



CISCO
Connect

Dubai, UAE
February 18-19, 2015

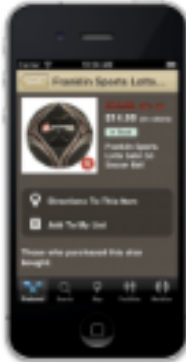
*TOMORROW
starts here.*

Delivering Location Based Services with Cisco Enterprise Mobility Services Platform

Christian Gauer, TME Enterprise Solutions Group

Create Business Impact with Cisco's CMX

Detect



- Presence and location detection
- Visibility

Connect



- Easy Wi-Fi login, custom or social
- Zone-based, custom splash pages

Engage

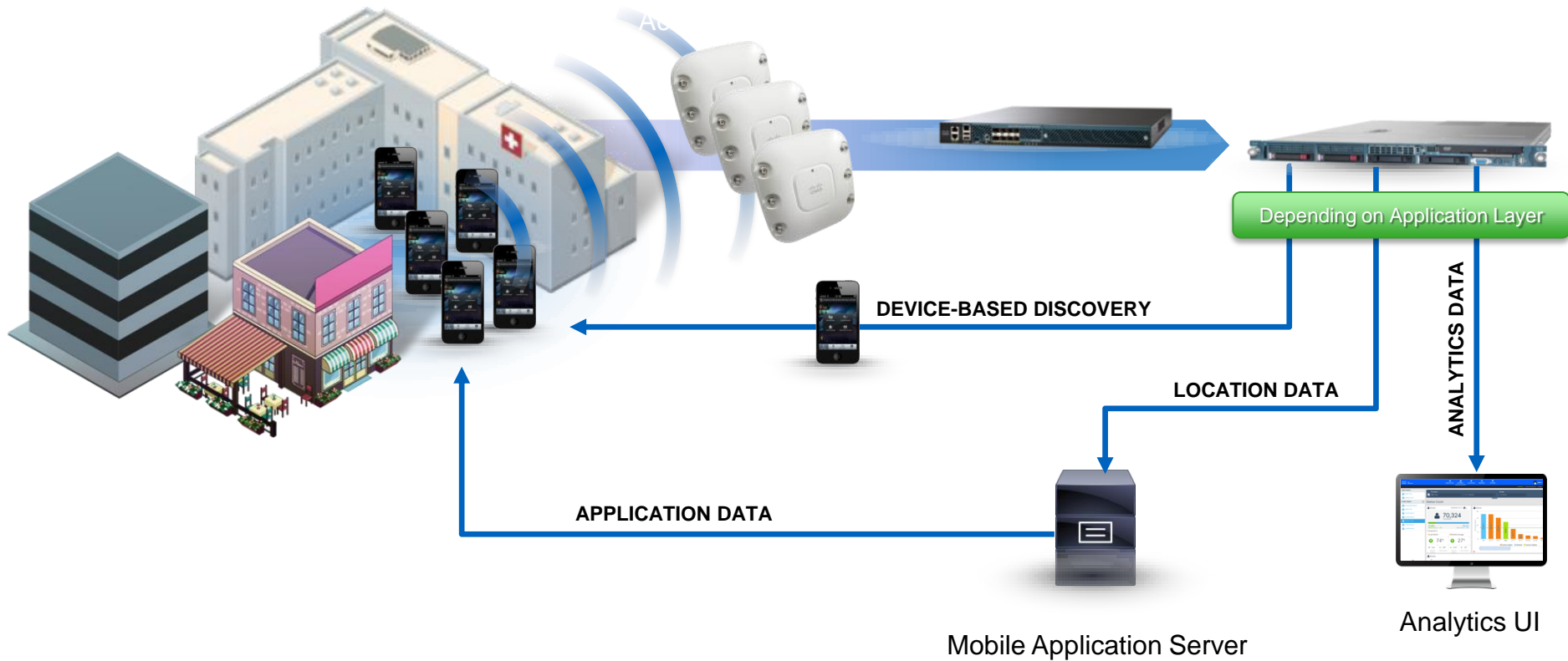


- App-based mobile engagement
- Context-aware in-venue experiences

Analytics

How CMX Works

Built on Cisco Unified Access

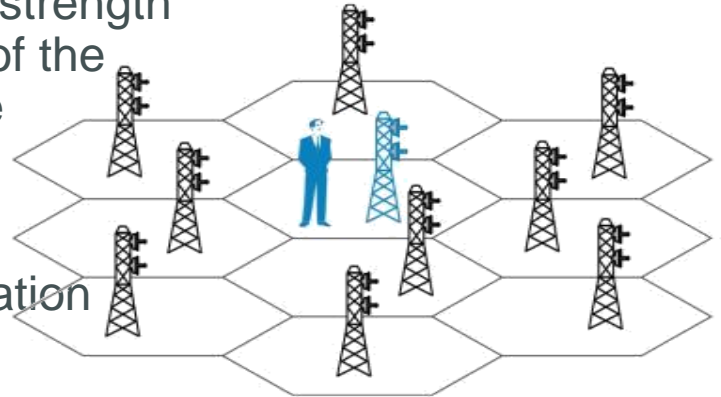


Indoor Positioning



Cell of Origin

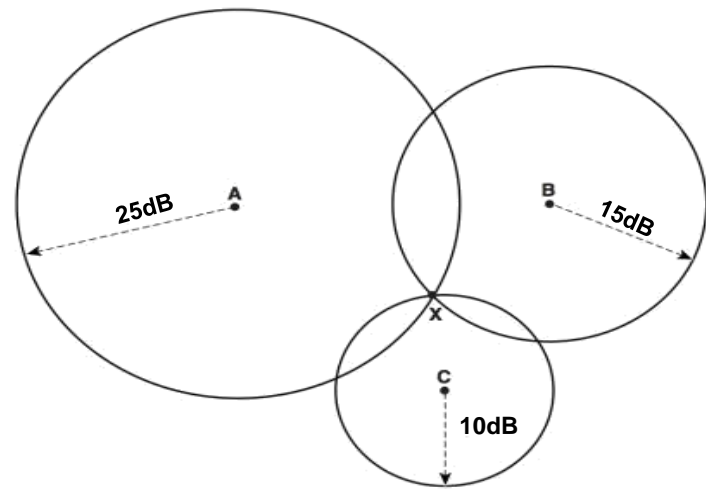
- One of the simplest mechanisms of estimating approximate location in any system based on RF cells is the concept of ‘cell of origin’ (or ‘associated access point’ in Wi-Fi 802.11 systems)
- To better determine which areas of the cell possess the highest probability of containing the mobile device, some additional method of resolving location within the cell is usually required.
- When receiving cells, provide received signal strength indication (RSSI) for mobile devices; the use of the highest signal strength technique can improve location granularity over the cell of origin.
- With CMX this level of positioning granularity would only suffice to provide presence information



Distance-Based (Lateration) Techniques

Received Signal Strength (RSS)

- Lateration can be performed by using RSS in place of time (TDOA)
 - Measured by either the mobile device or the receiving sensor
- Path loss represents the level of signal attenuation present in the environment due to the effects of free space propagation, reflection, diffraction, and scattering
 - Path loss exponent indicates the rate at which the path loss increases with distance; the value depends on frequency and environment
 - Is highly dependent on the degree of obstruction (or clutter) present in the environment



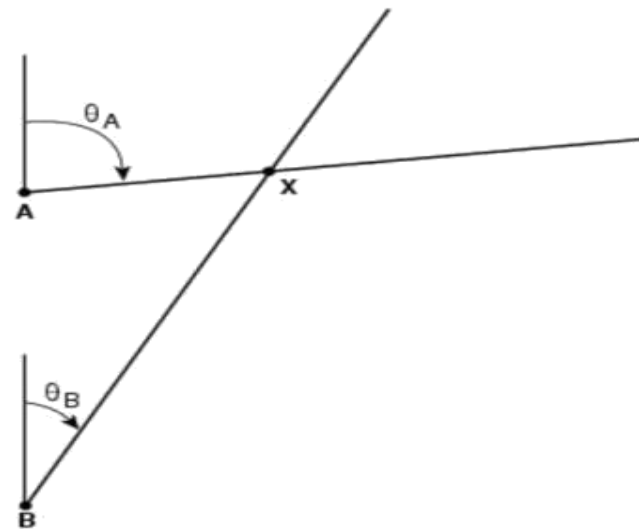
Typical path loss exponent for:

- Indoor office environment - 3.5
- Dense commercial or industrial environment - 3.7 to 4.0
- Dense home environment - as high as 4.5

Angle-Based (Angulation) Techniques

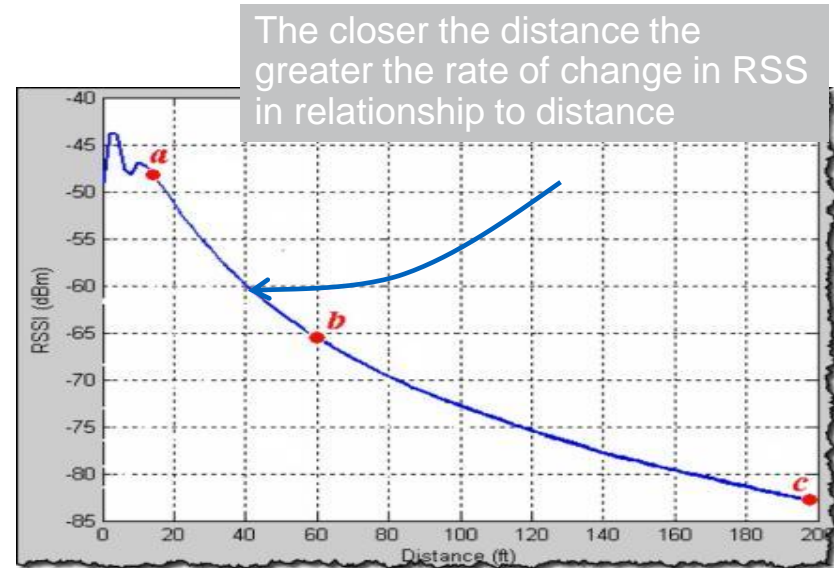
Angle of Arrival (AoA)

- The AoA locates the mobile station by determining the angle of incidence at which signals arrive at the receiving sensor
- Requires two receiving sensors for location estimation, with improved accuracy coming from at least three or more receiving sensors (triangulation)
- Requires multiple element antenna arrays or mechanically-agile directional antennas
- Works well in situations with direct line of sight, but suffers from decreased accuracy and precision when confronted with signal reflections from surrounding objects
- In dense urban areas, AoA becomes barely usable because line of sight to two or more base stations is seldom present



Relationship Between RSSI & Distance

- RF fingerprinting uses a client's RSS from probe requests to localize a tracked client
- This localization works best when the relationship between the RSS and the distance from the AP poses a clearly monotonic relationship
- Monotonic means Y only moves up or down in relation to X

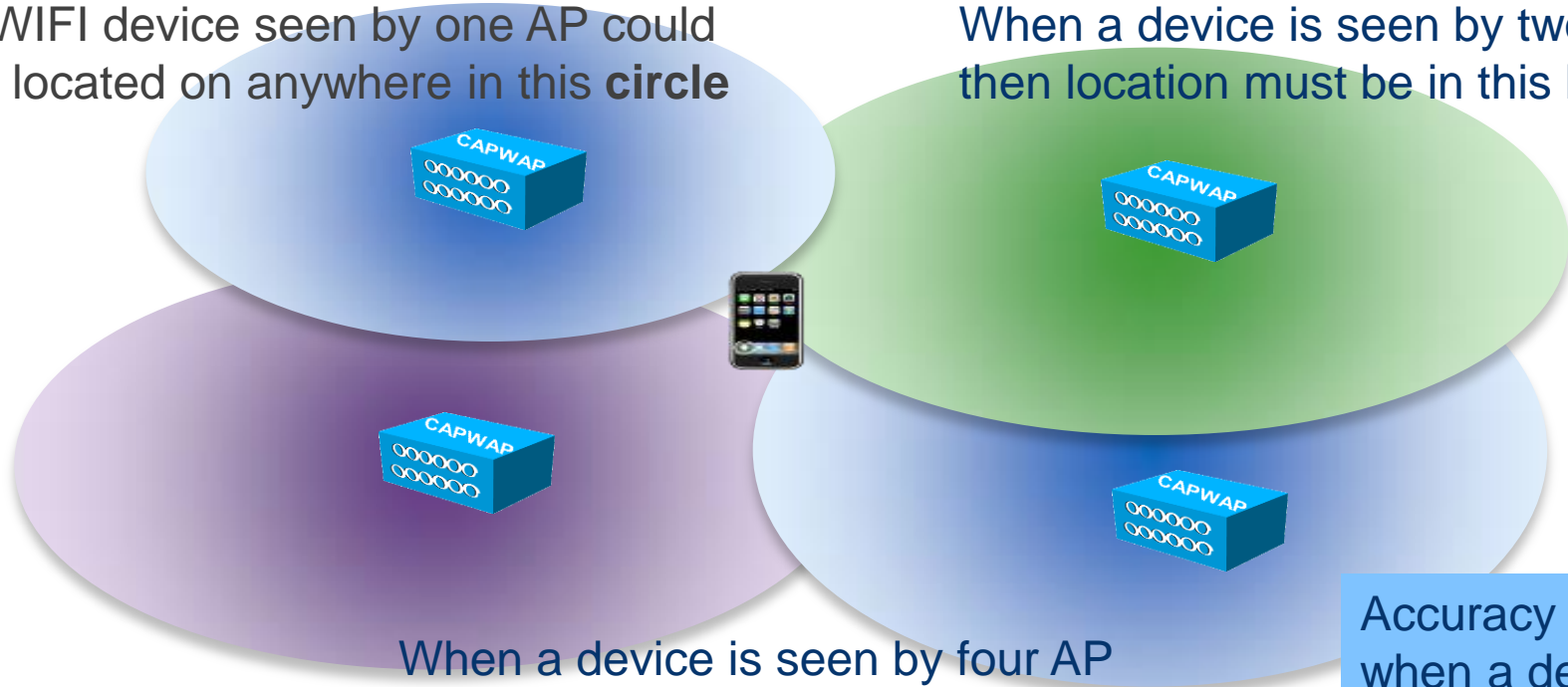


The change in RSS in relationship to distance flattens out at greater distances

WiFi Based Location Calculation Basics (Trilateration)

A WIFI device seen by one AP could be located on anywhere in this **circle**

When a device is seen by two AP then location must be in this **line**



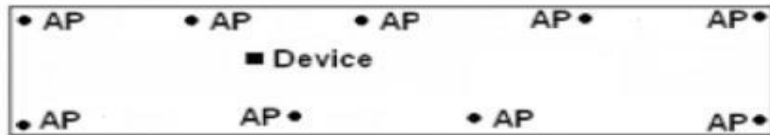
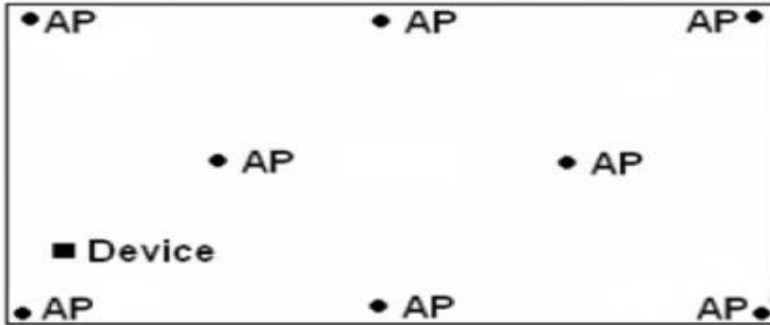
When a device is seen by four AP then location must be at this **point**.

Accuracy highest when a device is seen by at least 4 Access points

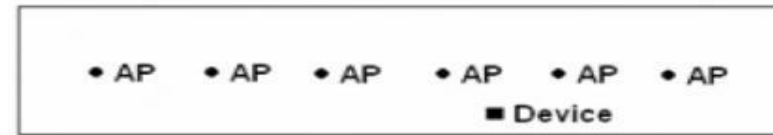
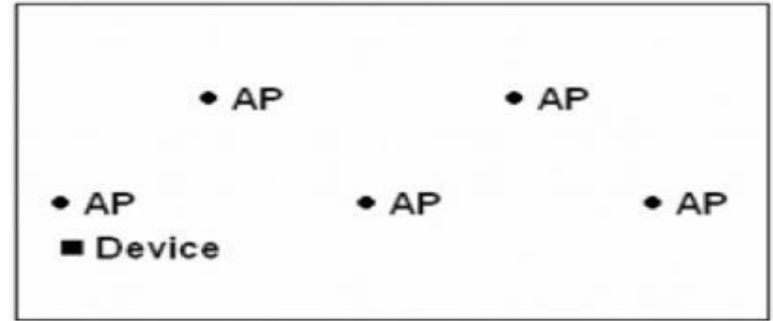
Basic Example of Location-Aware Access Point Deployment

If possible, mount antennas such that they have an unencumbered 360° view of all areas around them, without being blocked at close range by large objects.

Recommended



Not Recommended



Presence and Location Comparison

- Device is in/out of the store
- Based on distance to an access point



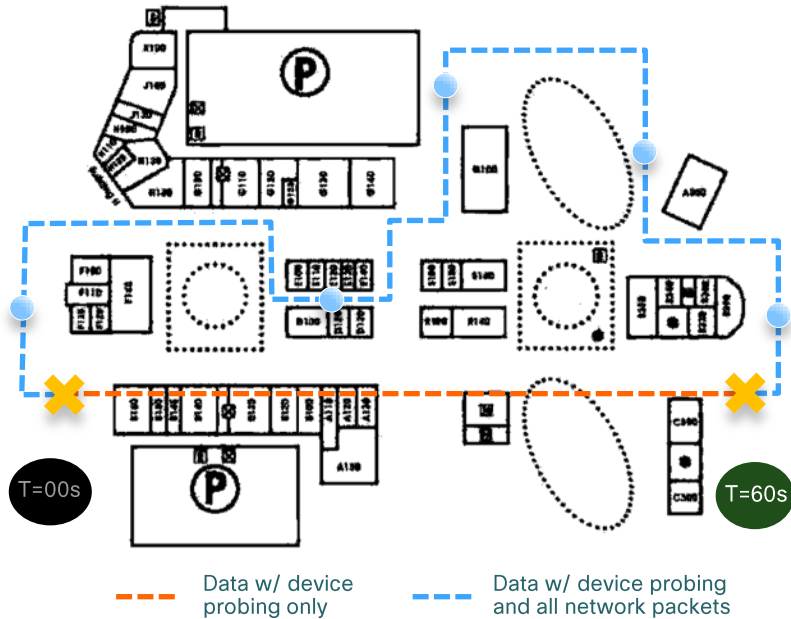
- Device is in a department of the store
- Based on X, Y coordinates



Probe RSSI vs. Data RSSI

Location Resolution is Critical to Actionable Business Intelligence

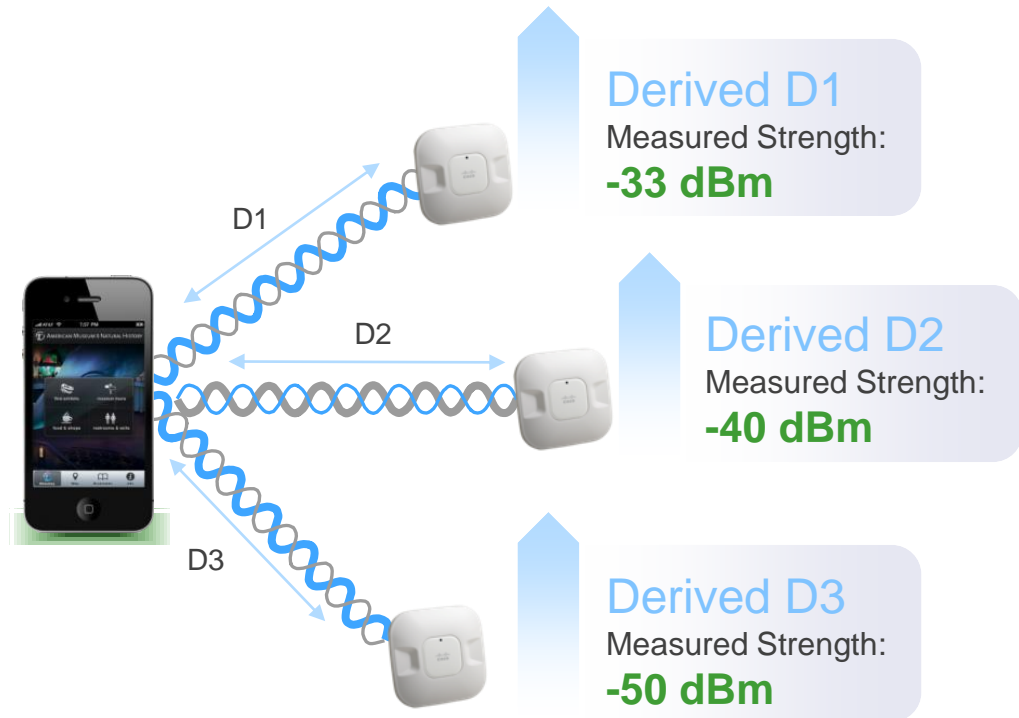
Business Intelligence is Critical to Proper Decision Making...



...And It Needs To Scale

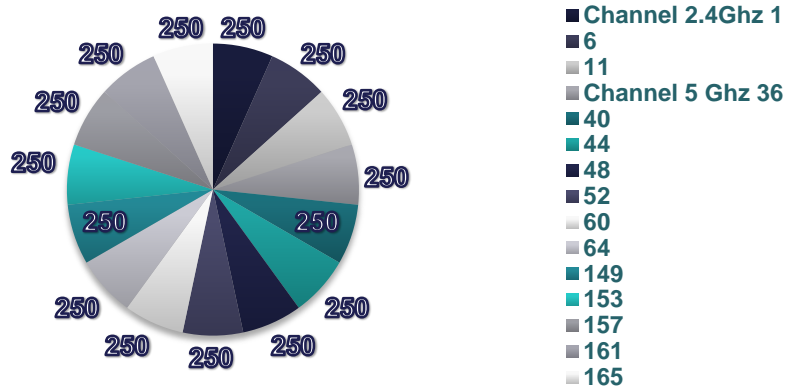
How Location Is Calculated with FastLocate

- Access points detect mobile devices or tag signals and measure RSSI from all frames sent over Wi-Fi.
- Controllers send RSSI information signal to the Cisco MSE for location calculation.
- RF fingerprinting and triangulation, based on signal strengths, are used to calculate device location.
- Out of Data Path for Higher Scalability



WSM Module Listening for ¼ Sec. on Each Channel

Scan Time on Channels (ms)



- When a client is constantly sending packets on a channel, network will get a packet EVERY 4 seconds (250ms x 16 channels) and be able to gather values once every 4 seconds.
- Location is calculated approximately 1 every 8 seconds. (~8 times per Minute)

What is Bluetooth Low Energy (BLE)?

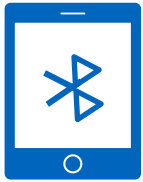
- Bluetooth Low Energy (BLE) is a subset of the Bluetooth 4.0 spec
 - Ultra-low power consumption – run for years on a coin battery
 - Low-cost system-on-chip solutions – proliferate in small devices
 - Simplified communication protocol – easy to implement & extend
- Operates on the 2.4GHz ISM band (2400-2483.5MHz)
 - 40 channels in-between & overlapping WiFi Ch 1,6,11
 - 1 Mbps GFSK, frequency-hopping
 - Reliable signaling up to 100m
- Devices identify themselves with UUIDs
 - Like a MAC address, but also encodes a “profile”
 - Sensors, health monitors, alarms, etc.

What is BLE being used for?

- Battery operated BLE Beacon and App for management (sometimes crowd sourced)
- Retailers are using this to quickly test drive location based services
- Healthcare facilities are using this to improve patient experience.
- Museums are using this for personalizing tour experience
- Use cases:
 - Target marketing messages and Ads
 - Display patient location and map of the hospital for navigation
 - Gather Analytics

Cisco's BLE Strategy

BLE Aware



- Use CleanAir to detect BLE
- Check Beacon Health
- Track Assets with BLE
- Alert on rogue beacons

**MSE 10.x and WLC 8.0MR1
Q1CY15**

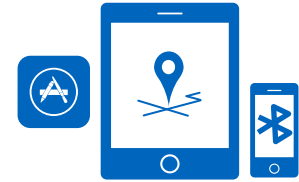
BLE Capable



- Integrated BLE radio with Hyperlocation module
- Reduce number of beacons
- Transmit multiple UUIDs

**MSE 10.x and WLC 8.1
Q2CY15**

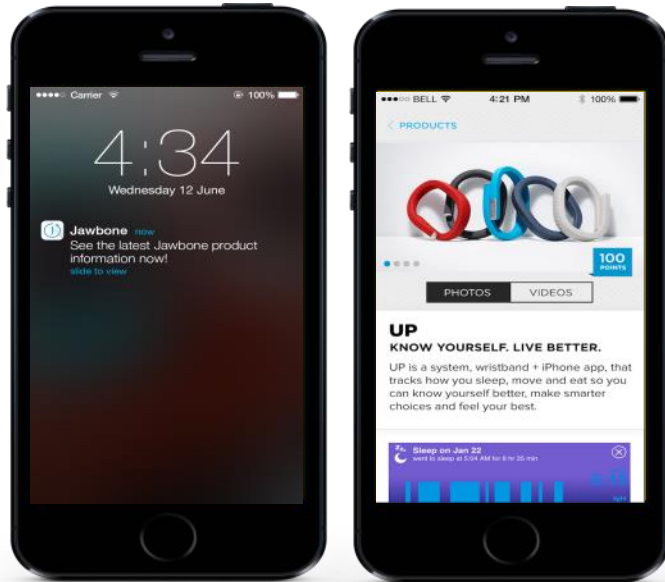
BLE Gateway



- Combined WiFi + BLE Location and Analytics
- Extend CMX SDK to BLE

**MSE10.x and WLC 8.x
Q3CY15**

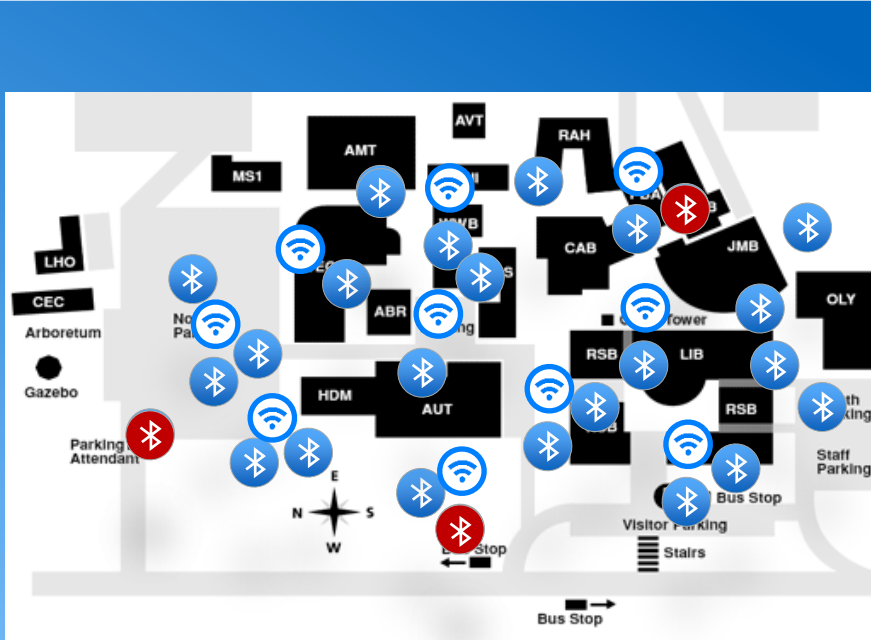
Where does BLE fit in Location strategy



BLE can be part of your location strategy if you already have or will have an App

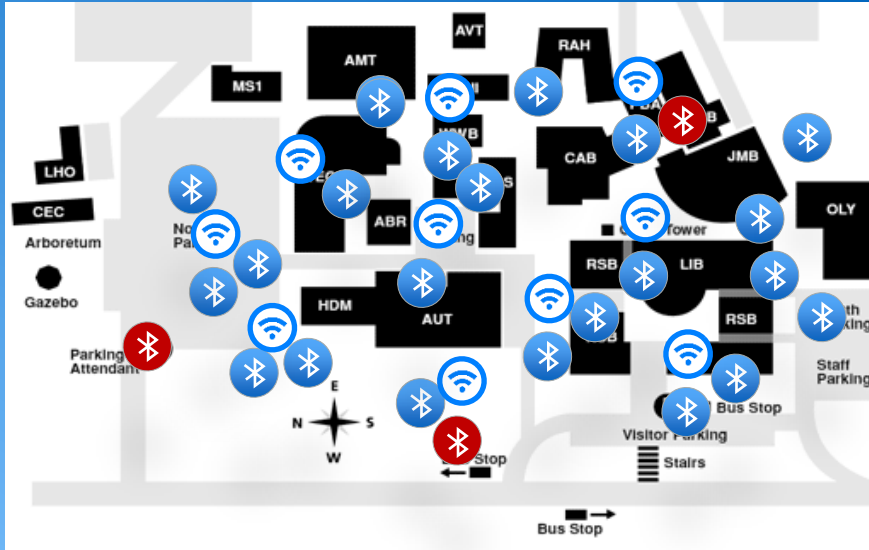
- Opportunities for BLE only
 - Proximity-based messaging
 - Easy to deploy
 - Lower CapEx
- Challenges for BLE only
 - Requires App to be downloaded and running
 - Limited Use Cases if deployed without Wi-Fi
 - Higher OpEx

Beacon and Wi-Fi Location Deployment



- AP's for Wi-Fi
- Beacons for Location
- Beacon rogues difficult to detect

Beacon and Wi-Fi Location Deployment



- Hyperlocation - BLE integrated with APs
- Fewer beacons to deploy/track
- Rouges can be detected and removed

BLE Monitoring – Visibility and Alerts

The screenshot displays the Cisco Connect BLE monitoring interface. The top navigation bar includes 'ANALYTICS', 'LOCATION', 'MANAGE', and 'SYSTEM'. The left sidebar shows a hierarchy: 'Nortech-GG' > 'Nortech-1' > '1st Floor' > 'Unassigned'. The main area shows a floor plan with various rooms labeled, including '147 FACILITIES SHOP', '148 TELEPHONE DATA ROOM', '149 LAB', '150 LAB', '151', '152 MEET', '153 (WORK)', '154', '155', '156', '157', '158', '159', '160 CONFERENCE', '161', '162', '163', '164', '165', '166', '167', '168', '169', '170', '171', '172', '173', '174', '175', '176', '177', '178', '179', '180', '181', '182'. A purple shaded area on the right side of the floor plan is labeled 'Demo Room-CoverageArea-1398643371565'. Within this area, several beacons are marked with yellow and red icons. Labels for these beacons include 'CMXRetail', 'CMX Clinic', 'CMX Office Area', 'CMX Bar', and 'CMX Bank'. A 'Map' button is visible in the top right corner of the floor plan area.

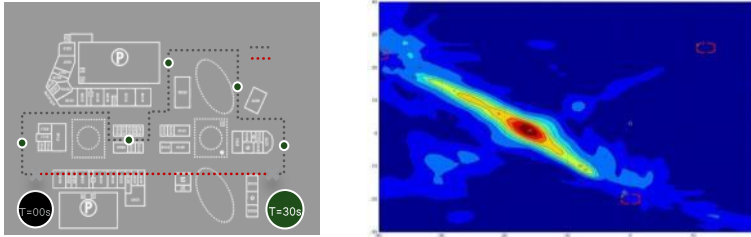
Beacon

- MAC Address:** 00:07:80:04:1f:33
- UUID:** 6e:42:f6:8a:d0:d1:46:7b:a2:3e:9d:11:fa:74:6e:43
- Type:** Rogue
- Status:** Active
- Major:** 73e6
- Minor:** 10
- Calibrated RSSI:** -58
- Manufacturer Id:** 4c00
- Last Updated Time:** Dec 09 2014, 07:27 AM

Annotations:

- BLE mac address
- Unique beacon identifier decoded
- Beacon type classified as an active rogue
- Major ID typically identifies store or branch while minor ID typically identifies aisle or dept. within

Introducing the Cisco Hyperlocation Module



Angle of Arrival (AoA) Triangulation
1-3 m accuracy, <1m with beacons



Integrated BLE Beacon
Reduce BLE deployment size



Centralized Management
BLE and Wi-Fi visibility



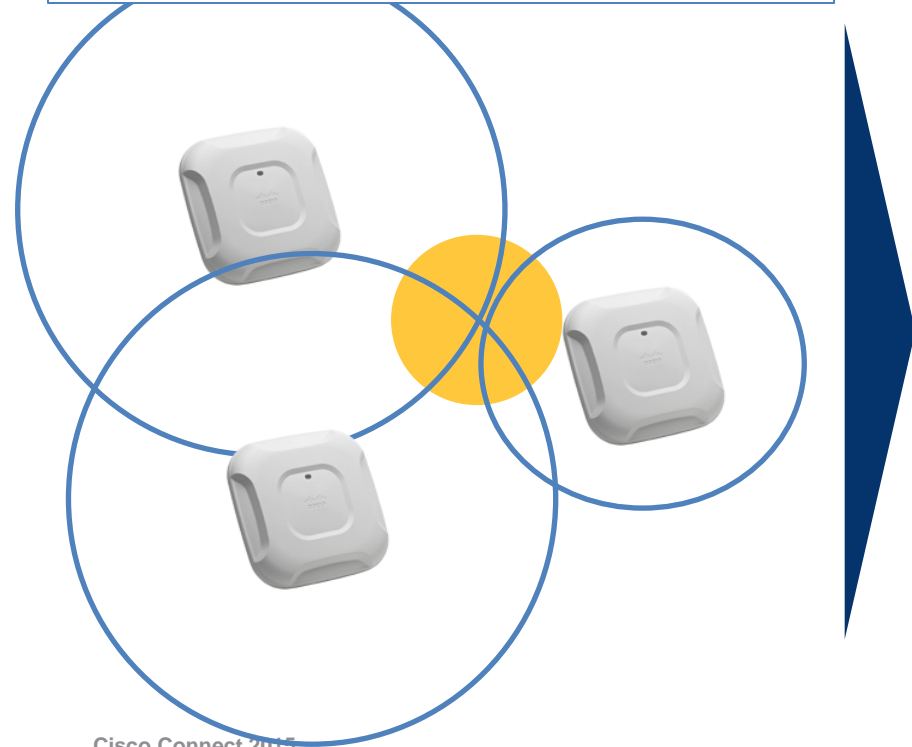
Enhanced FastLocate
Faster refresh rates



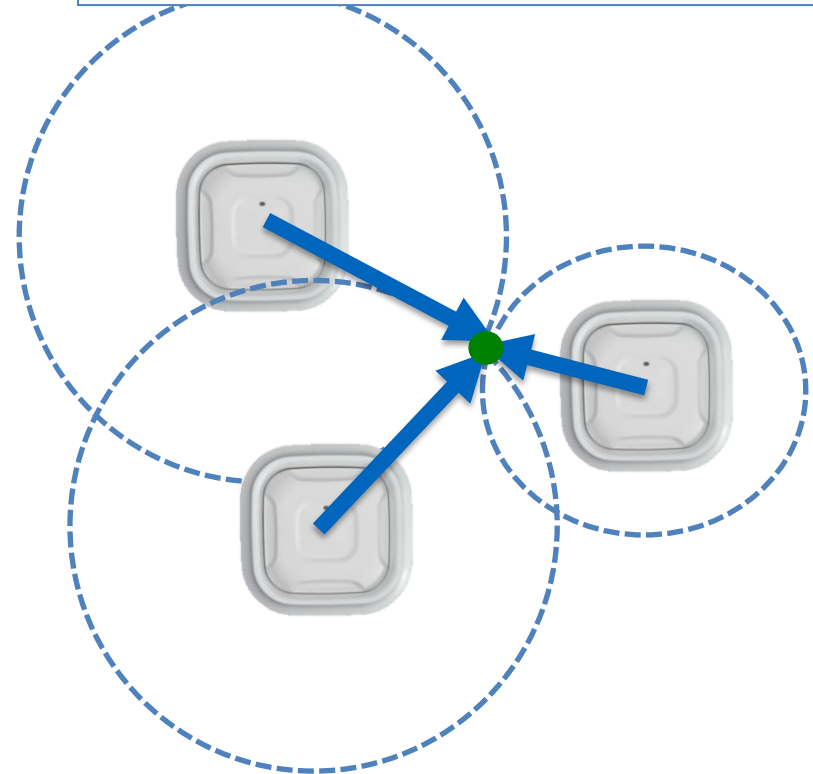
Improved Security Coverage
Integrated Wireless Security Module

Location Accuracy

Today: Approx. distance via RSSI, but no idea which direction → more error in calculation

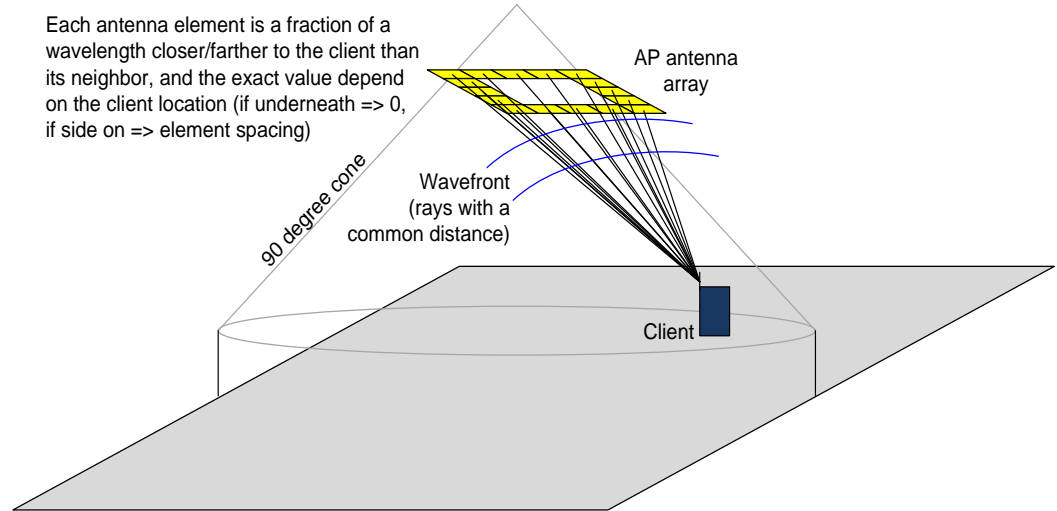


Solution: Determine direction to client in addition to distance → dramatic error reduction



Innovation: Angle of Arrival(AOA) = ~meter accuracy

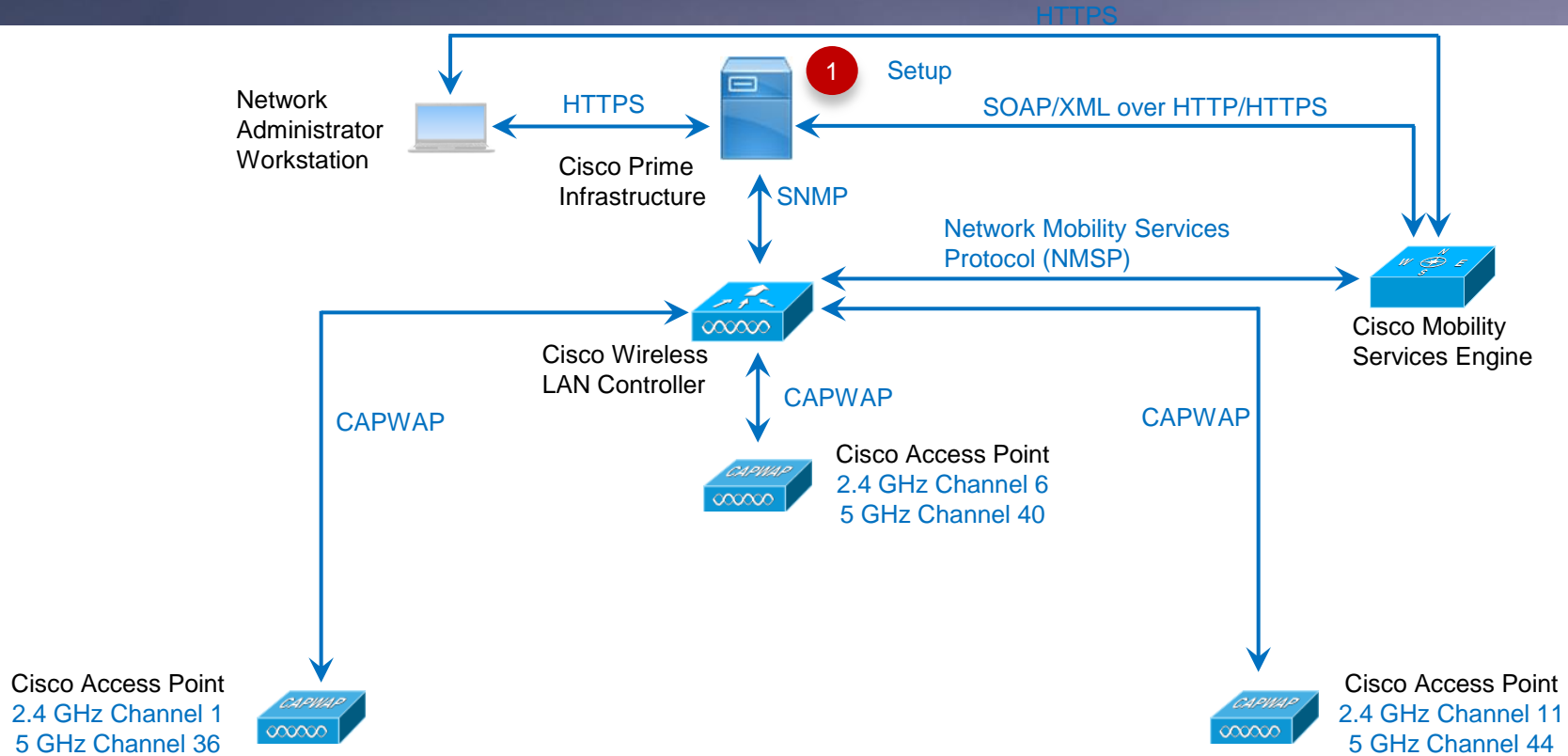
- Different antenna elements hear the signal a little earlier/later than others, measured by the phase of the signal
- Favors line-of-sight with stellar accuracy in cone under AP



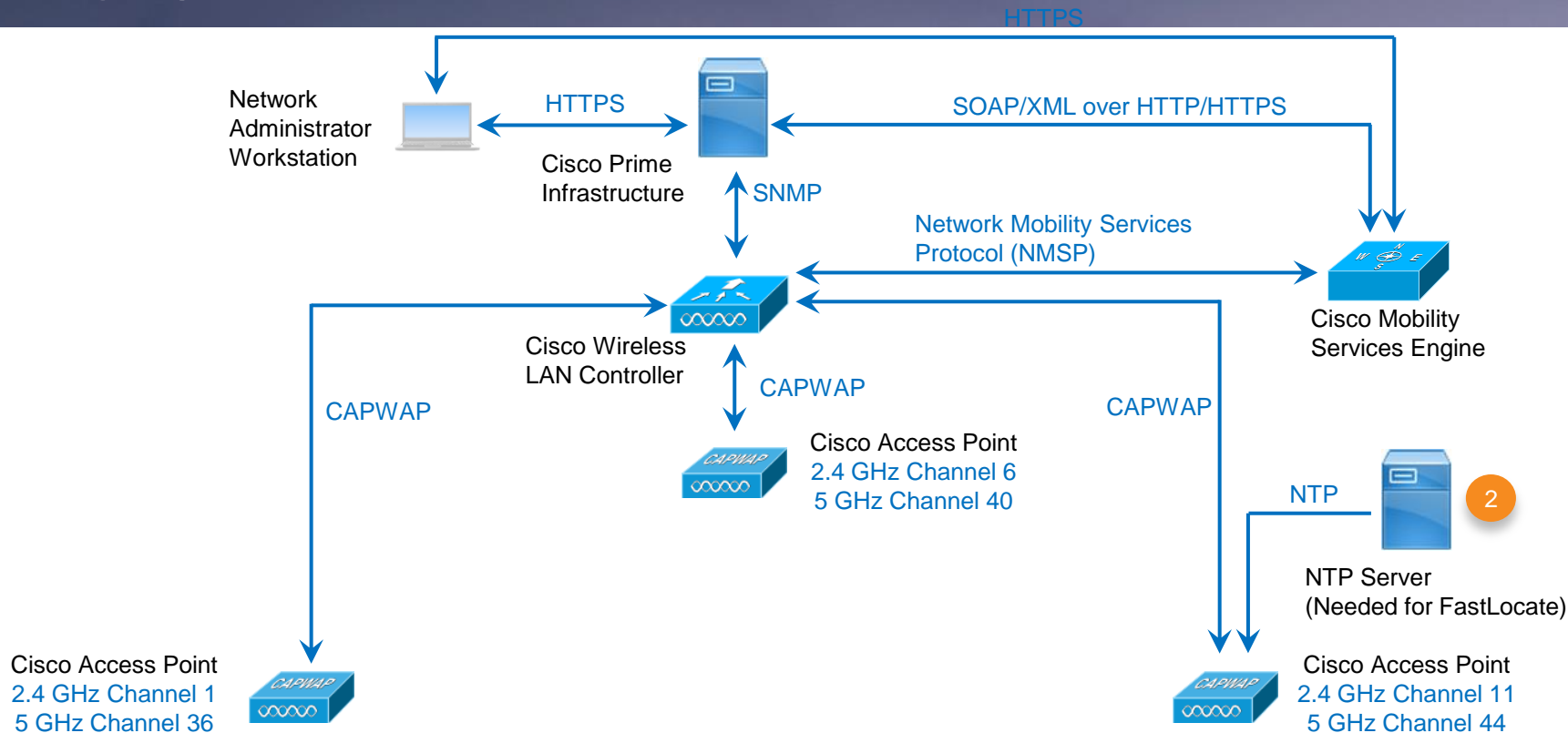
Context Aware Services Architecture



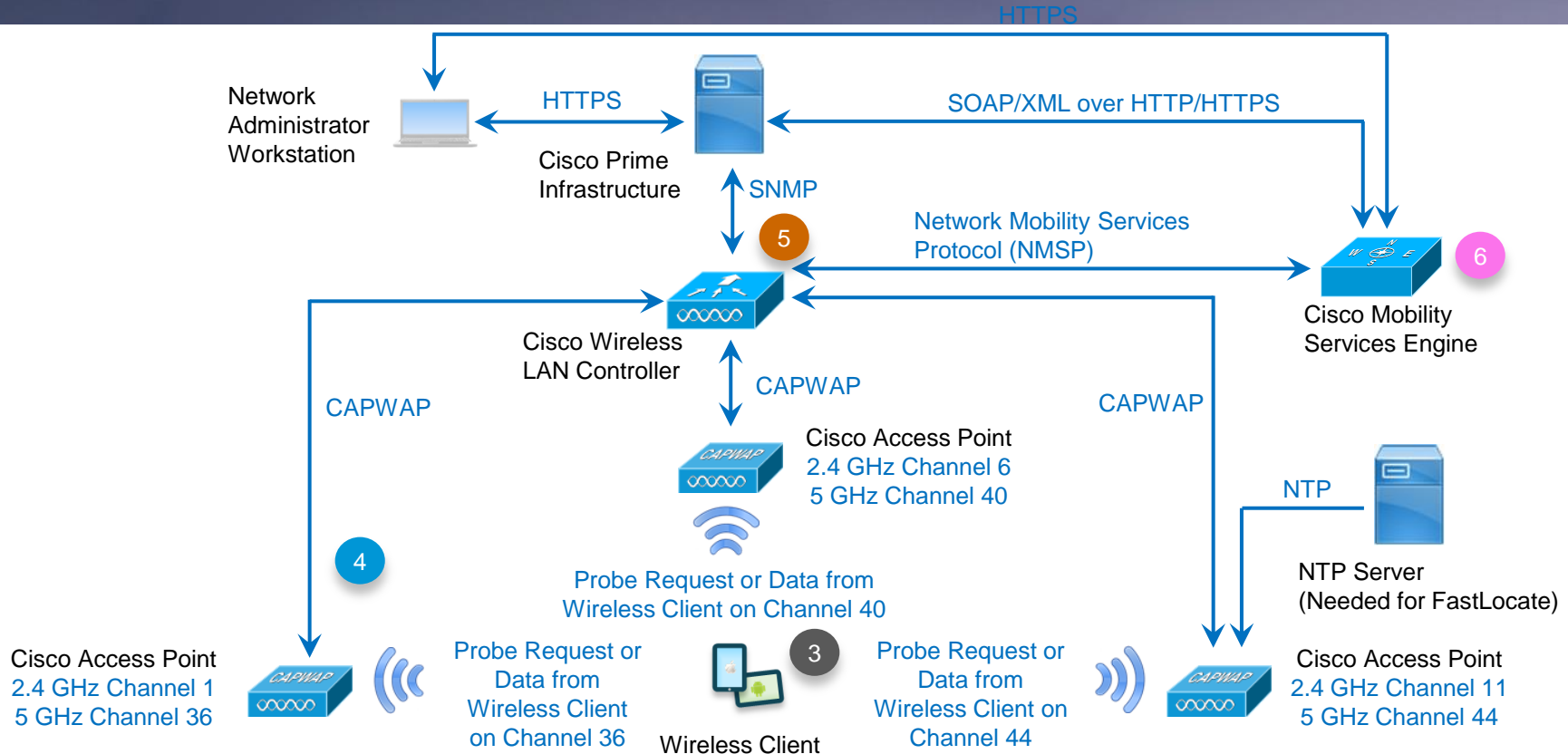
Context Aware Service (CAS) Hardware and Data Flows



Context Aware Service (CAS) Hardware and Data Flows



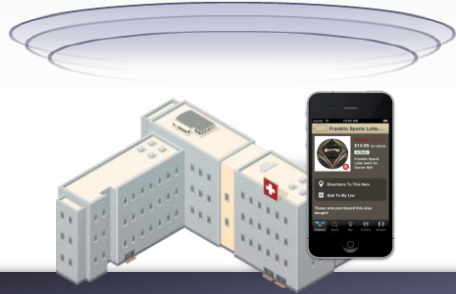
Context Aware Service (CAS) Hardware and Data Flows



Detect – CMX Analytics



Create Connected Experiences with Cisco's CMX



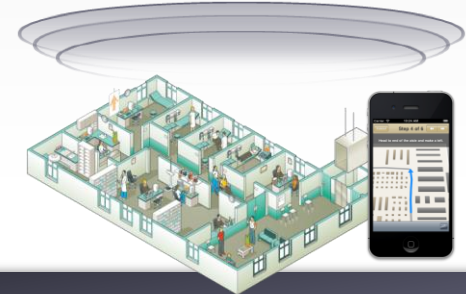
Presence & Analytics

- Presence detection
- On-premise visibility



Visitor Connect

- Easy Wi-Fi login, custom or social
- Zone-based, custom splash pages

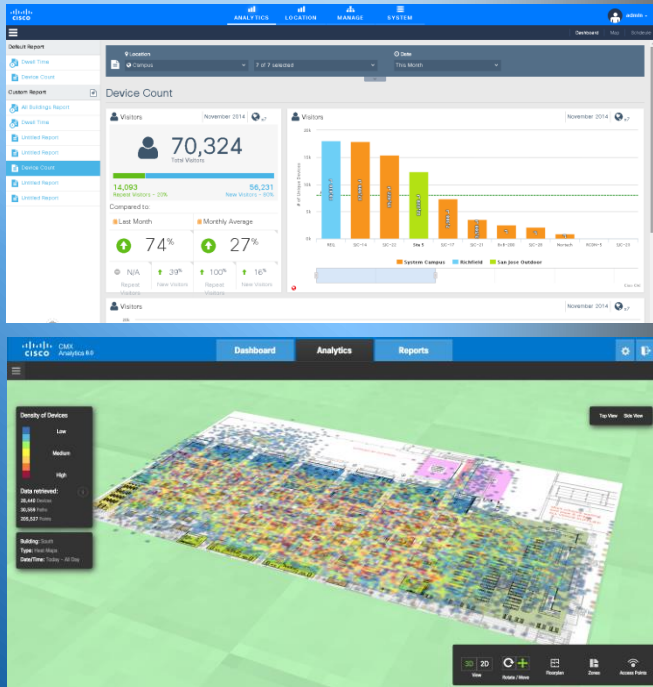


Contextual Experience

- Location-based push notifications
- App-based mobile engagement

Analytics

Understand How People Interact in the Location



Number people by venue and zones



Peak time in venue



New compared to repeat visitors

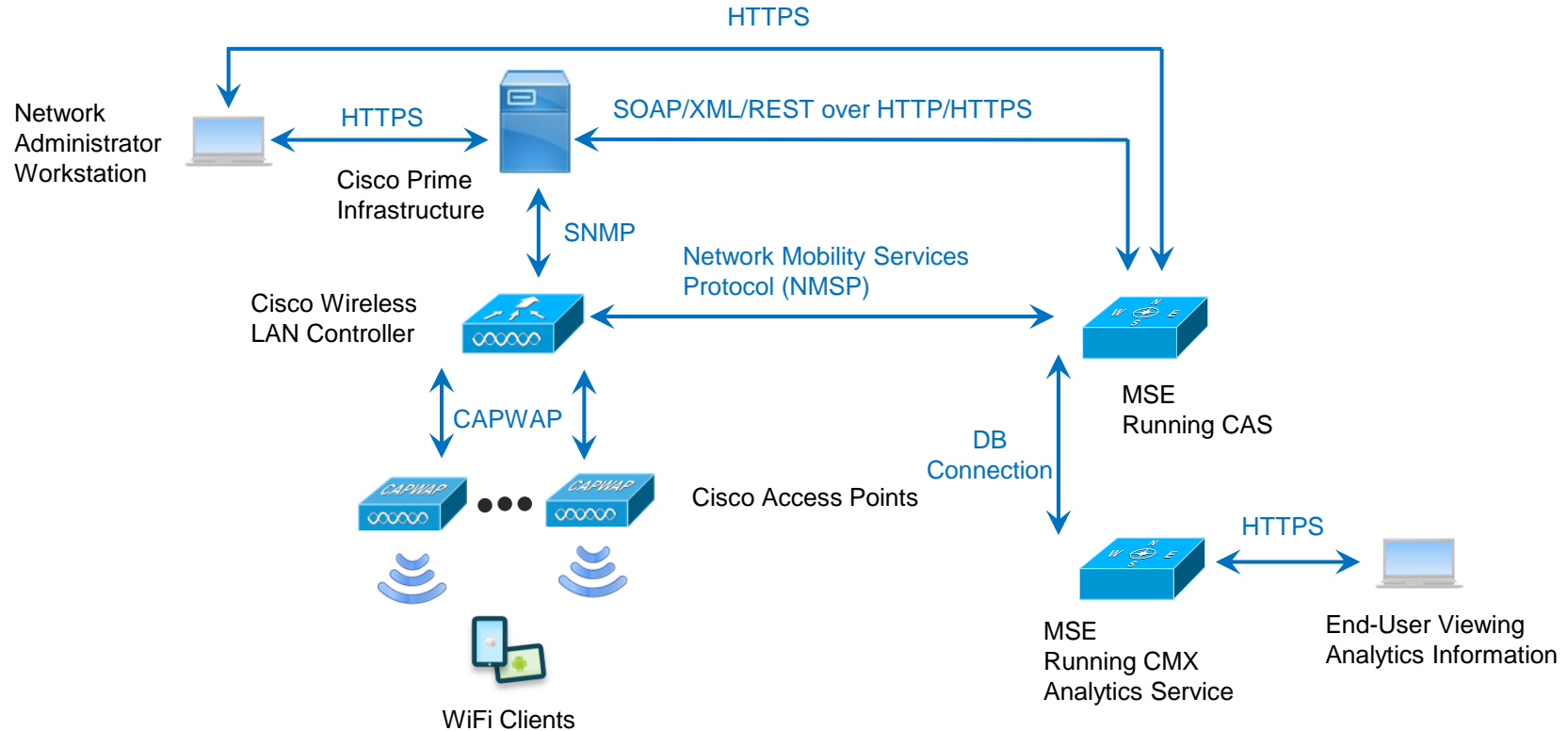


Common traffic patterns

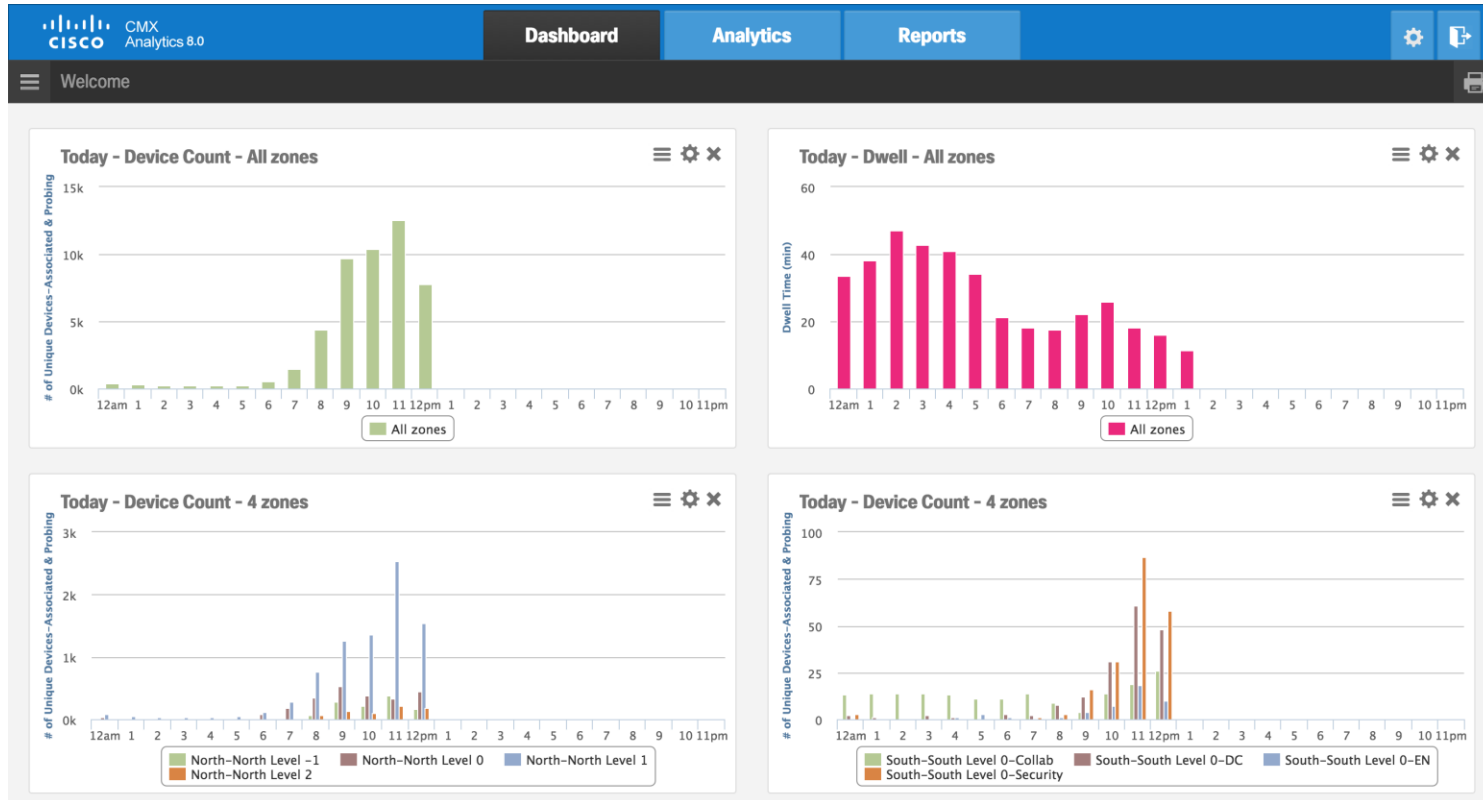


Where people spend time

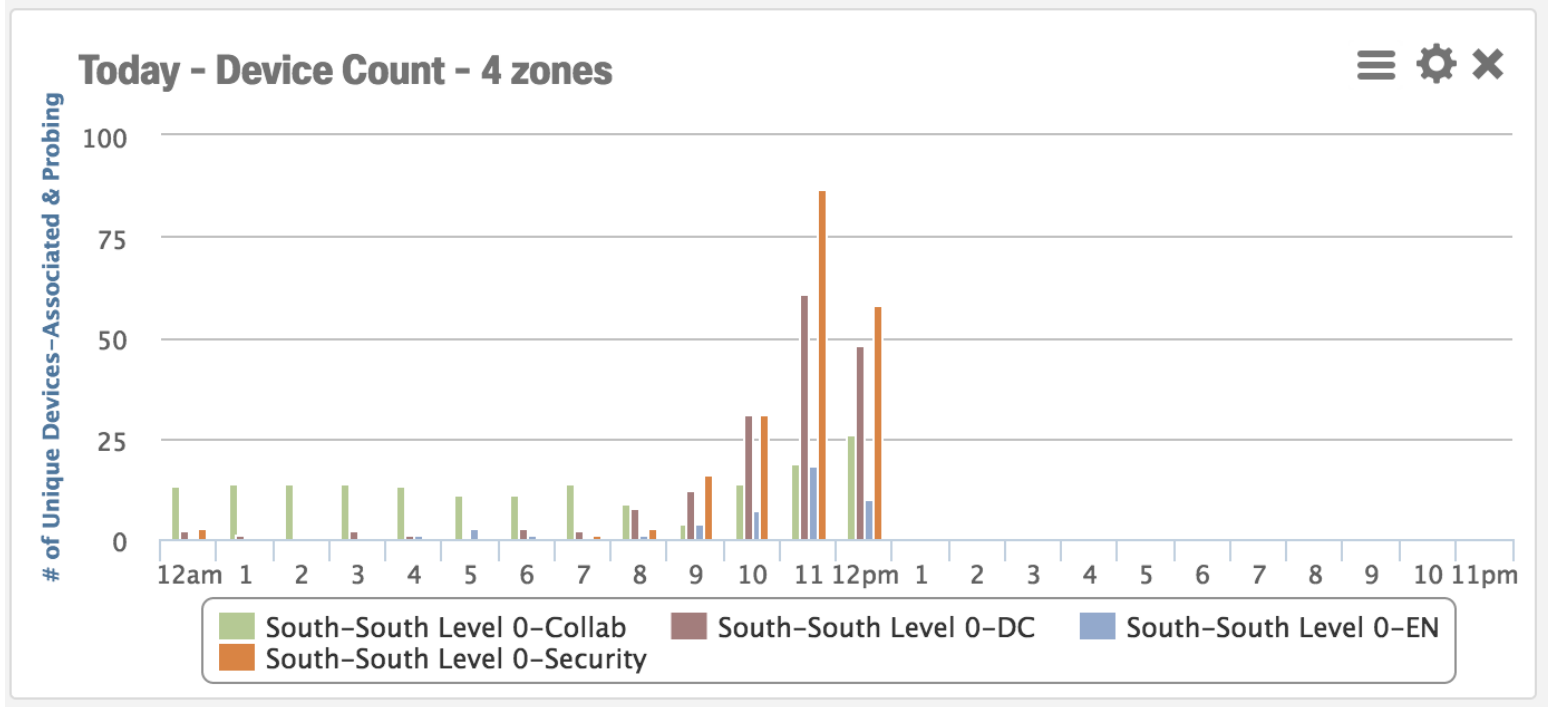
High-level overview of Hardware and Information Flows for CMX Location Analytics



CMX Analytics Dashboard



Multiple Zones Comparison in Dashboard



Report: Detected vs. Connected Devices



Preview - Analytics MSE 10



Enterprise Mobility Services Platform



Challenge for Today's Enterprise



Line of Business Challenges

- Delivering personalized content to drive sales and loyalty
- Incorporating existing application functionality into mobile apps
- Being able to get the application built quickly and affordably

IT is challenged delivering on the LOB needs and timelines....



Multiple Devices
and Platforms to
Support



Resource Intensive
Development



Scale Across
Locations, People
Environments



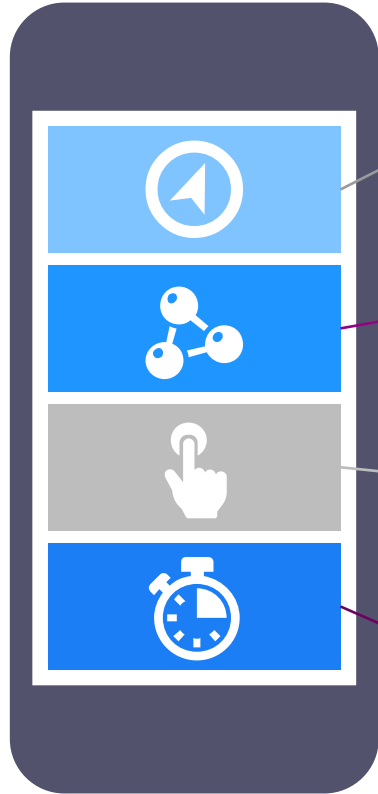
Deliver Highly
Secure Solutions

What Is Cisco EMSP?

The Cisco Enterprise Mobility Services Platform enables the rapid delivery of context-aware mobile experiences that exceed business and customer expectation. It binds Cisco network infrastructure capabilities with enterprise and open cloud systems, creating ready-to-use modules for mobile, web and native applications.



EMSP Delivers New Experiences



Gives applications context awareness, allowing customer engagement like never before

Prebuilt integration to infrastructure, applications and cloud services

Robust analytics and admin consoles that empower business users to manage content

Leverages real-time data to influence and drive behavior

Finding and Engaging Loyal Customers

Cisco EMSP in Retail

- Engage with shoppers when in store
- Differentiation between retail locations
- Flexibility for store manager to make updates to mobile experience/content

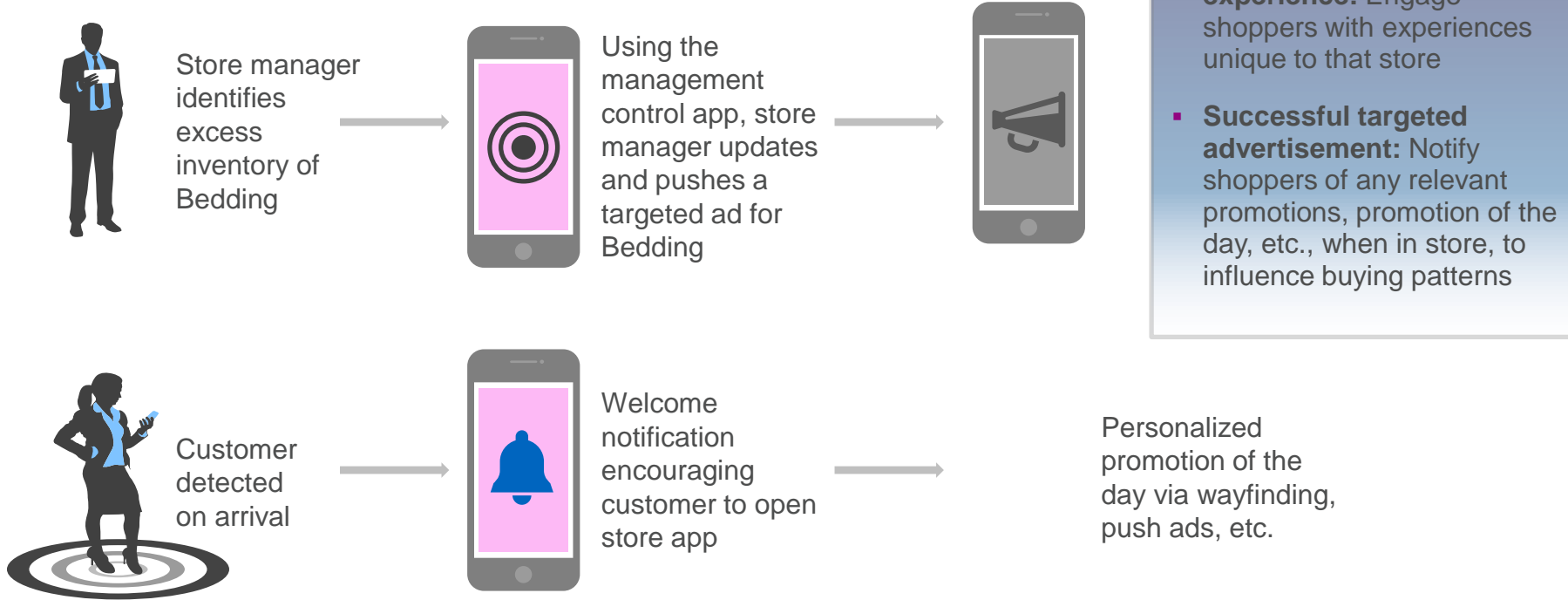


Finding and Engaging Loyal Customers

Cisco EMSP in Retail

Benefits

Proposed Solution (Workflow Enabled)



- **Superior customer experience:** Engage shoppers with experiences unique to that store
- **Successful targeted advertisement:** Notify shoppers of any relevant promotions, promotion of the day, etc., when in store, to influence buying patterns

Targeted Offers Delivered to your Application

Francisco Retail Store

Do you need assistance?
Ask a store expert.

Save on a Bundle
of baby must haves

Offer Ends
August 31

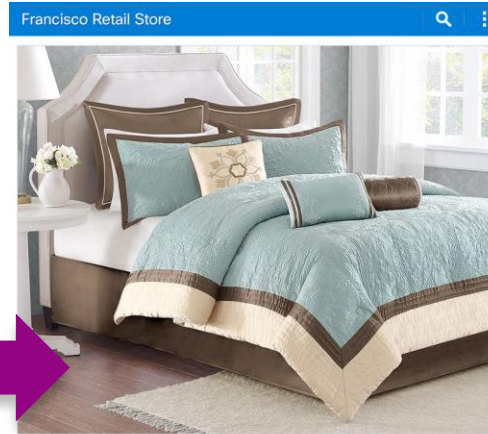
Shop the Catalog

Offers

Store Map

Scan

Search



Madison Park Melanie 9-pc. Comforter Set

Sale \$139.99
Original \$279.99

Rich accents and touchable fabrics make this comforter set a luxurious bedding addition.

Features

- 9-piece set
- Quilted charmeuse
- Embroidered details
- Borders & florals

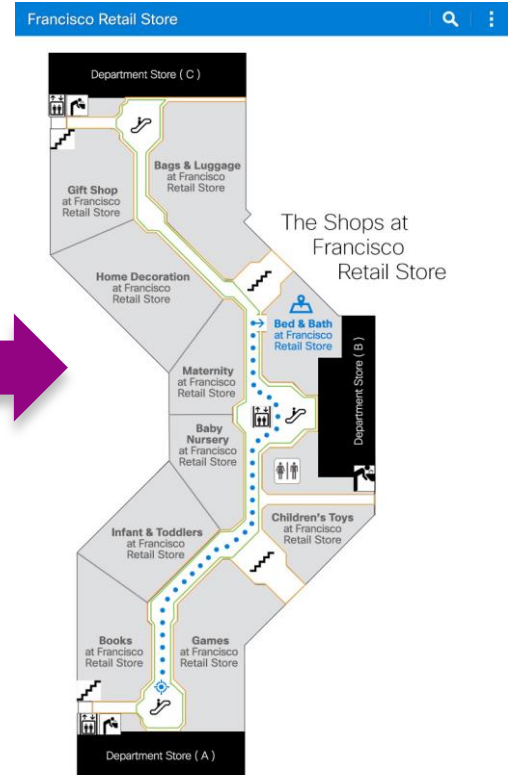
What's Included

- Comforter
- 2 shams, 2 Euro shams
- Bedskirt, Neck roll pillow
- Oblong pillow, Square pillow

Construction & Care

- Polyester
- Machine wash
- Imported

Get me there



EMSP Location Services



Geo Location

- Devise GPS via WiFi or cellular connectivity



Premise

- WiFi Access Point association

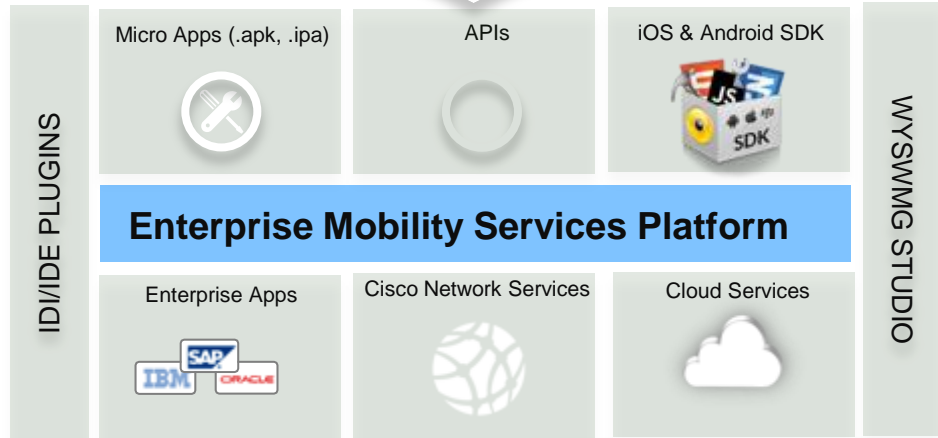


Zone (x,y,z)

- WiFi Triangulation
- BLE

Infra Requirements

Context Aware Mobile Experiences For The Hybrid Enterprise



Enterprise Service Mobility Platform delivers context aware mobile experiences by bringing together infrastructure, enterprise apps, and cloud services

Network Enriched Engaging Experiences

Leverage intelligent network services to deliver engaging context aware mobile experiences

Expose Cloud and App Services

Integrate, expose and mobilize business intelligence, cloud services, and enterprise app services

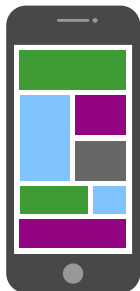
Operational Efficiencies

Pre-built, ready-to-use, and device agnostic application experiences to meet industry and LoB needs

Cisco EMSP Application Development

Native Application Development:

- Use EMSP Studio and app builder to develop iOS or Android native applications
- Leverage hundreds of pre-built experiences for rapid app development



Hybrid Application Development:

- Use the EMSP AppX SDK and Studio to provide feature rich hybrid application experiences embedded within your native application



Web Application Development:

- Use the EMSP Studio to rapidly build, host, and update web-based applications
- Primary vehicle to deliver context experiences





EMSP WiFi MX Demo



EMSP Dashboard

File Edit View Favorites Tools Help

WiFi-MX

Accounts

- Monitor
 - Engagement Report
- Configure
 - SSIDs
 - Locations
 - Experience Zones
 - Maps
- Create
 - Portals**
 - Micosites
- Manage Users
 - Users

Portals » Cisco Connect UAE

Select a section to configure. Drag & drop to reorder items within the menu.

Export Style sheet Editor

Brand name Notice Configure in : ON

Notice

- Ticker Text Only
- Text Only
- Text with Image

Notice text

What do you want to see connected?
Connecting the Unconnected Cisco -

Hide After

Jan/13/2016 10:17 AM

Preview

Choose Experience Zone

Roll over to magnify

EMSP Demo

- Connect to SSID
- Login with your E-Mail
 - Subscribe to SMS Service

For more details visit the
Enterprise Networks Demo Booth



Mobility Services API

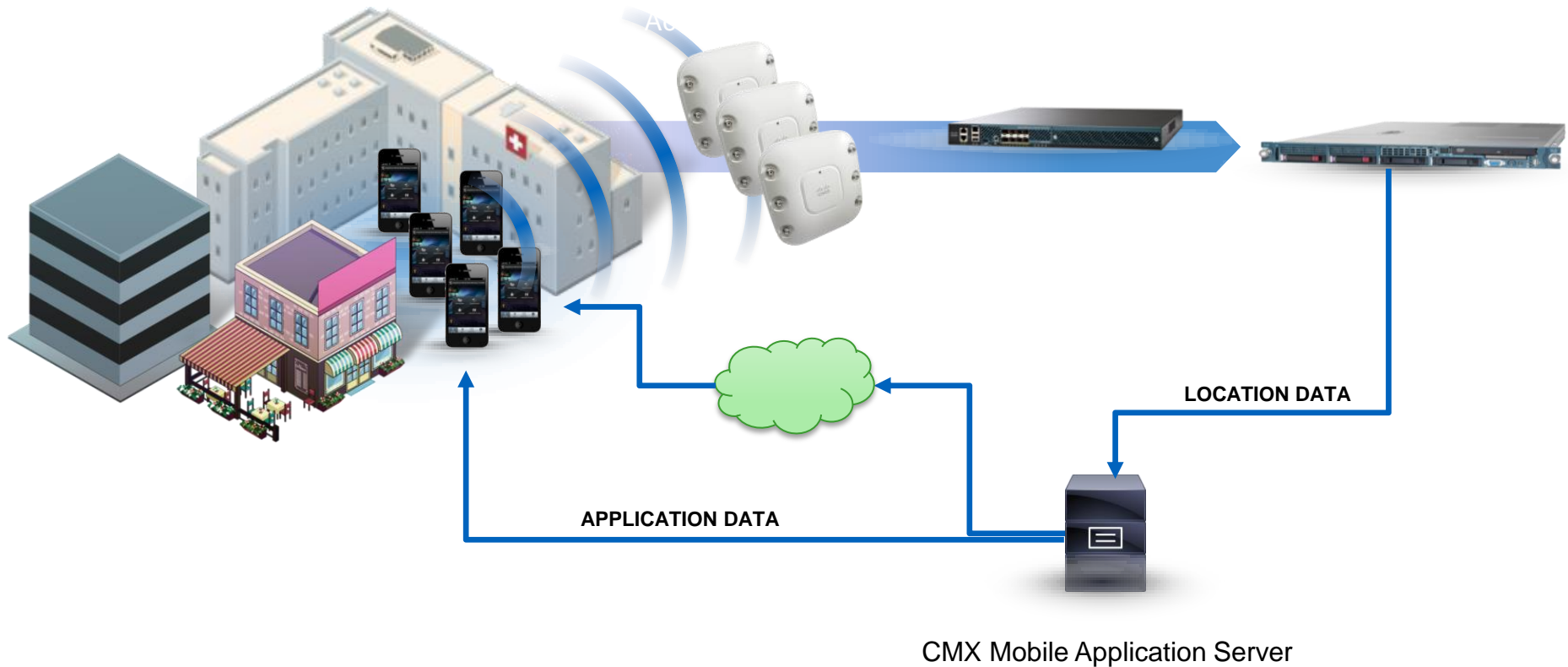


Mobility Services API and CMX App SDK

- Supports SOAP/XML and REST (new)
- Exposes current and historical location information for tracked devices
- Enables numerous use cases – apps, analytics, equipment tracking, etc.
- Offers a pull model: XML or JSON, based on the requesting client
- Offers a push model: XML, JSON, and protocol buffer formats Can be streamed over HTTP, HTTPs, or TCP



Mobility Services SDK

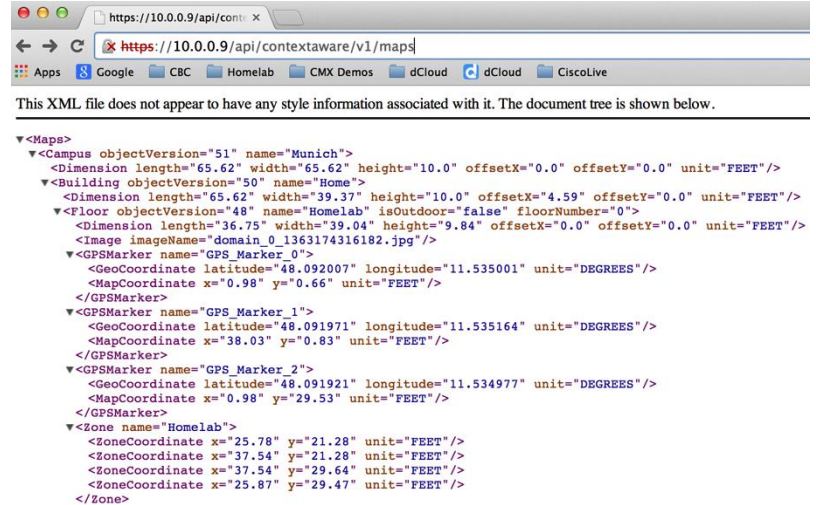


CMX Tools: API



REST API - Examples

- Just use your Webbrowser to:
 - Get Maps Information:
 - <https://MSE-IP/api/contextaware/v1/maps>
 - Get Map Image:
 - https://MSE-IP/api/contextaware/v1/maps/imagesource/domain_0_1363174316182.jpg

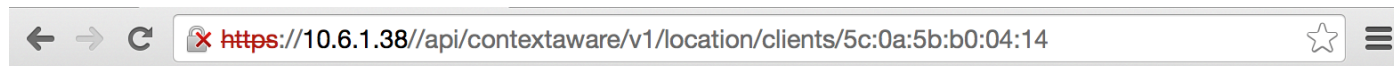


The screenshot shows a web browser window with the address bar containing `https://10.0.0.9/api/contextaware/v1/maps`. Below the browser window, a message states: "This XML file does not appear to have any style information associated with it. The document tree is shown below." The XML document tree is displayed with the following structure:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<Maps>
  <Campus objectVersion="51" name="Munich">
    <Dimension length="65.62" width="65.62" height="10.0" offsetX="0.0" offsetY="0.0" unit="FEET"/>
  </Campus>
  <Building objectVersion="50" name="Home">
    <Dimension length="65.62" width="39.37" height="10.0" offsetX="4.59" offsetY="0.0" unit="FEET"/>
  </Building>
  <Floor objectVersion="48" name="Homelab" isOutdoor="false" floorNumber="0">
    <Dimension length="36.75" width="39.04" height="9.84" offsetX="0.0" offsetY="0.0" unit="FEET"/>
    <Image imageName="domain_0_1363174316182.jpg"/>
    <GPSMarker name="GPS_Marker_0">
      <GeoCoordinate latitude="48.092007" longitude="11.535001" unit="DEGREES"/>
      <MapCoordinate x="0.98" y="0.66" unit="FEET"/>
    </GPSMarker>
    <GPSMarker name="GPS_Marker_1">
      <GeoCoordinate latitude="48.091971" longitude="11.535164" unit="DEGREES"/>
      <MapCoordinate x="38.03" y="0.83" unit="FEET"/>
    </GPSMarker>
    <GPSMarker name="GPS_Marker_2">
      <GeoCoordinate latitude="48.091921" longitude="11.534977" unit="DEGREES"/>
      <MapCoordinate x="0.98" y="29.53" unit="FEET"/>
    </GPSMarker>
    <Zone name="Homelab">
      <ZoneCoordinate x="25.78" y="21.28" unit="FEET"/>
      <ZoneCoordinate x="37.54" y="21.28" unit="FEET"/>
      <ZoneCoordinate x="37.54" y="29.64" unit="FEET"/>
      <ZoneCoordinate x="25.87" y="29.47" unit="FEET"/>
    </Zone>
  </Floor>
</Maps>
```

REST API - Examples

- Get Client Location by MAC Address:
- <https://MSE-IP/api/contextaware/v1/location/clients/5c:0a:5b:b0:04:14>



This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<WirelessClientLocation ipAddress="10.4.0.208 2001:4d38:000a:0400:9092:f856:137b:6f32
fe80:0000:0000:0000:5e0a:5bff:feb0:0414" ssId="CiscoLive2015" band="UNKNOWN"
apMacAddress="88:f0:31:e6:a2:40" isGuestUser="false" dot11Status="ASSOCIATED"
macAddress="5c:0a:5b:b0:04:14" currentlyTracked="true" confidenceFactor="408.0">
  <MapInfo mapHierarchyString="CiscoLive15>North>North Level 2" floorRefId="722265958470648216">
    <Dimension length="344.4882" width="208.9895" height="20.013123" offsetX="0.0" offsetY="0.0"
    unit="FEET"/>
    <Image imageName="domain_0_1421935977959.png"/>
  </MapInfo>
  <MapCoordinate x="94.86" y="54.41" unit="FEET"/>
  <Statistics currentServerTime="2015-01-23T15:12:14.448+0100" firstLocatedTime="2015-01-
23T15:05:22.267+0100" lastLocatedTime="2015-01-23T15:12:12.563+0100"/>
  <GeoCoordinate latitude="45.48134772" longitude="9.1548982565" unit="DEGREES"/>
</WirelessClientLocation>
```




CISCO



Dubai, UAE
February 18-19, 2015

*TOMORROW
starts here.*

HALO Module is a Mainstream AoA Solution



- Halo module wraps around AP
- 32 extra antennas to turbo-charge Angle of Arrival
- The Halo module will include Bluetooth capability as well

Analytics Configuration

- Enable History Logging for Client Stations on Context Aware MSE

The screenshot displays the Cisco Connect Analytics Configuration interface. The top navigation bar is blue with the Cisco logo and 'Home' on the left, and 'Admin' on the right. A left sidebar contains a menu with 'SYSTEM' and 'CONTEXT AWARE SERVICE' sections. Under 'CONTEXT AWARE SERVICE', 'History' is selected and highlighted in blue. Below the sidebar, the main content area is titled 'History Params'. It features three rows of configuration options: 1) 'Archive for' with a text input '30' and a label '1 - 365 days'. 2) 'Prune data starting at' with text inputs '23' (hours), '50' (minutes), and '1440' (minutes), with the label 'and also every'. 3) 'Enable History Logging of Location Transitions for' with a list of checkboxes: 'Client Stations' (checked), 'Wired Stations', 'Asset Tags', 'Rogue Access Points', 'Rogue Clients', and 'Interferers'. At the bottom of the configuration area are 'Save' and 'Cancel' buttons.

Fan Wifi On-boarding In-Stadium

Business Problem

- Mode to publish Mobile apps to non-frequent fans In- Stadium
- Capture new fans coming into the Stadium
- Visibility to In-Stadium activity



Fan connects on SSID and opens browser



WLC re-directs the https session to EMSP web portal



The user to the device mapping is noted on EMSP



Stadiums can track Fan activity when In-Stadiums moving forward

Solution Pre-requisites

- ▶ Cisco WLAN Infrastructure Design for Location Capability
- ▶ CMX provides location info
- ▶ CRM with fan history Dbs w/API Integration capability

Business Outcomes

- ▶ Personalized experience – Based on Profile and Likes
- ▶ In-Stadium Analytics- Track behavior and actions



EMSP Cisco Infrastructure Requirements

Feature	Infrastructure Requirements
Mobile Application Development (Native, Hybrid, Web)	N/A, infra independent
WiFi Engage Portal w/ Location based web experience*	Meraki: <ul style="list-style-type: none">• Wireless LAN Cloud Controller• Minimum of 1 AP (MR12, MR18, MR26, MR34, MR62, MR66) Cisco: <ul style="list-style-type: none">• Wireless LAN Controller• Minimum of 1 AP (Aironet 700, 1700, 2700, 3700)• MSE 7.6 or 8.0 (highly recommended)
Location Services API's ('where am I', POI, etc)	Cisco: <ul style="list-style-type: none">• Wireless LAN Controller• Minimum of 4 (high density) AP's (Aironet 1700, 2700, 3700) w/ Fast Locate Modules/WSM• MSE 8.0

*The minimum bandwidth cap we recommend is 5mbps per user to ensure the initial page load experience is acceptable. With a 1:3 sharing, 50mbps can support ~30 users connecting simultaneously

EMSP Deployment Requirements

Tool	Requirements	
EMSP Studio	Operating System	MAC OS 10.6 and above (64 bit) Microsoft Windows XP and above (32bit)
	RAM	2GB
	Other	Adobe Air v15 Adobe Flash v15
EMSP Development Studio	Operating Systems	MAC OS 10.6 and above (64bit) Microsoft Windows XP and above (32bit)
	RAM	2 GB
	Java Environment	Java Development Kit 1.6.x
	Database	MySQL 5.5 and above
WiFi Engage Portal	N/A, full cloud hosted solution	
Location Services API's	N/A, full cloud hosted solution	
Cisco Integration Platform – ESB	Hardware Requirements	<ul style="list-style-type: none"> • 2GHz, dual-core CPU, or 2 virtual CPUs in virtualized environments • 2GB of RAM • 4GB of storage
	Java Runtime Environments	<ul style="list-style-type: none"> • Oracle Java 1.6 • Oracle Java 1.7 • IBM Java 1.6
	Operating Systems	Windows (32- and 64-bit) 2003, 2008, Windows 7, Windows 2012 Mac OS 10.7, 10.8 Linux RHEL (64-bit) 5.3, 6.1 Ubuntu Server 12.04 (64-bit) Solaris OS 10 HP-UX 11i V3 AIX V7.1

CMX Connect



Location-Specific Guest Access



Simplify Access with User Opt-In
Offer Clear Terms and Conditions



Multiple Access Methods
Custom or Social Media



Customized Access and Promotion
Proximity-Based Landing Pages and Video



Understand Who Is in Your Location
Enhanced Analytics

Location-Specific Guest Access – Cisco CMX Connect



- Customize the Wi-Fi guest access experience
- Gain valuable analytics about who is in venue
- Simplify the user experience while offering clear terms and conditions

A registration form titled "Shopping Mall" with a red header. It contains two input fields: "Your Name*" and "Your Phone Number*". Below these is a section for "Terms and Conditions: [-]" with a text area containing a welcome message and terms. At the bottom, there is a "Submit" button and a line of text: "By clicking Submit, I accept the Terms & Conditions".A simplified login page titled "Sign in with Social Networks" with a red header. It features three large buttons: "Login with Facebook", "Login with LinkedIn", and "Login with Google". Below these buttons is a link that says "No thanks. Continue browsing >>". At the bottom, it says "Powered by Cisco CMX".

Registration, Terms, and Conditions

Custom Landing Page/Video

Simplified Login

Captive Portal Configuration

- Login to: <https://mse/dashboard/>

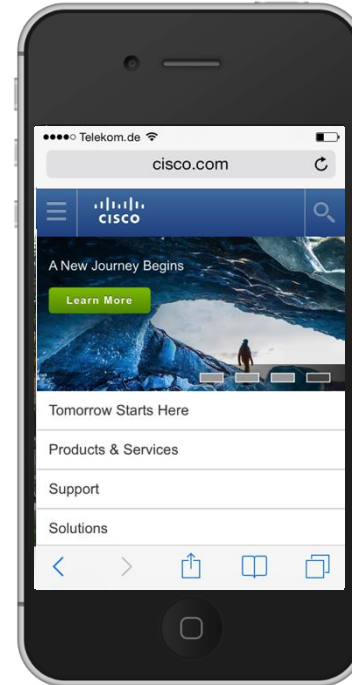
The screenshot displays the Cisco CMX Connect & Engage dashboard. The top navigation bar is blue with the Cisco logo and the text "CMX Connect & Engage" on the left, and "My Account Logout" on the right. A dark sidebar on the left contains a menu with the following items: Summary, Visitor Connect (with sub-items: Splash Templates, Template Fields, Social Connectors, Third Party Advertisement), Facebook Wi-Fi, Visitor Policy, Maps, Mobile App, Accounts, and Settings. The main content area is titled "Splash Template Configuration" and features a section titled "Splash Templates". Below this title, a four-step process is outlined:

- STEP: 1** (Optional) Create **Template Fields**
if you would like to collect information from visitors as part of registration.
- STEP: 2** (Optional) Create **Social Connectors**
if you would like to offer Social Network Authentication such as Facebook, Google+, and LinkedIn.
- STEP: 3** Create **Splash Templates** in the table below and attach Template Fields and/or Social Connectors to them.
- STEP: 4** Assign the **Splash Template** to one or more locations inside **Maps**.

Below the steps, a note states: "The first Splash Template you create will be your Default Template." Another note explains: "When determining which Splash Template to use, MSE will select the template belonging to the location of the highest granularity that the guest-user is in. If that location does not have a Splash Template, MSE will look for that location's parent for a Splash Template instead, repeating as needed until finally reaching the Default Template." A final note specifies: "The hierarchy is Zone -> Floor -> Venue -> Campus. You can change the Default Template designation in the table below."

Login Procedure – First Login

- User connects to SSID
- User opens Safari
- Redirect to Captive Portal
 - User enters E-Mail etc.
- Play Advertisement Video
 - User can skip after 10sec
- Select Social Login and enter credentials
- Redirect to original page or Redirect URL



Guest Access – Cisco CMX for Facebook Wi-Fi



- Increase brand recognition and gain insights through Facebook Wi-Fi.
- User connects to Wi-Fi, opens browser, and checks in.
- Venue gains exposure through news feeds, notifying friends.

