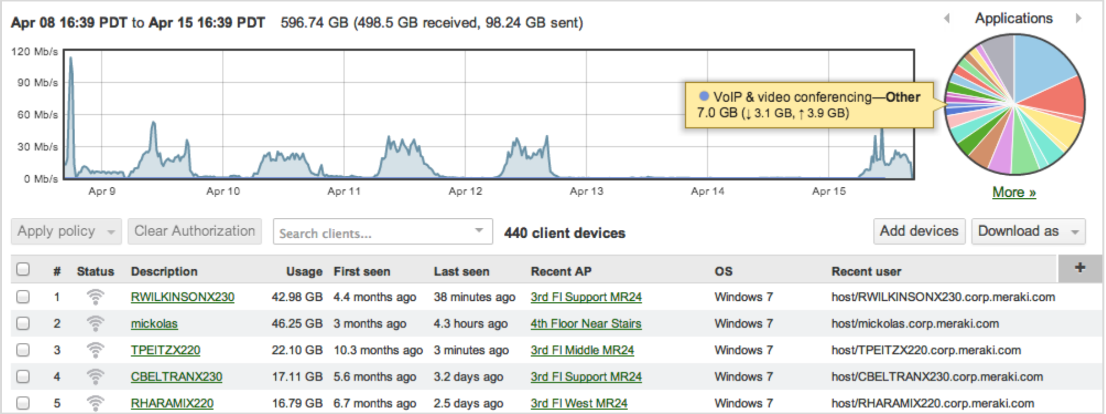
Zero-touch provisioning

Devices automatically provision from the cloud, no staging required; self-configuring site-to-site VPN

Traffic acceleration

WAN optimisation and web caching accelerates and de-duplicates network traffic; application-aware QoS prioritises productivity apps

High Capacity Edge Networks



Apr 08 16:39 PDT to **Apr 15 16:39 PDT** 596.74 GB (498.5 GB received, 98.24 GB sent)

● VoIP & video conferencing—**Other**
7.0 GB (↓ 3.1 GB, ↑ 3.9 GB)

440 client devices

□	#	Status	Description	Usage	First seen	Last seen	Recent AP	OS	Recent user
□	1		RWILKINSONX230	42.98 GB	4.4 months ago	38 minutes ago	3rd Fl Support MR24	Windows 7	host/RWILKINSONX230.corp.meraki.com
□	2		mickolas	46.25 GB	3 months ago	4.3 hours ago	4th Floor Near Stairs	Windows 7	host/mickolas.corp.meraki.com
□	3		TPEITZX220	22.10 GB	10.3 months ago	3 minutes ago	3rd Fl Middle MR24	Windows 7	host/TPEITZX220.corp.meraki.com
□	4		CBELTRANX230	17.11 GB	5.6 months ago	3.2 days ago	3rd Fl Support MR24	Windows 7	host/CBELTRANX230.corp.meraki.com
□	5		RHARAMIX220	16.79 GB	6.7 months ago	2.5 days ago	3rd Fl West MR24	Windows 7	host/RHARAMIX220.corp.meraki.com

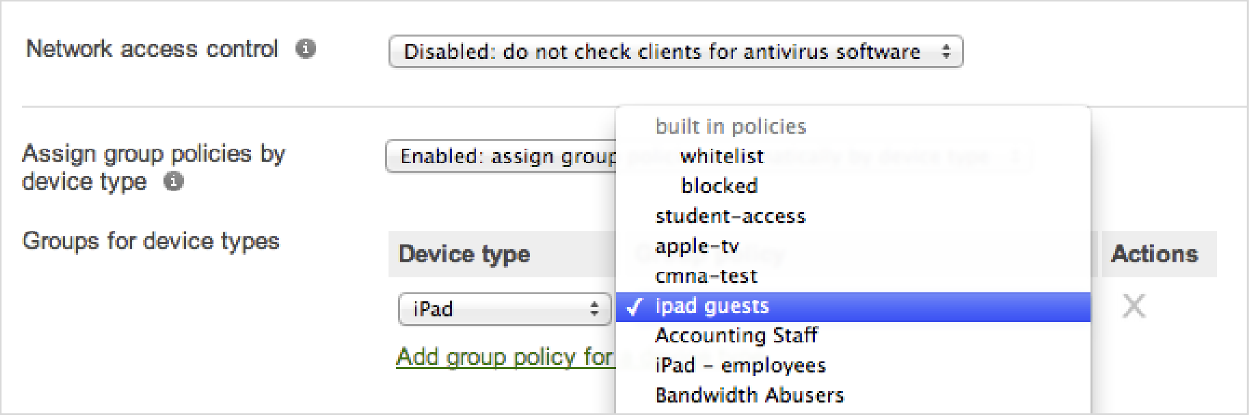
RF optimisation and application-aware QoS for high-throughput, high-density WLAN

Layer 7 application traffic shaping Throttle, block, or prioritise application traffic with DPI-based fingerprinting; set user and group-based shaping rules

Cloud-base RF optimisation Dynamically avoid interference, optimising channel selection and power levels

Density-optimised WLAN RF platform tuned for airtime fairness and performance in dense performance-critical environments

Bring Your Own Device (BYOD)



Network access control: Disabled: do not check clients for antivirus software

Assign group policies by device type: Enabled: assign group

Groups for device types

Device type		Actions
iPad	✓ ipad guests	X

Add group policy for

- built in policies
  - whitelist
  - blocked
- student-access
- apple-tv
- cmna-test
- ✓ ipad guests
- Accounting Staff
- iPad – employees
- Bandwidth Abusers

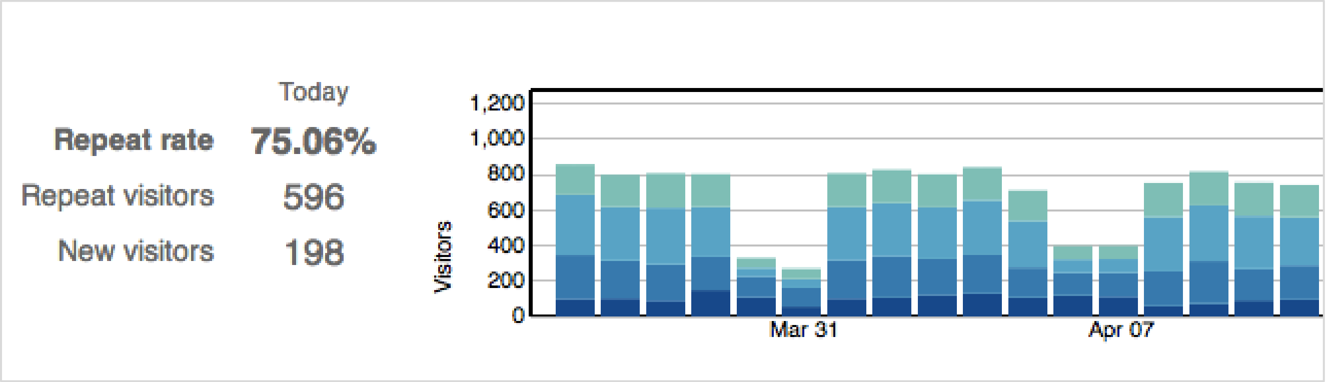
Out-of-the-box security, management, and capacity for BYOD-ready deployments

Device-aware security
Device-aware firewall and access control; Antivirus scan; LAN isolation; Bonjour Gateway; Content and security filtering

Integrated MDM
Enforce encryption, passcodes, and device restrictions; Deploy enterprise applications; Remotely lock or wipe devices

Simplified onboarding
Flexible authentication with AD integration, SMS authentication, hosted splash pages, and automatic MDM enrollment

User Analytics And Engagement



	Today
Repeat rate	**75.06%**
Repeat visitors	596
New visitors	198

Built-in location analytics dashboard

Optimise marketing and business operations

Analyse capture rate, dwell time, and new / repeat visitors to measure advertising, promotions, site utilisation, etc.

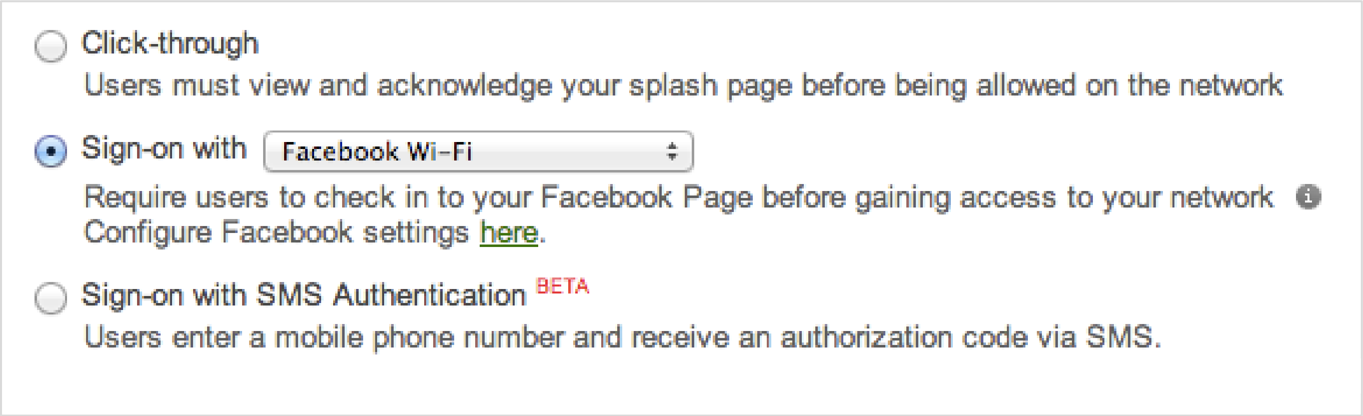
Built-in analytics

Integrated into WLAN, no extra sensors, appliances, or software

Extensible API

Integrate location data with CRM, loyalty programs, and custom applications for targeted real-time offers

Flexible Authentication And Access Control



○ Click-through

Users must view and acknowledge your splash page before being allowed on the network

● Sign-on with Facebook Wi-Fi

Require users to check in to your Facebook Page before gaining access to your network
Configure Facebook settings here.

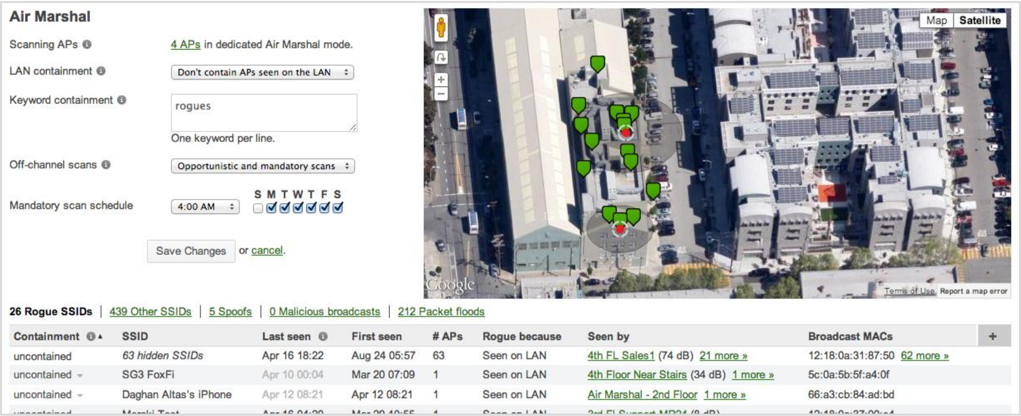
○ Sign-on with SMS Authentication BETA

Users enter a mobile phone number and receive an authorization code via SMS.

Flexible built-in authentication mechanisms

Flexible authentication	Secure 802.1x and Active Directory authentication; Facebook Authentication for branding and targeted social marketing; SMS self-service authentication, Lobby Ambassador, and hosted sign-on splash pages
Dynamic access control	Assign clients layer 3-7 firewall rules, VLANs, and application-aware quality of service by identity, group, location, or device type

Simplified Enterprise Security



Air Marshal

Scanning APs	4 APs in dedicated Air Marshal mode.
LAN containment	Don't contain APs seen on the LAN
Keyword containment	rogues One keyword per line.
Off-channel scans	Opportunistic and mandatory scans
Mandatory scan schedule	4:00 AM — S □ M ☑ T ☑ W ☑ T ☑ F ☑ S ☑

Save Changes or cancel.

26 Rogue SSIDs | 439 Other SSIDs | 5 Spoofs | 0 Malicious broadcasts | 212 Packet floods

Containment	SSID	Last seen	First seen	# APs	Rogue because	Seen by	Broadcast MACs
uncontained	*63 hidden SSIDs*	Apr 16 18:22	Aug 24 05:57	63	Seen on LAN	4th FL Sales1 (74 dB) 21 more »	12:18:0a:31:87:50 62 more »
uncontained	SG3 FoxFi	Apr 10 00:04	Mar 20 07:09	1	Seen on LAN	4th Floor Near Stairs (34 dB) 1 more »	5c:0a:5b:5f:a4:0f
uncontained	Daghan Altas's iPhone	Apr 12 08:21	Apr 12 08:21	1	Seen on LAN	Air Marshal - 2nd Floor 1 more »	66:a3:cb:84:ad:bd
uncontained	Meraki Test	Apr 16 04:20	Mar 20 10:55	1	Seen on LAN	3rd FL Support MR24 (8 dB)	12:18:0a:27:00:a4

Enterprise-class security features for security-conscious environments

Air Marshal WIDS/WIPS	Detect wireless attacks; contain rogue APs; cloud-based alerting and diagnostics
User and device aware security	User, device, and group-based firewall rules (layer 3-7) with Active Directory integration
Complete NG firewall and content security	Application firewall; content filtering matching 1B+ URLs; antivirus / antimalware filtering; Google safe-search

Product Families

MR Wireless Access Points

- 6 models including indoor / outdoor, high performance(802.11ac) and value-priced
- Enterprise-class silicon including RF optimisation, PoE, voice / video support
- Lifetime warranty on indoor APs

Feature highlights

BYOD policies

Application traffic shaping

Guest access

Enterprise security

WIDS / WIPS

Location analytics

MX Security Appliances

- 6 models scaling from small branch to campus / Data Centre
- Complete networking and security in a single appliance

Feature highlights

Zero-touch site to site VPN

WAN optimisation

NG firewall

Content filtering

WAN link bonding

Intrusion detection

MS Access And Aggregation Switches

- Gigabit access switches in 8, 24, and 48 port configurations, PoE available on all ports
- 10 Gigabit SFP+ aggregation switches in 24 and 48 port configurations
- Enterprise-class performance and reliability including non-blocking performance, voice/video QoS, and a lifetime warranty

Feature highlights

Voice and video QoS

Layer 7 app visibility

Virtual stacking

PoE / PoE + on all ports

Remote packet capture, cable testing

Systems Manager Mobile Device Management

- Device Management controls iOS, Android, Mac, and Windows devices
- Cloud-based - no on-site appliances or software, works with any vendor’s network
- 100% free - available at no cost to any organisation, sign up at meraki.cisco.com/sm

Feature highlights

Centralised app deployment

Device security

Rapid provisioning

Backpack™ file sharing

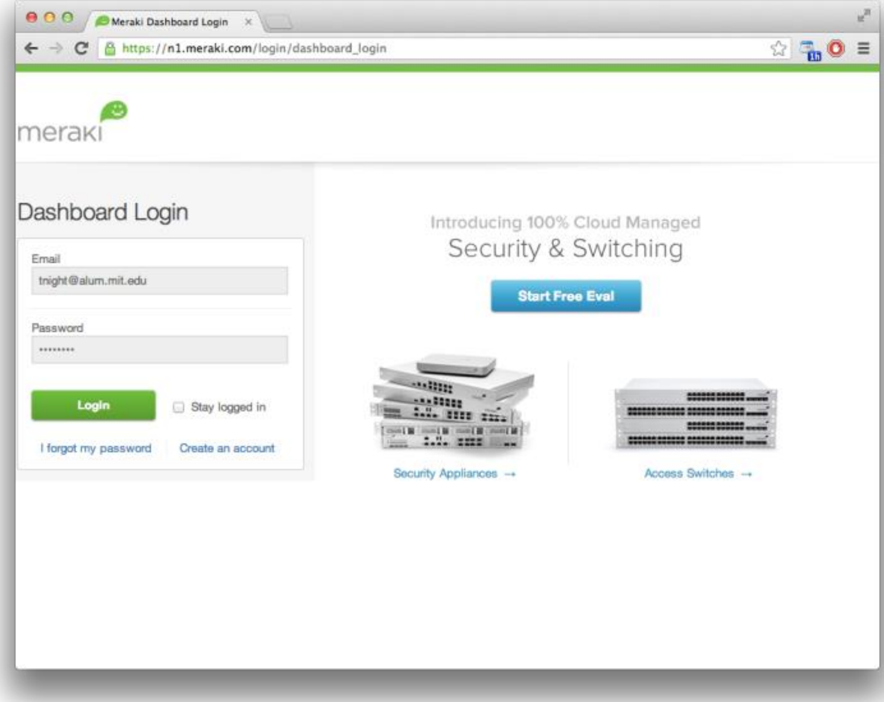
Asset management

Out of the box

Demo Use Cases – Building A Network In 30 Mins

- Setting up MX, create organisation, create networks, add devices.
- Setting up MR, set-up a quick wireless network for my iPad
- Settings:
  - Addressing / NAT / DHCP
  - Firewall rules
  - Load balancing / Traffic Shaping
  - Active Directory
  - Group Policy
  - VPN
  - Security Filtering
  - Content Filtering
  - Bonjour

FTB – Account Set-Up



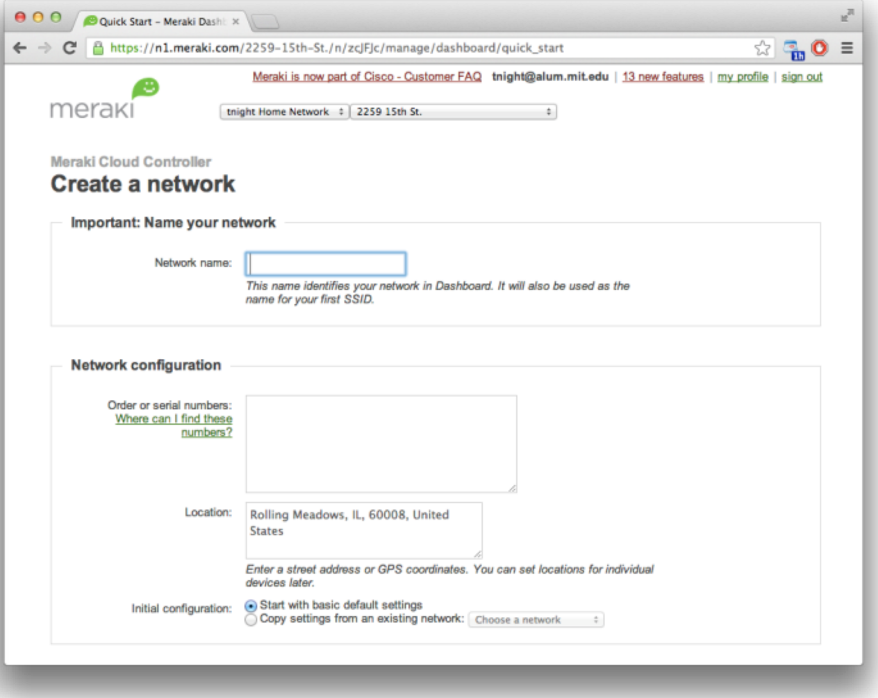
Dashboard Login

Email: tnight@alum.mit.edu

Password: ••••••••

Login □ Stay logged in

I forgot my password Create an account



Quick Start – Meraki Dash
https://n1.meraki.com/2259-15th-St./n/zcJFJc/manage/dashboard/quick_start
Meraki is now part of Cisco - Customer FAQ
tnight@alum.mit.edu | 13 new features | my profile | sign out
meraki
tnight Home Network
2259 15th St.

Meraki Cloud Controller

Create a network

Important: Name your network

Network name:

This name identifies your network in Dashboard. It will also be used as the name for your first SSID.

Network configuration

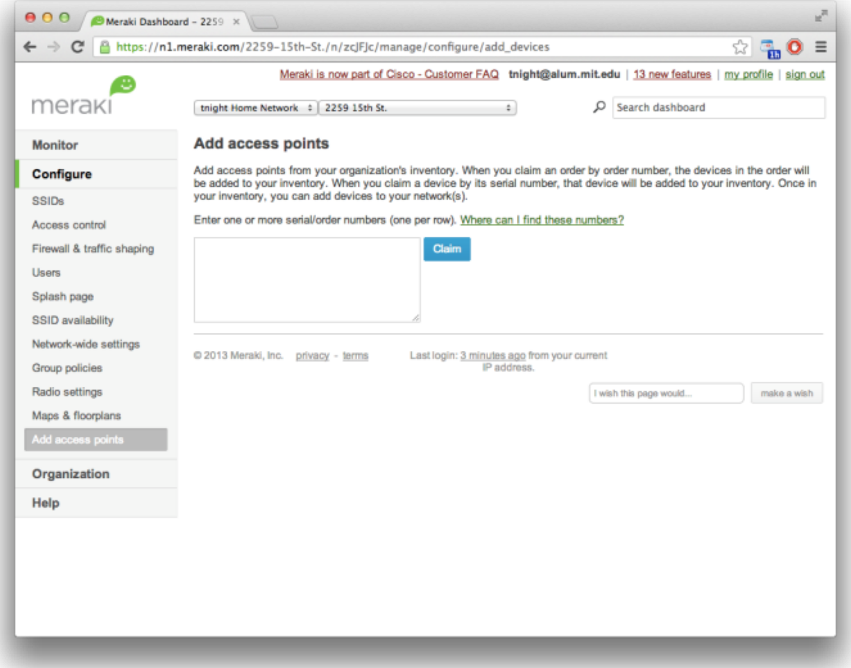
Order or serial numbers: Where can I find these numbers?

Location: Rolling Meadows, IL, 60008, United States

Enter a street address or GPS coordinates. You can set locations for individual devices later.

Initial configuration: ● Start with basic default settings
○ Copy settings from an existing network: Choose a network

FTB - Wireless: Add AP And Apply Firewalling



Meraki Dashboard - 2259
https://n1.meraki.com/2259-15th-St./n/zcJFJc/manage/configure/add_devices
Meraki is now part of Cisco - Customer FAQ | tnight@alum.mit.edu | 13 new features | my profile | sign out
meraki
tnight Home Network | 2259 15th St.
Search dashboard
Monitor
Configure
SSIDs
Access control
Firewall & traffic shaping
Users
Splash page
SSID availability
Network-wide settings
Group policies
Radio settings
Maps & floorplans
Add access points
Organization
Help

Add access points

Add access points from your organization's inventory. When you claim an order by order number, the devices in the order will be added to your inventory. When you claim a device by its serial number, that device will be added to your inventory. Once in your inventory, you can add devices to your network(s).

Enter one or more serial/order numbers (one per row). Where can I find these numbers?

Claim

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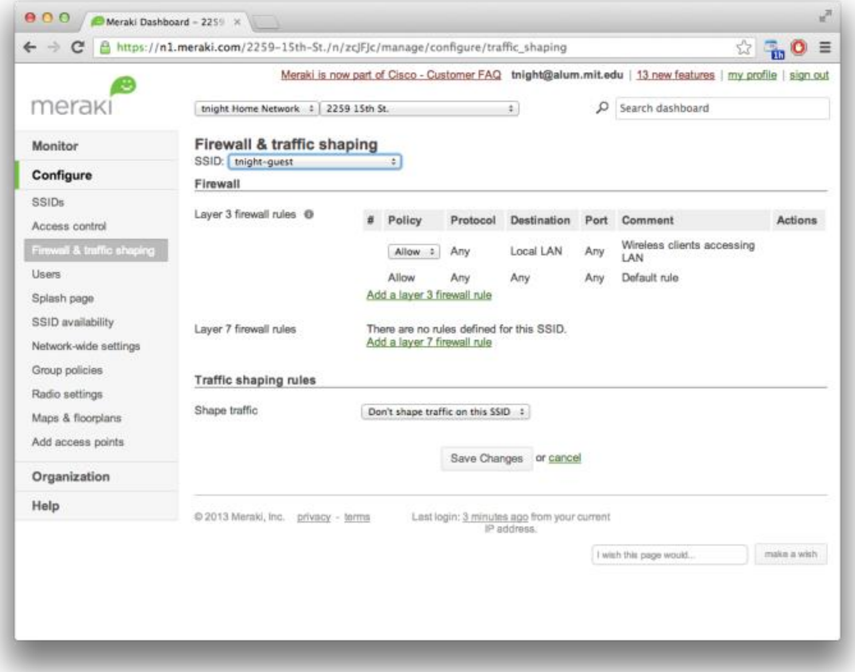
I wish this page would... | make a wish



Meraki Dashboard - 2259
https://n1.meraki.com/2259-15th-St./n/zcJFJc/manage/configure/traffic_shaping
Meraki is now part of Cisco - Customer FAQ | tnight@alum.mit.edu | 13 new features | my profile | sign out
meraki
tnight Home Network | 2259 15th St.
Search dashboard
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Add access points
Organization
Help

Firewall & traffic shaping

SSID: tnight-guest

Firewall

Layer 3 firewall rules

#	Policy	Protocol	Destination	Port	Comment	Actions
	Allow	Any	Local LAN	Any	Wireless clients accessing LAN	
	Allow	Any	Any	Any	Default rule	

Add a layer 3 firewall rule

Layer 7 firewall rules: There are no rules defined for this SSID.
Add a layer 7 firewall rule

Traffic shaping rules

Shape traffic: Don't shape traffic on this SSID

Save Changes or cancel

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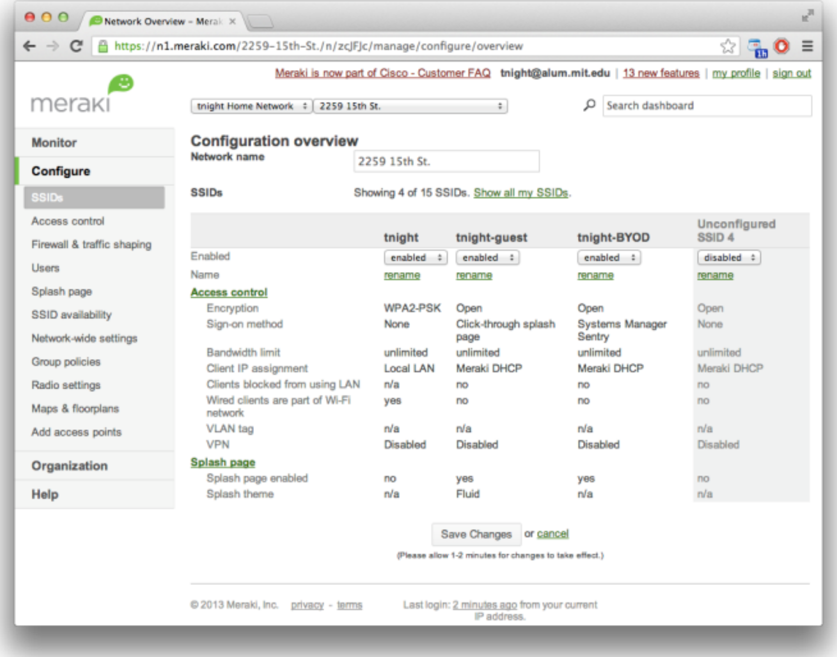
I wish this page would... | make a wish

FTB – Wireless: SSID + Splash Page



Configuration overview

Network name 2259 15th St.

SSIDs Showing 4 of 15 SSIDs. Show all my SSIDs.

	tnight	tnight-guest	tnight-BYOD	Unconfigured SSID 4
Enabled	enabled	enabled	enabled	disabled
Name	rename	rename	rename	rename
Access control				
Encryption	WPA2-PSK	Open	Open	Open
Sign-on method	None	Click-through splash page	Systems Manager Sentry	None
Bandwidth limit	unlimited	unlimited	unlimited	unlimited
Client IP assignment	Local LAN	Meraki DHCP	Meraki DHCP	Meraki DHCP
Clients blocked from using LAN	n/a	no	no	no
Wired clients are part of Wi-Fi network	yes	no	no	no
VLAN tag	n/a	n/a	n/a	n/a
VPN	Disabled	Disabled	Disabled	Disabled
Splash page				
Splash page enabled	no	yes	yes	no
Splash theme	n/a	Fluid	n/a	n/a

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

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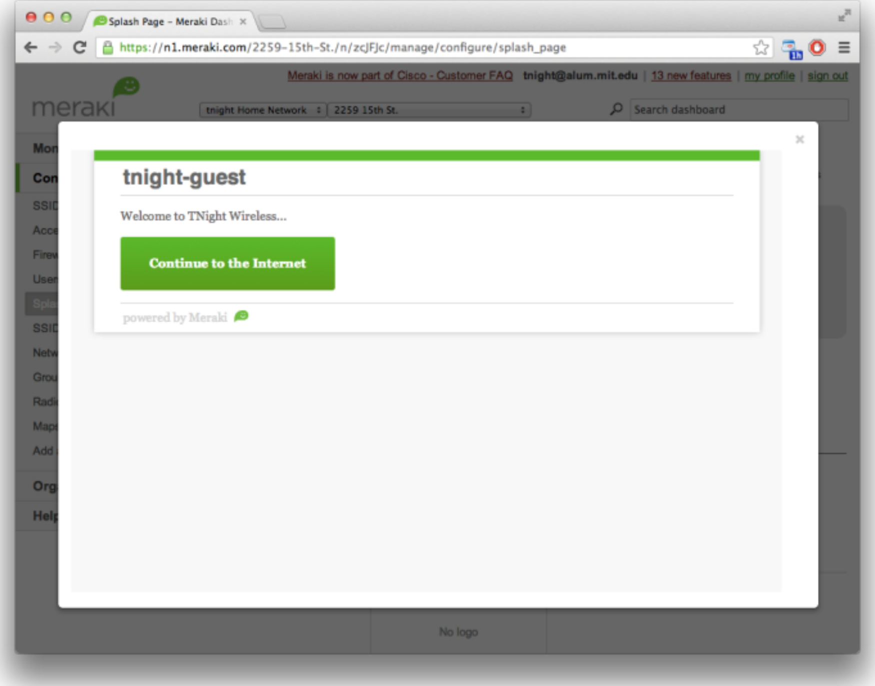
Splash Page – Meraki Dash
https://n1.meraki.com/2259-15th-St./n/zcJFJc/manage/configure/splash_page
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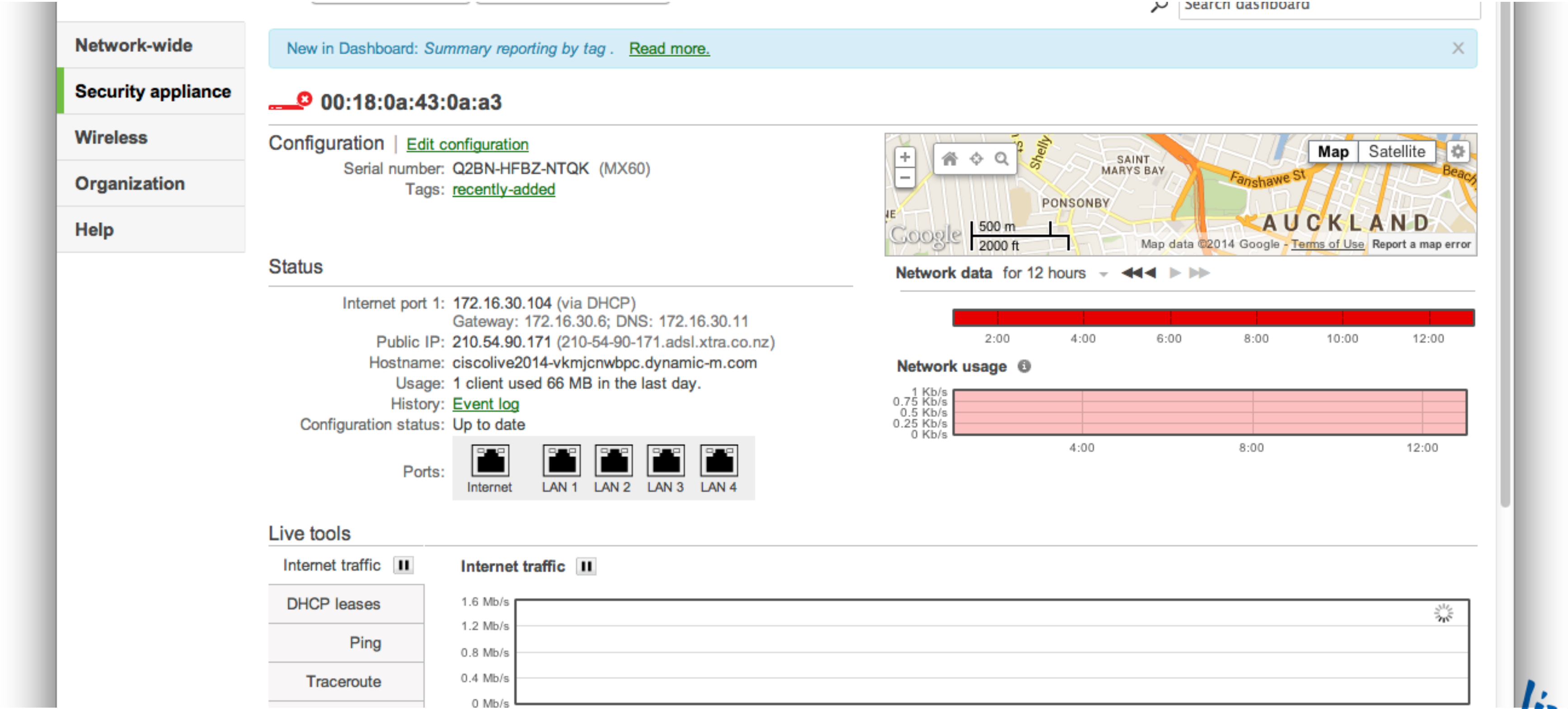
tnight@alum.mit.edu | 13 new features | my profile | sign out
meraki
tnight Home Network
2259 15th St.
Search dashboard
Continue to the Internet
powered by Meraki
No logo

tnight-guest

Welcome to TNight Wireless...

FTB: Power Up Security Appliance



Search dashboard

- Network-wide
- Security appliance
- Wireless
- Organization
- Help

New in Dashboard: *Summary reporting by tag* . Read more. ×

00:18:0a:43:0a:a3

Configuration | Edit configuration

Serial number: Q2BN-HFBZ-NTQK (MX60)
Tags: recently-added

Status

Internet port 1: 172.16.30.104 (via DHCP)
Gateway: 172.16.30.6; DNS: 172.16.30.11
Public IP: 210.54.90.171 (210-54-90-171.adsl.xtra.co.nz)
Hostname: ciscolive2014-vkmjcnwbpc.dynamic-m.com
Usage: 1 client used 66 MB in the last day.
History: Event log
Configuration status: Up to date
Ports: Internet LAN 1 LAN 2 LAN 3 LAN 4

Network data for 12 hours

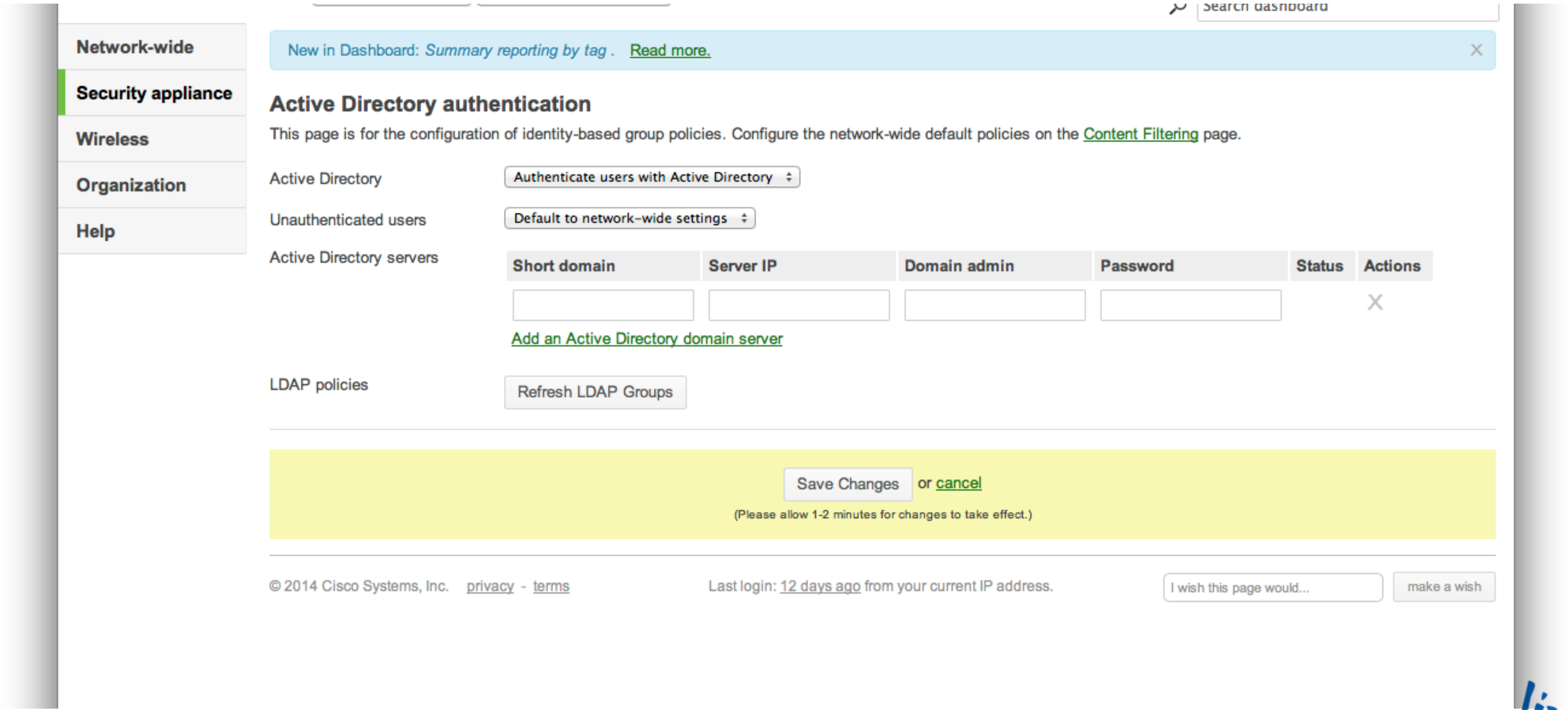
Network usage

Live tools

- Internet traffic
- DHCP leases
- Ping
- Traceroute

Internet traffic

FTB: Connect to AD (So I Can Do BYOD Policy Mgmt)



Active Directory authentication

This page is for the configuration of identity-based group policies. Configure the network-wide default policies on the Content Filtering page.

Active Directory: Authenticate users with Active Directory

Unauthenticated users: Default to network-wide settings

Active Directory servers

Short domain	Server IP	Domain admin	Password	Status	Actions
					X

Add an Active Directory domain server

LDAP policies: Refresh LDAP Groups

Save Changes or cancel

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

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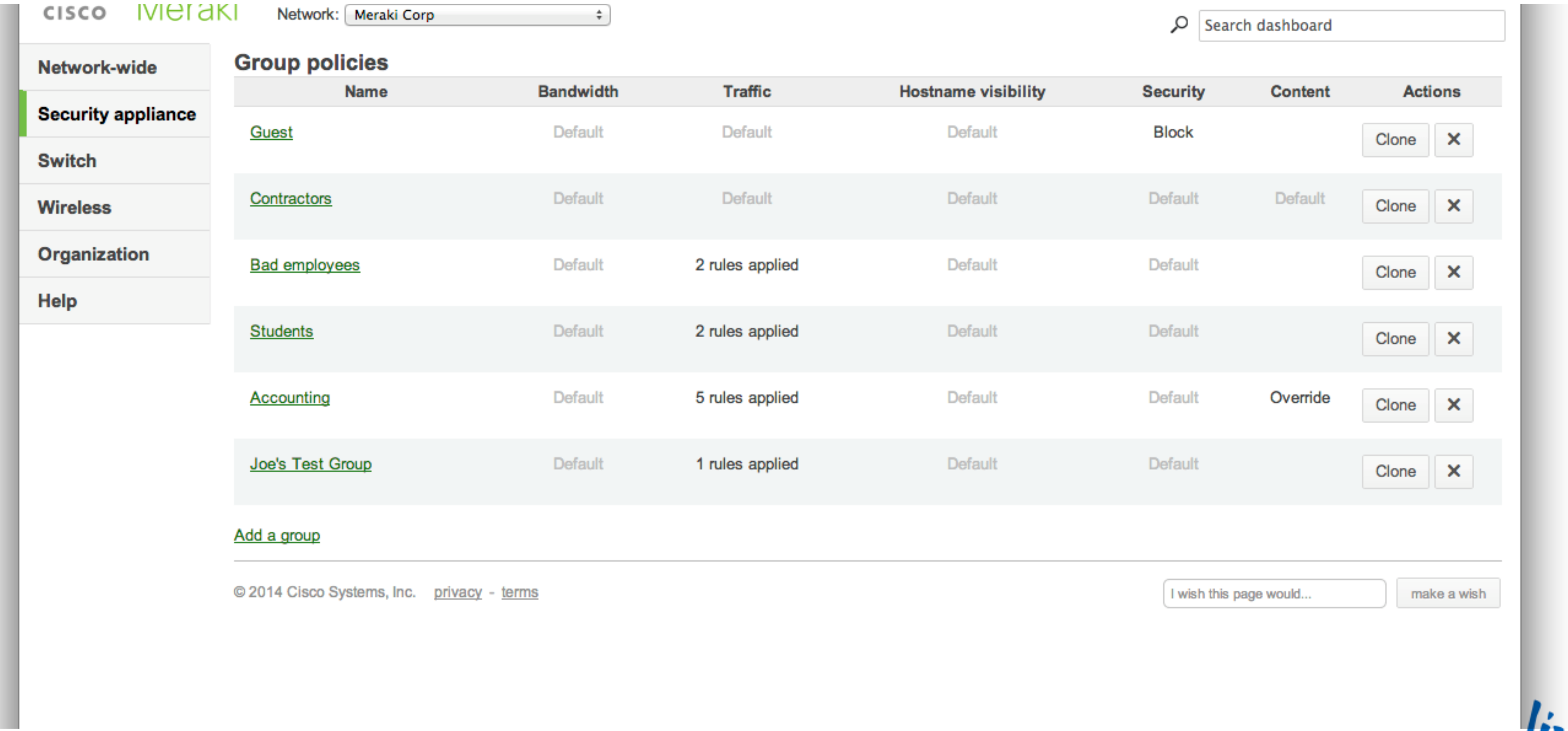
Last login: 12 days ago from your current IP address.

FTB: Create Policies



Group policies

Name	Bandwidth	Traffic	Hostname visibility	Security	Content	Actions
Guest	Default	Default	Default	Block		Clone ✕
Contractors	Default	Default	Default	Default	Default	Clone ✕
Bad employees	Default	2 rules applied	Default	Default		Clone ✕
Students	Default	2 rules applied	Default	Default		Clone ✕
Accounting	Default	5 rules applied	Default	Default	Override	Clone ✕
Joe's Test Group	Default	1 rules applied	Default	Default		Clone ✕

Add a group

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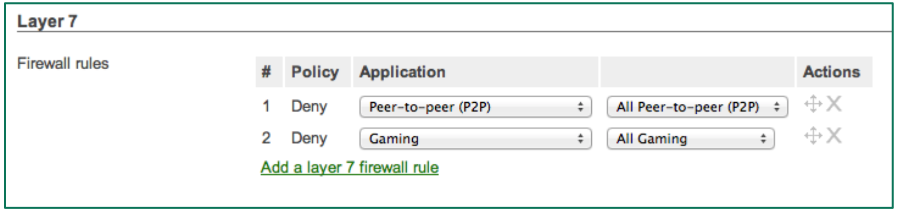
FTB: Set-up Security Policies

- Filtering – Block Peer2Peer
- Traffic Shaping – Rate limit Gaming
- URL Filtering – Block Gambling

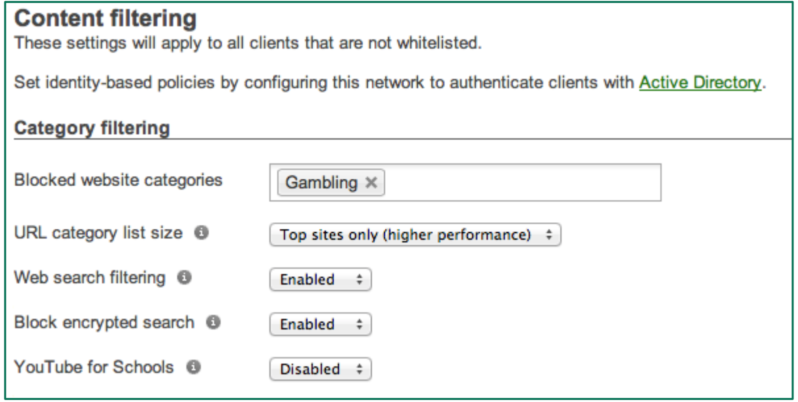


Layer 7

Firewall rules

#	Policy	Application		Actions
1	Deny	Peer-to-peer (P2P)	All Peer-to-peer (P2P)	✥ ✕
2	Deny	Gaming	All Gaming	✥ ✕

Add a layer 7 firewall rule



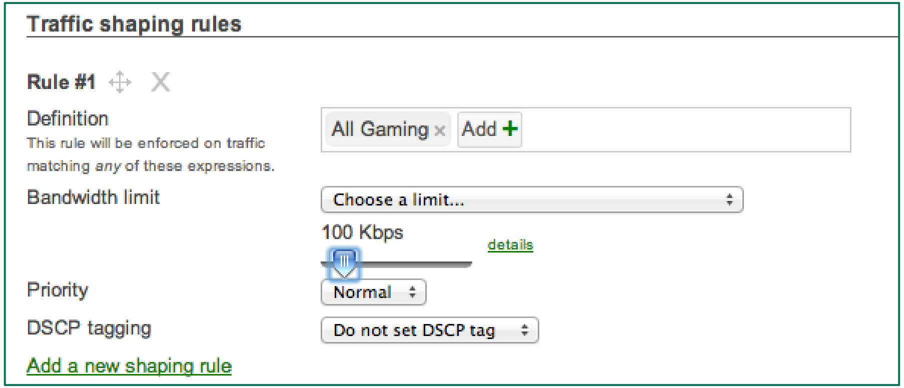
Content filtering

These settings will apply to all clients that are not whitelisted.

Set identity-based policies by configuring this network to authenticate clients with Active Directory.

Category filtering

Blocked website categories	Gambling ✕
URL category list size ℹ	Top sites only (higher performance)
Web search filtering ℹ	Enabled
Block encrypted search ℹ	Enabled
YouTube for Schools ℹ	Disabled



Traffic shaping rules

Rule #1 ✥ ✕

Definition: All Gaming ✕ Add +

This rule will be enforced on traffic matching *any* of these expressions.

Bandwidth limit: Choose a limit...

100 Kbps details

Priority: Normal

DSCP tagging: Do not set DSCP tag

Add a new shaping rule

Here’s A Network That I Prepared Earlier…

Lets have a look at a working network that is in production and has lots of interesting traffic.

- Clients
- Application Usage – e.g. YouTube
- Control user with Policies
- MDM

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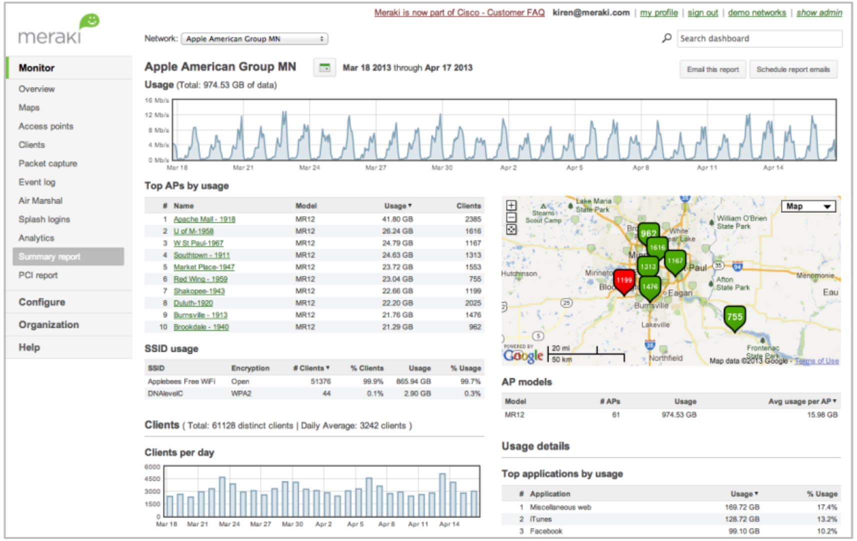
Case Studies

Case Study: Applebee’s



Apple American Group MN Mar 18 2013 through Apr 17 2013

Usage (Total: 974.53 GB of data)

Top APs by usage

#	Name	Model	Usage ▾	Clients
1	Apache Mall - 1918	MR12	41.80 GB	2385
2	U of M-1958	MR12	26.24 GB	1616
3	W St Paul-1967	MR12	24.79 GB	1167
4	Southtown - 1911	MR12	24.63 GB	1313
5	Market Place-1947	MR12	23.72 GB	1553
6	Red Wing - 1959	MR12	23.04 GB	755
7	Shakopee-1943	MR12	22.66 GB	1199
8	Duluth-1920	MR12	22.20 GB	2025
9	Burnsville - 1913	MR12	21.76 GB	1476
10	Brookdale - 1940	MR12	21.29 GB	962

SSID usage

SSID	Encryption	# Clients ▾	% Clients	Usage	% Usage
Applebees Free WiFi	Open	51376	99.9%	865.94 GB	99.7%
DNAlevelC	WPA2	44	0.1%	2.90 GB	0.3%

Clients (Total: 61128 distinct clients | Daily Average: 3242 clients)

Clients per day

AP models

Model	# APs	Usage	Avg usage per AP ▾
MR12	61	974.53 GB	15.98 GB

Usage details

Top applications by usage

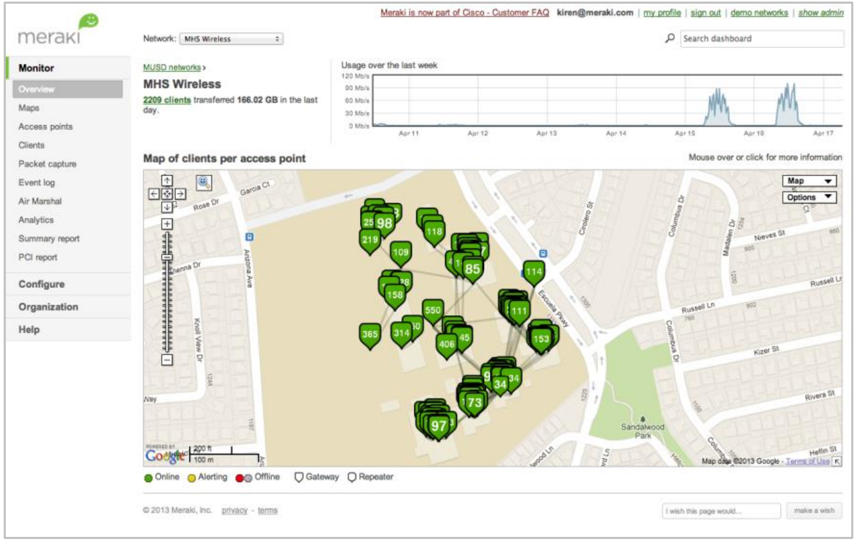
#	Application	Usage ▾	% Usage
1	Miscellaneous web	169.72 GB	17.4%
2	iTunes	128.72 GB	13.2%
3	Facebook	99.10 GB	10.2%

- Wireless LAN spanning over 270 restaurants nationwide
- Customer engagement through guest access, coupons, promotions
- PCI-compliant solution enables mobile POS
- Restaurants centrally managed over the web
- Deployed without pre-staging or on-site IT

“The Meraki Dashboard makes it easy to manage the WiFi across all the restaurants, and we have the visibility we wanted.”

Leslie McMasters, Network Administrator, Apple American Group

Case Study: Milpitas Unified School District



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meraki

Network: MHS Wireless

Search dashboard

- Monitor
  - Overview
  - Maps
  - Access points
  - Clients
  - Packet capture
  - Event log
  - Air Marshal
  - Analytics
  - Summary report
  - PCI report
- Configure
- Organization
- Help

MUSD networks ›

MHS Wireless

2209 clients transferred **166.02 GB** in the last day.

Usage over the last week

Map of clients per access point

Mouse over or click for more information

● Online ● Alerting ●● Offline ▢ Gateway ▢ Repeater

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I wish this page would... make a wish

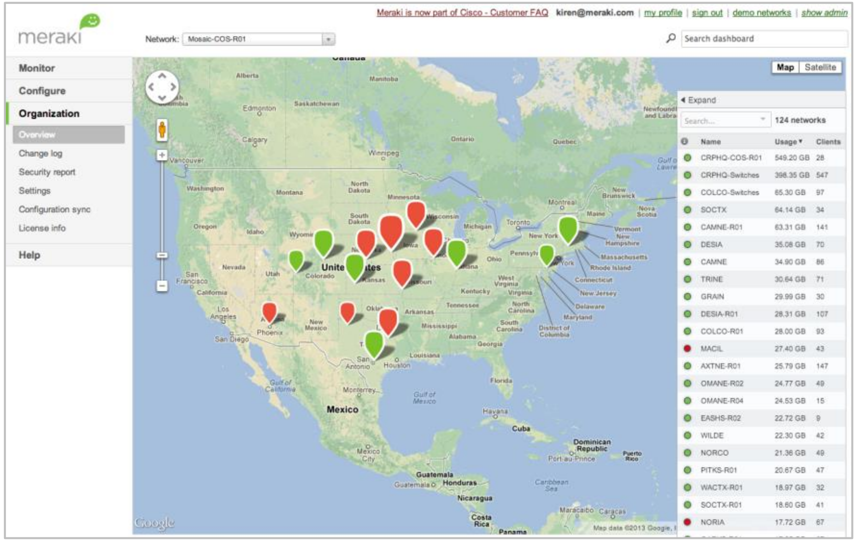
valued · challenged · successful

- California school district with 14 schools, 10,000 students
- Deployed cloud-managed firewall, 500 wireless APs (indoor + outdoor), and 100 Ethernet switches
- Enabled 1:1 Google Chromebook deployment and BYOD policy
- Application visibility and control optimises bandwidth across 10k+ clients

> *"The Dashboard, the traffic shaping, and the MDM were real advantages. We can see the traffic and devices on the fly."*

Chin Song, Director of Technology, Milpitas Unified School District

Case Study: Mosaic



124 networks

	Name	Usage ▾	Clients
●	CRPHQ-COS-R01	549.20 GB	28
●	CRPHQ-Switches	398.35 GB	547
●	COLCO-Switches	65.30 GB	97
●	SOCTX	64.14 GB	34
●	CAMNE-R01	63.31 GB	141
●	DESIA	35.08 GB	70
●	CAMNE	34.90 GB	86
●	TRINE	30.64 GB	71
●	GRAIN	29.99 GB	30
●	DESIA-R01	28.31 GB	107
●	COLCO-R01	28.00 GB	93
●	MACIL	27.40 GB	43
●	AXTNE-R01	25.79 GB	147
●	OMANE-R02	24.77 GB	49
●	OMANE-R04	24.53 GB	15
●	EASHS-R02	22.72 GB	9
●	WILDE	22.30 GB	42
●	NORCO	21.36 GB	49
●	PITKS-R01	20.67 GB	47
●	WACTX-R01	18.97 GB	32
●	SOCTX-R01	18.60 GB	41
●	NORIA	17.72 GB	67

MOSAIC℠

- Healthcare and services provider with 5,000 employees, 40 facilities across 11 states
- Deployed 350 cloud-managed wireless APs, switches, and security appliances
- HIPAA-compliant WiFi for electronic medical records and guest access
- Centrally managed by small IT staff

“The Meraki solution has provided us with a secure, centrally managed distributed network.”

Daniel McDonald, Systems Integration Manager, Mosaic cisco™