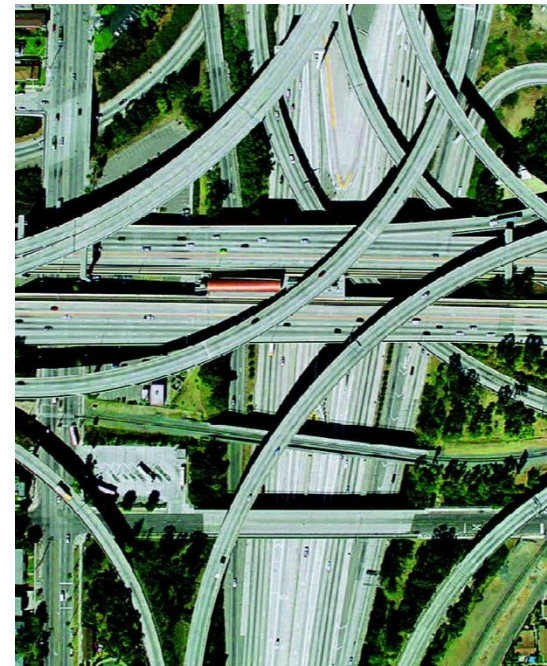
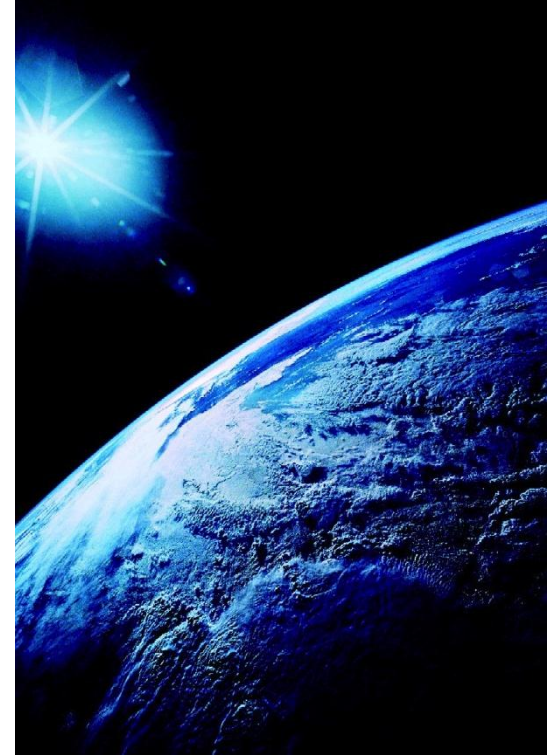


Mobility everywhere

Towards seamless WiFi and 3G/4G integration

Pablo Prieto



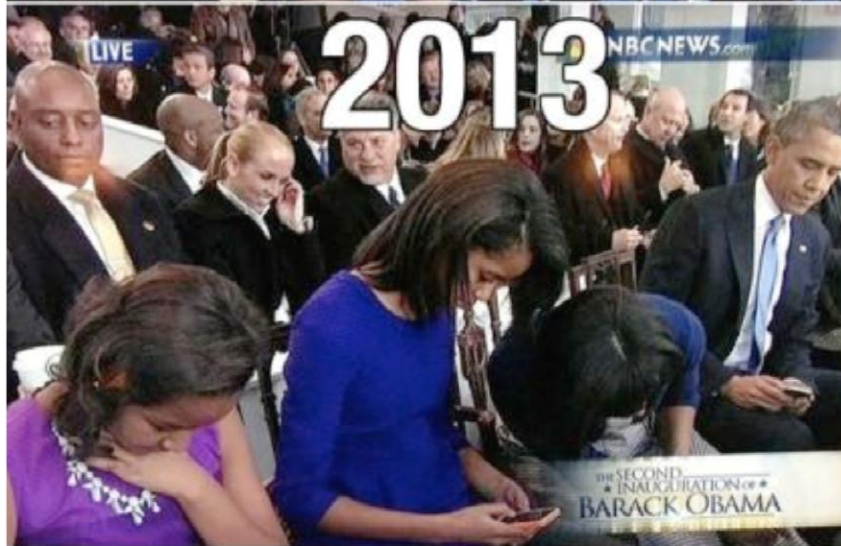
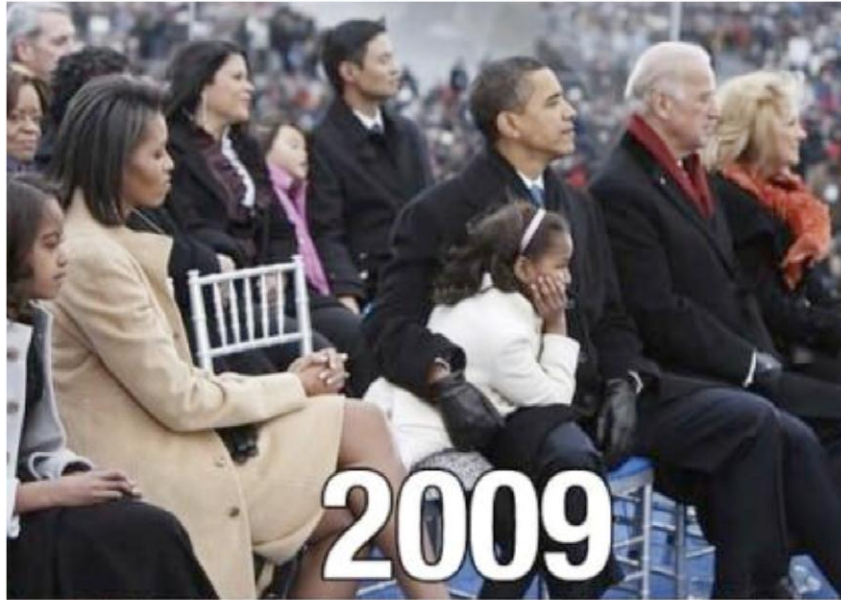
Agenda

- ✓ Mobile data traffic rise
- ✓ Cisco's carrier grade solution for WiFi
- ✓ Mobility Everywhere, delivery of Data in Motion

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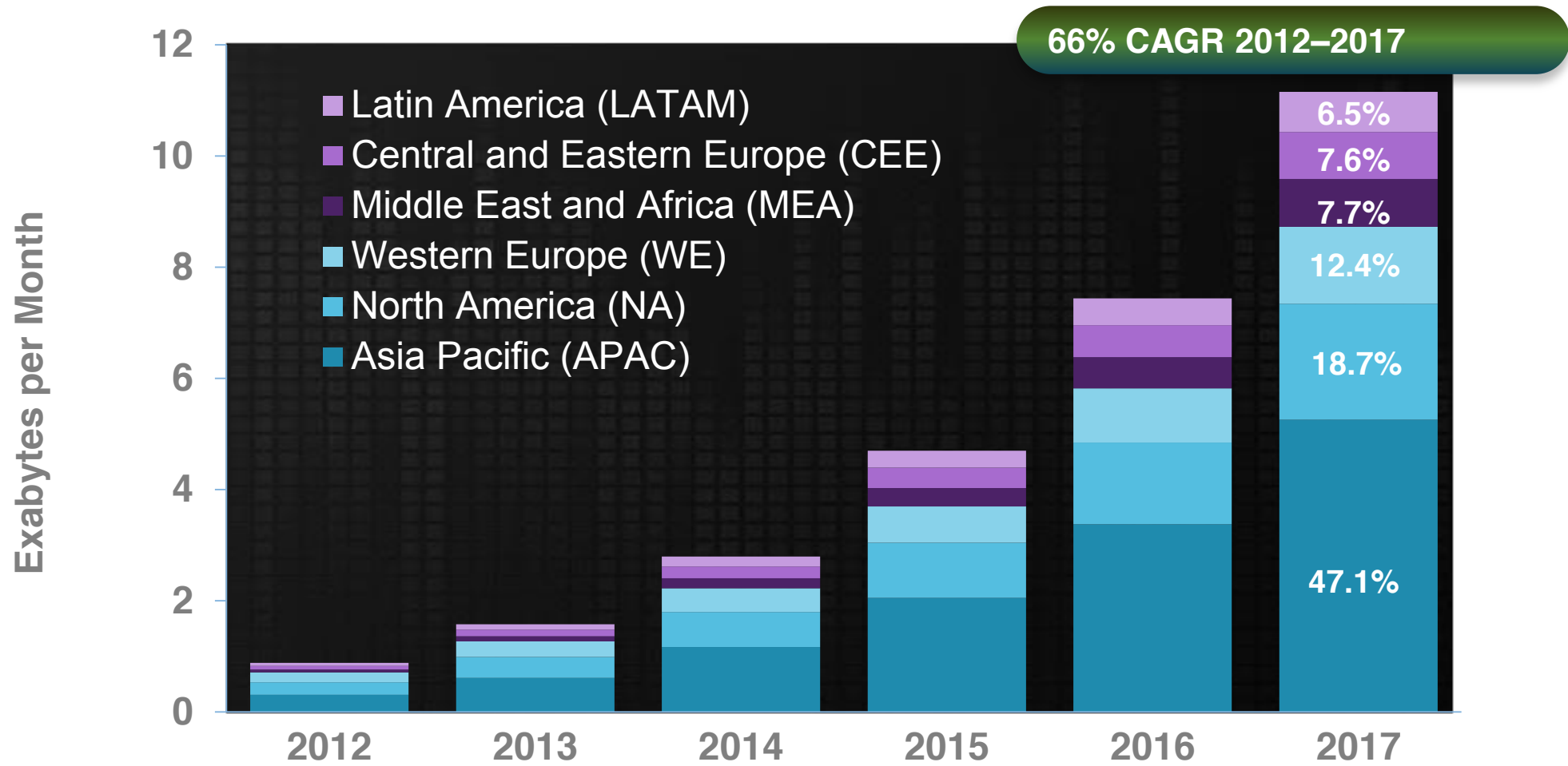
Mobility everywhere



Global Mobile Data Traffic Growth / Regions

MEA has the Highest Growth Rate (77%) from 2012–2017

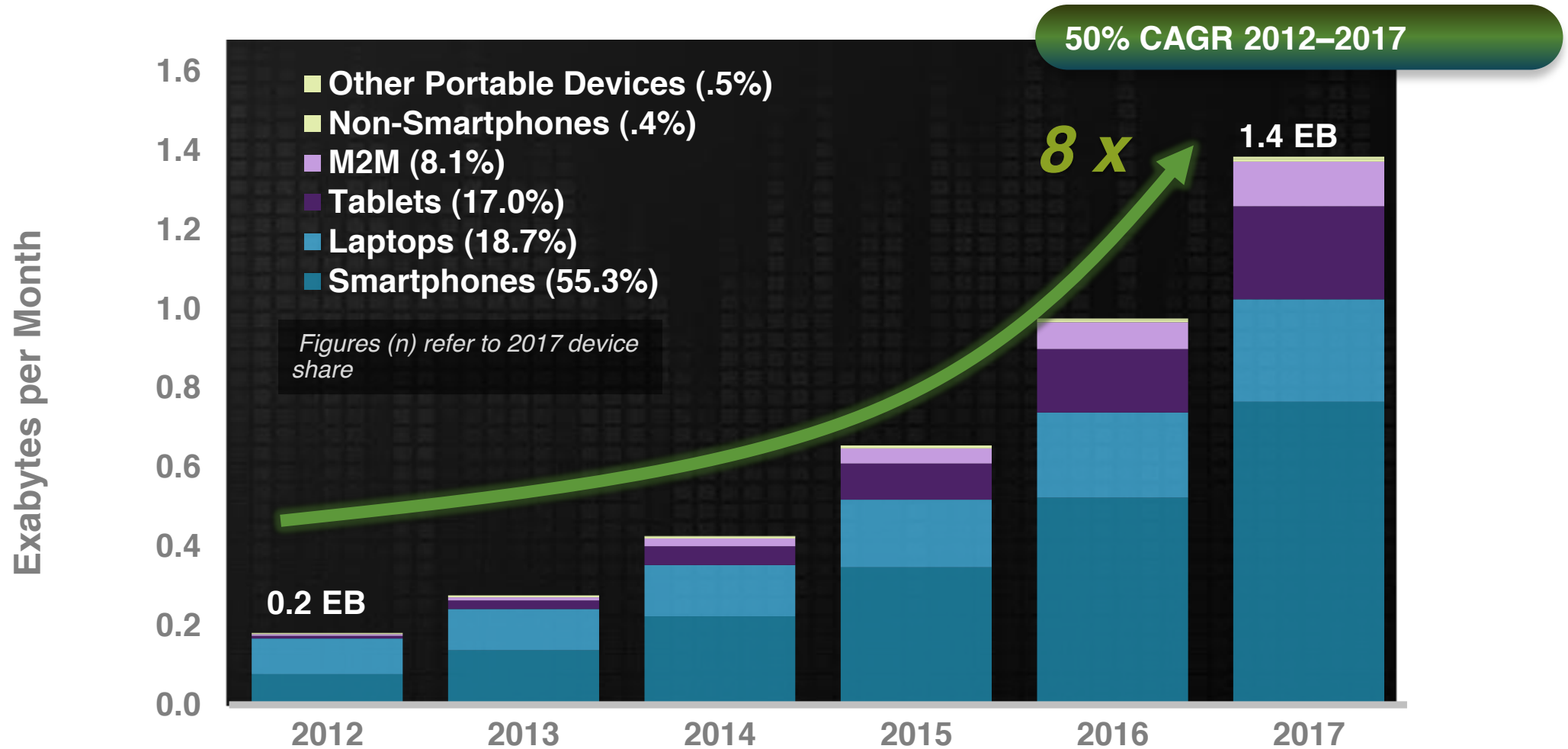
APAC will Generate 47% of all Mobile Data Traffic by 2017



Source: Cisco VNI Global Mobile Data Traffic Forecast, 2012–2017

WE Mobile Data Traffic Growth by Device

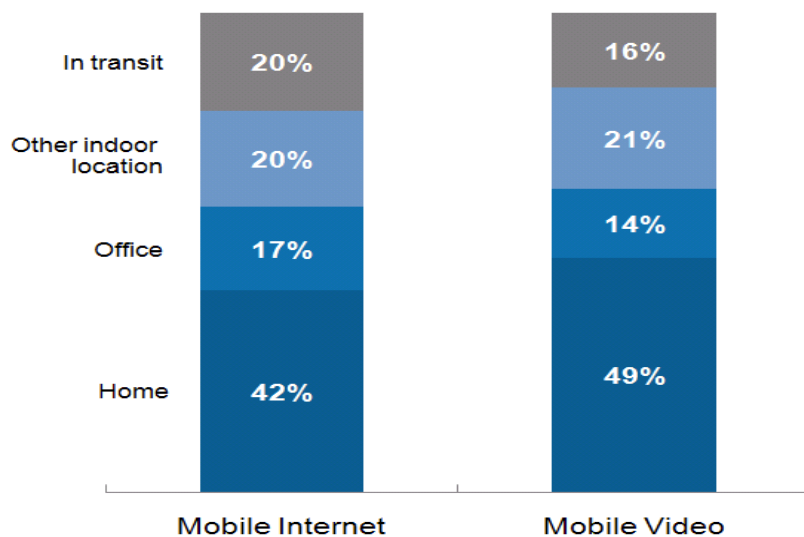
In 2013, Smartphone Traffic Surpass Mobile Laptop Traffic



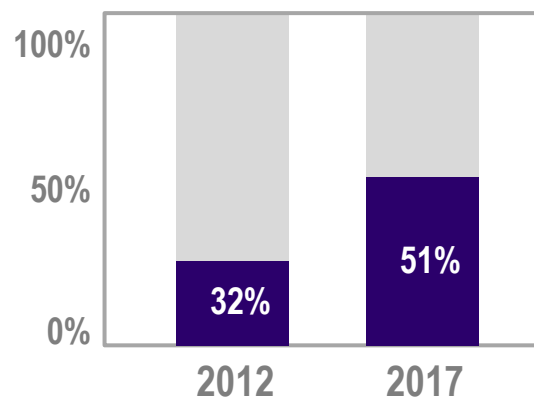
Source: Cisco VNI Global Mobile Data Traffic Forecast, 2012–2017

Wi-Fi is a User-Driven Trend

80% of the time users are **nomadic**



32% of mobile data traffic usage is offloaded

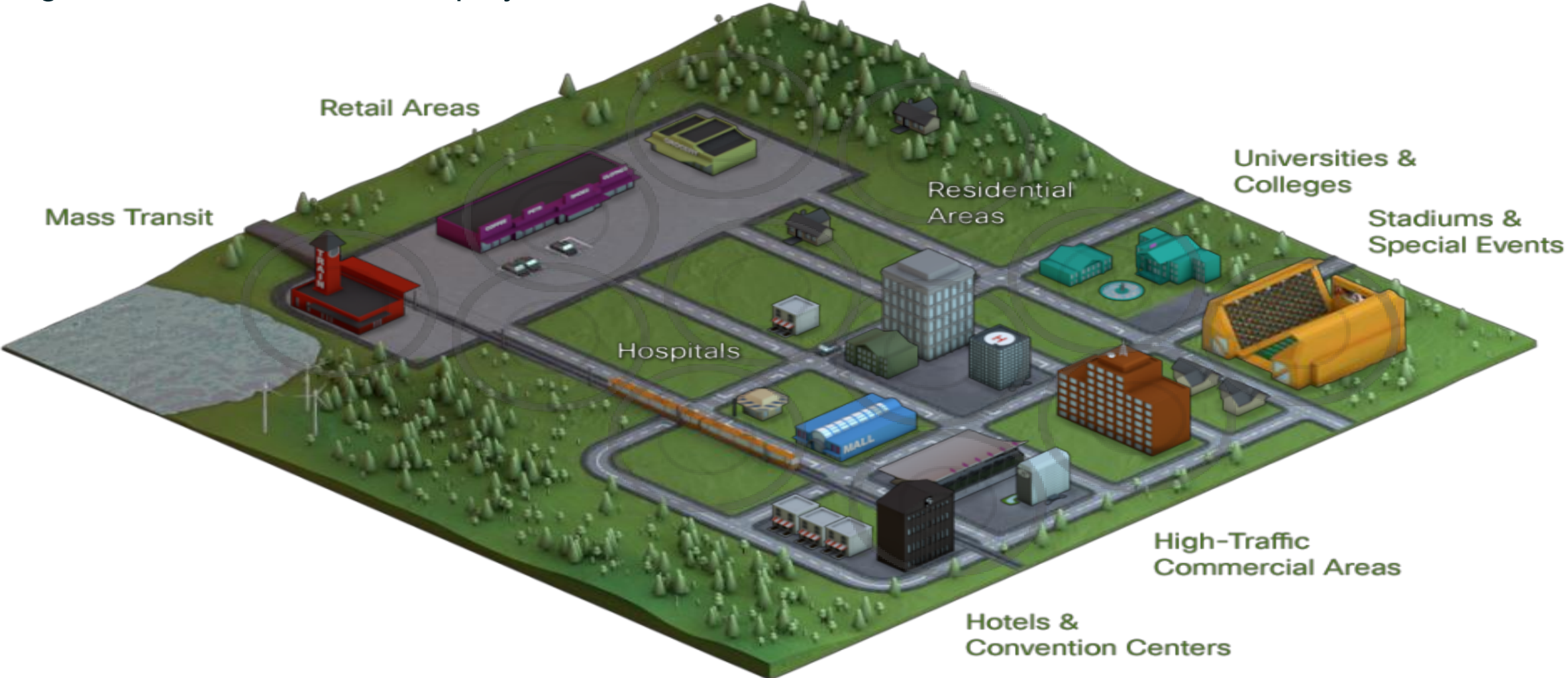


19 out of 20 smartphones support Wi-Fi
90% of iPads sold are Wi-Fi only



Demand is not geographically uniform

Target areas for Small Cell deployments

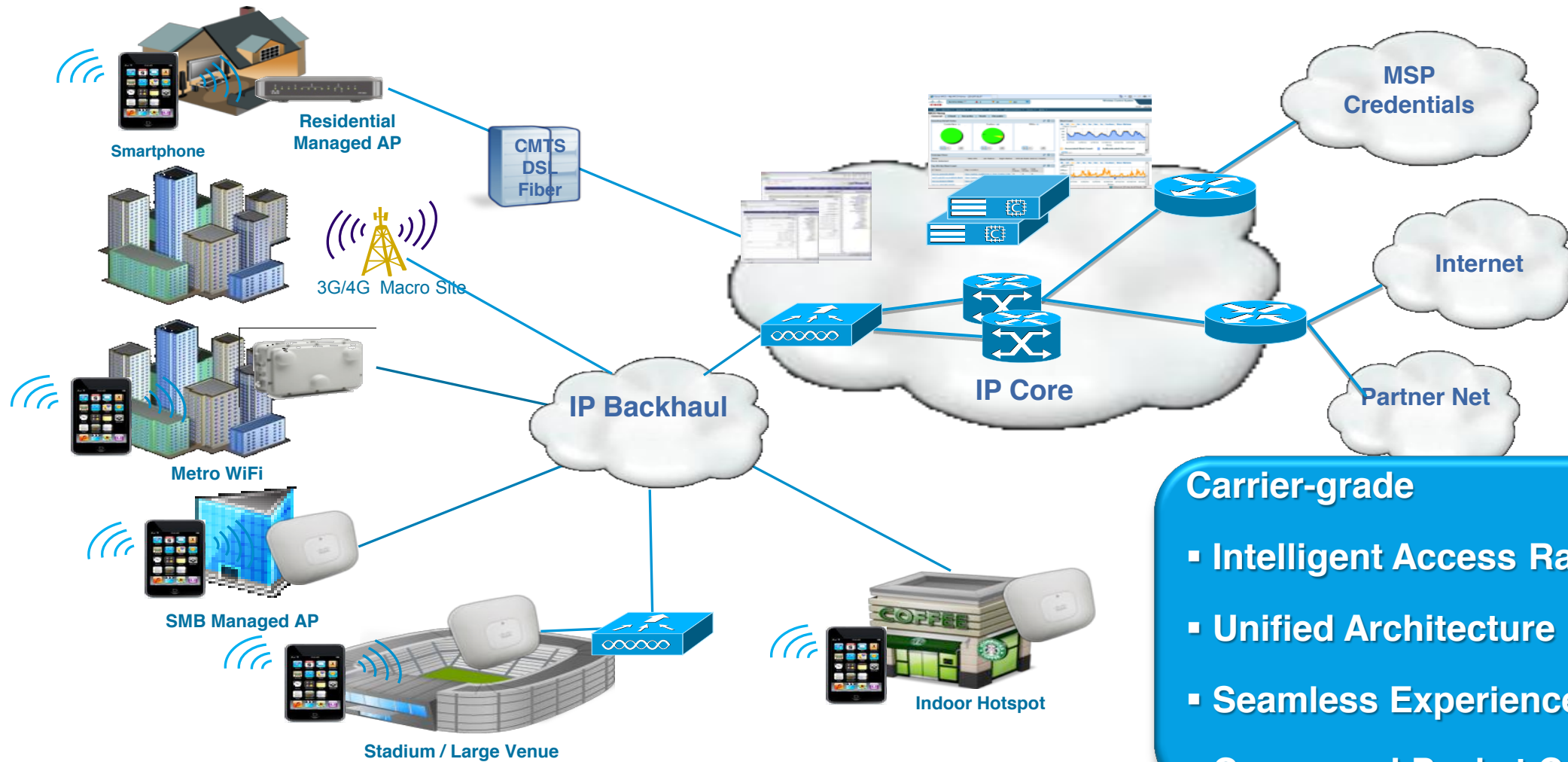


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Service Provider Wi-Fi

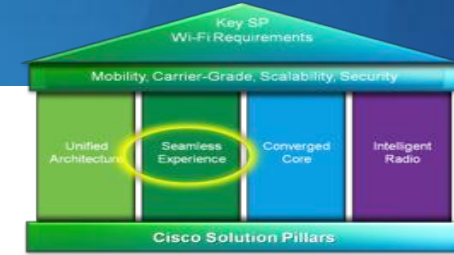
Complements 2G, 3G, 4G



Carrier-grade

- Intelligent Access Radio
- Unified Architecture
- Seamless Experience
- Converged Packet Core

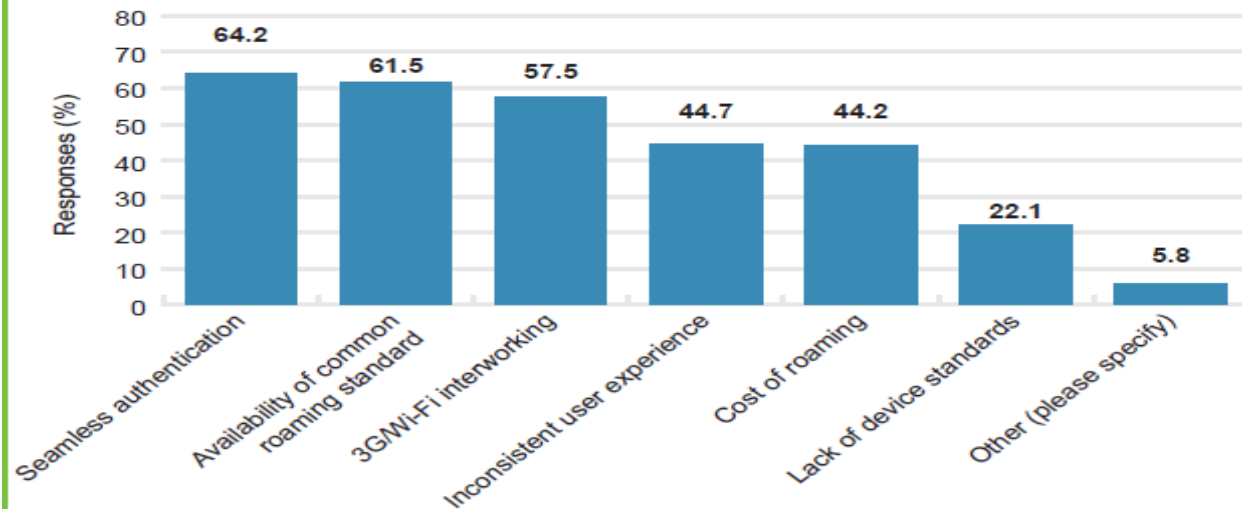
The Barriers ...



Top barriers to wider implementation of Wi-Fi roaming:

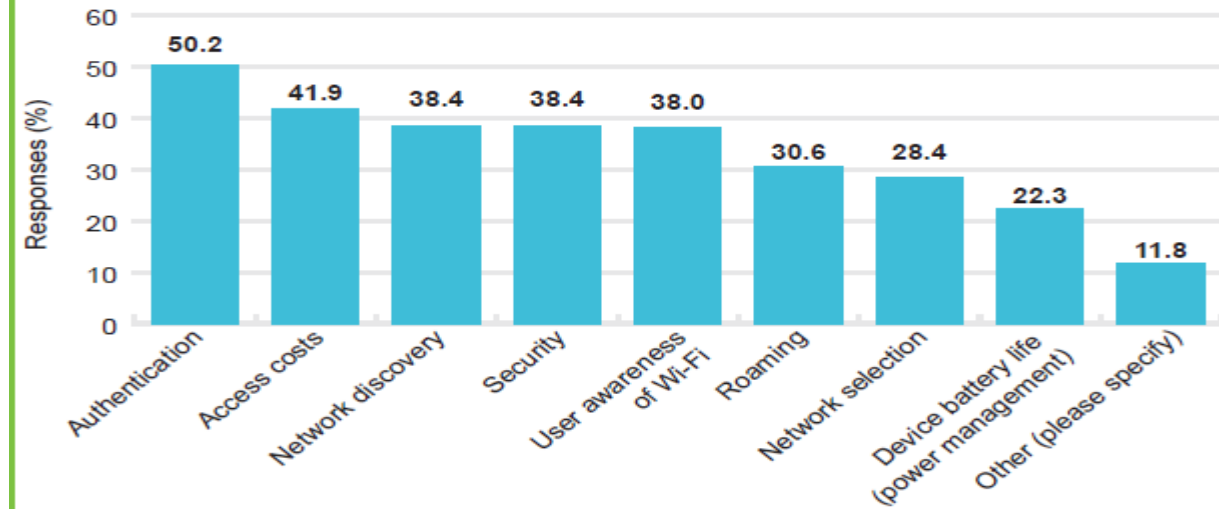
Top barriers to further adoption and usage of Wi-Fi:

Fig. 15: What do you consider to be the three most significant barriers to a wider implementation of Wi-Fi roaming?



Source: WBA-ITM survey, Oct-11

Fig. 14: What do you consider to be the top three barriers to wider adoption and usage of Wi-Fi among end users?



Source: WBA-ITM survey, Oct-11

- ❑ Network discovery, identification, connection, authentication and security all key for seamless integration of Wi-Fi and cellular networks

AP Discovery problem

SSID Explosion in Metro area

End User Problem

Similar SSID names

SSID - open

SSID - encrypted

SSID – Super* Premium*

User cannot find right SSID

Rogue SSID

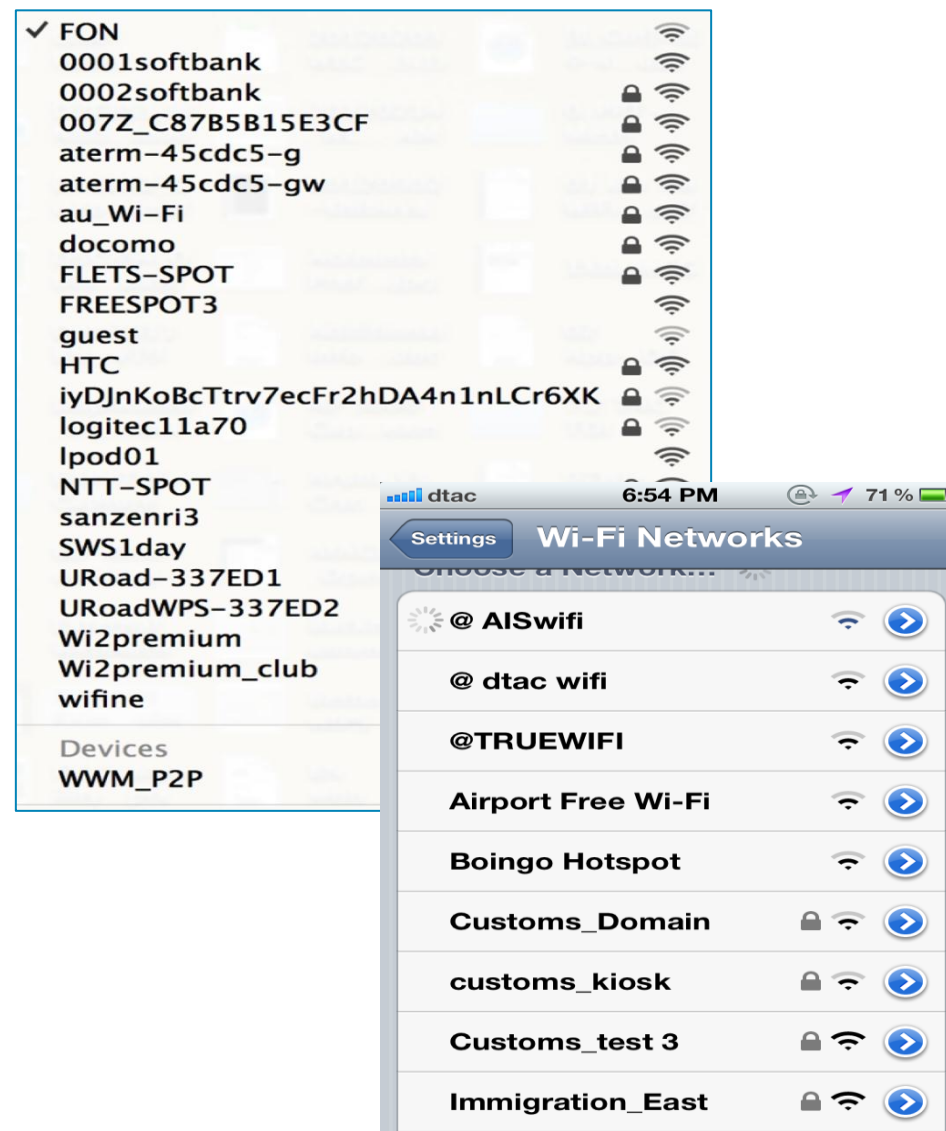
Trust or UnTrust?

Additional Battery Consumption at handset

Operator Concern

Display operator SSID

Promote own SSID



What is WiFi Passpoint? = Smart WiFi



How to change “SSID” for better user experience.

Smart WiFi device – Smart AP discovery & selection

Secure Browsing in your HotSpot - WPA2-AES for all time

Device/User registration and provisioning

Before-After How Passpoint will change WiFi Connection

	Traditional WiFi	Passpoint-based WiFi
Discovery	Probe Scanning	Query(ANQP) based
Network Name	SSID	Realm Name or 3GPP CI
Connection Priority	No priority control – manual only	Priority list from Home operator or manual override by end-user
User GUI Setup	Text-based Selection	GUI with Service Provider Icon

Automated WiFi Connection on the go

Manual Setup

1. Power On or Unlock the phone
2. Select WiFi network from pop-up but has vulnerability to access Rogue AP*
3. Go to Web-auth
4. Browse Web-page and had to put right credential usually ID/PWD
5. Choose roaming plan
6. Start Internet



Automatic Setup

1. Power On or Unlock the phone
2. Handset automatically validate network and initiate connection and
Use Internet with super WiFi speed!

- 802.11u enabled WLAN can support non-11u devices
- 802.11u Network information exchange makes WiFi experiences seamless, hassle free connection!

*Rogue AP type : Honeypot, Evil Twin, Multipot etc..

Next-Generation HotSpot (802.11u):

Roam, Authenticate, Monetize



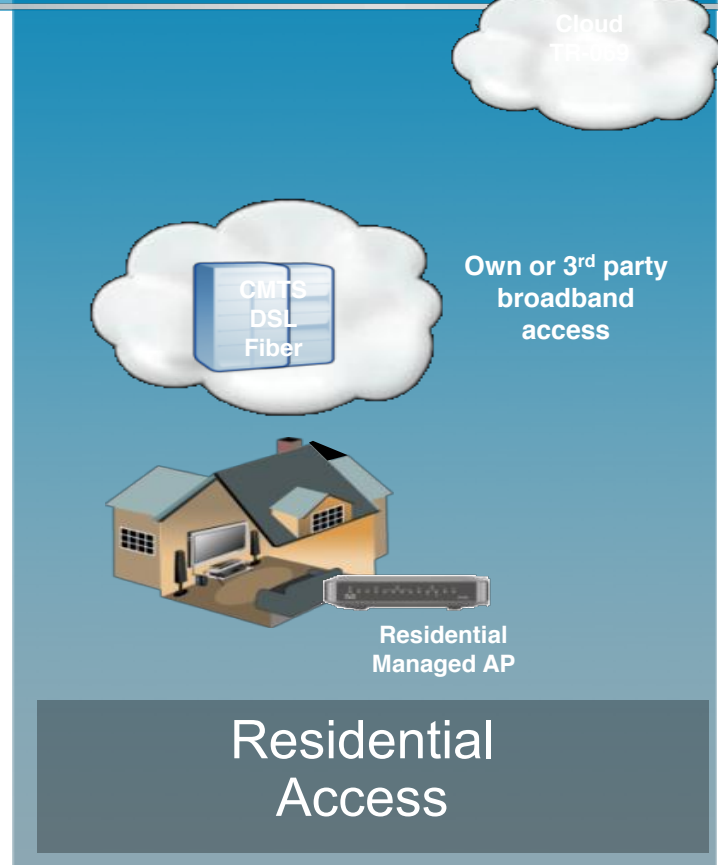
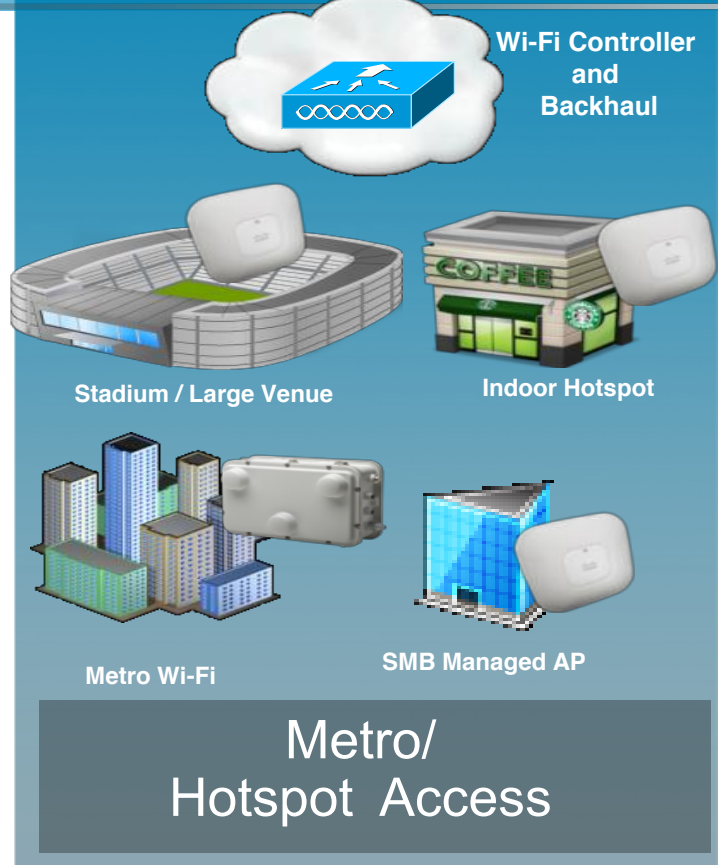
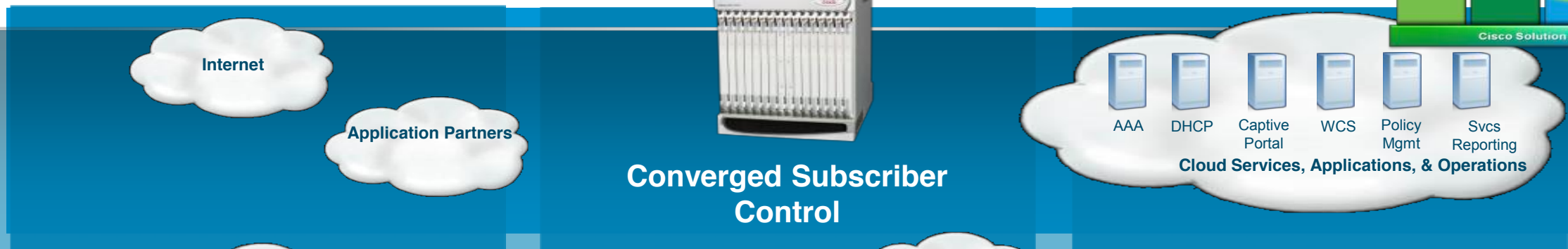
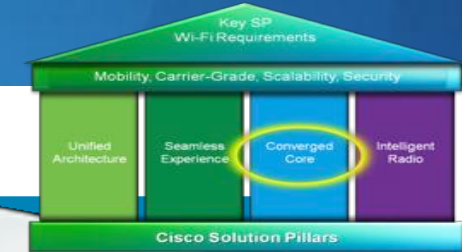
RELIABLE
Carrier class solution

SEAMLESS
Simplifies network discovery and selection for seamless cellular data offload

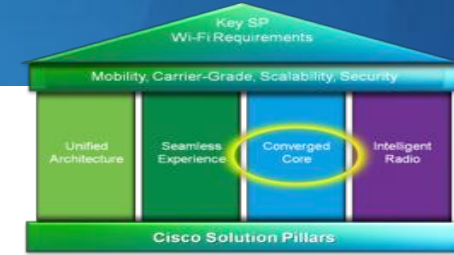
SECURE
Extends existing SIM-based authentication techniques over encrypted Wi-Fi

PROFITABLE
Enables location-based and value-added services

One Unified SP Wi-Fi Architecture



SP Wifi and Mobile Interworking Models



Untrusted Access

IWLAN, S2b

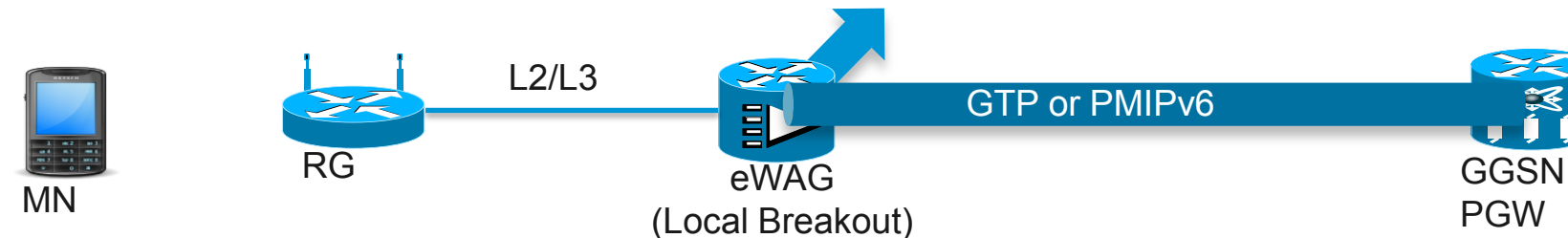
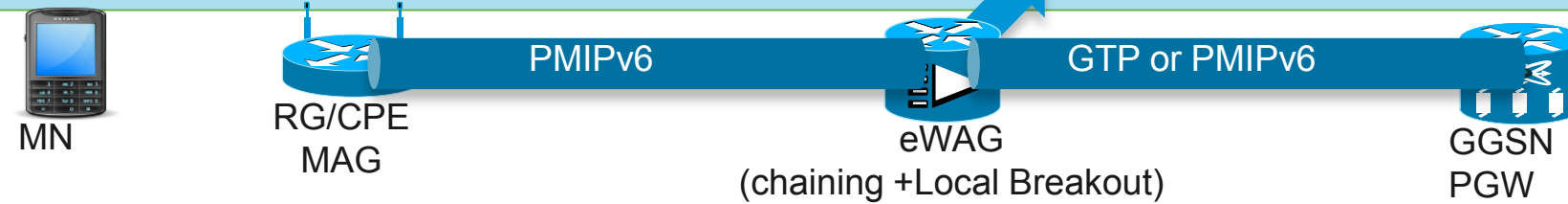
S2c



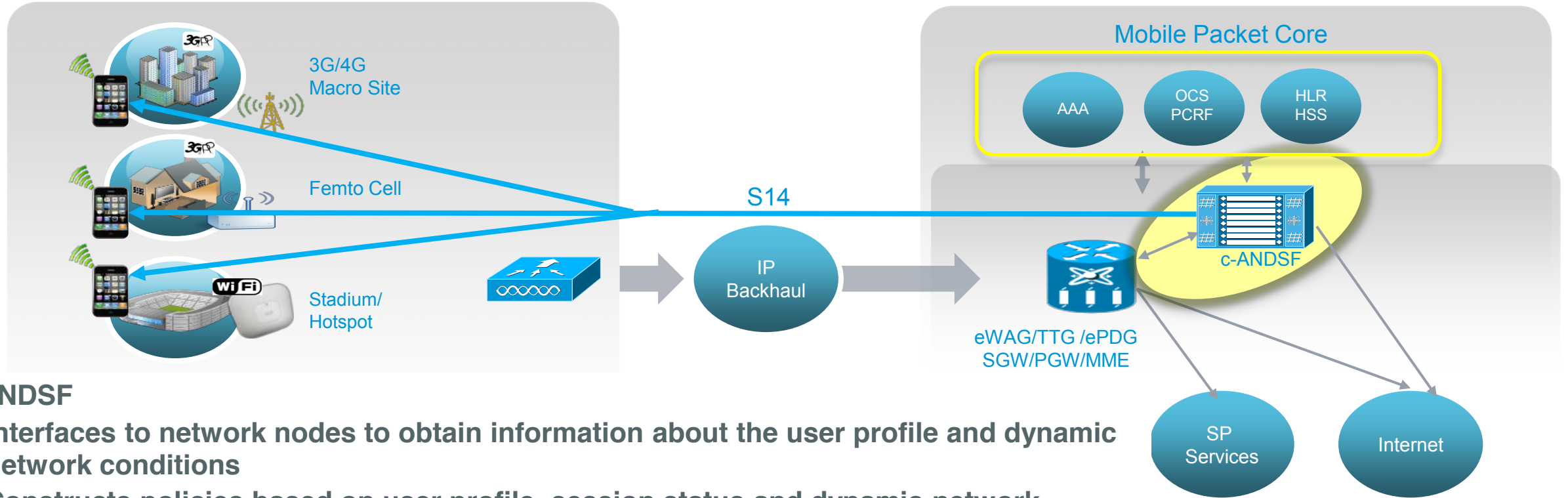
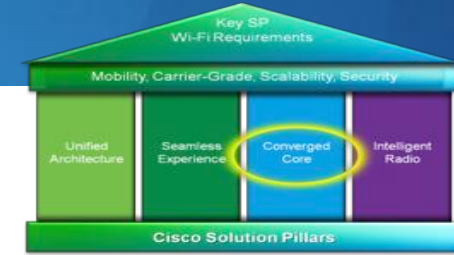
Trusted Access

S2a Overlay

S2a Infra-Based



Cisco Access Policy Control (c-ANDSF)



c-ANDSF

- Interfaces to network nodes to obtain information about the user profile and dynamic network conditions
- Constructs policies based on user profile, session status and dynamic network updates
- Dynamically pushes policy updates based on network triggers.
- Bi-directional S14 interface
- c-ANDSF receives data from the device and distributes it accordingly.
- Implements optimized transport on S14 interface

Wi-Fi Complements Mobile Services Enhancing Speeds & User Experience



- Focus on coverage
- City or country-wide
- Voice & basic data



- Provide spot capacity
- High-density areas
- Video & High-speed data

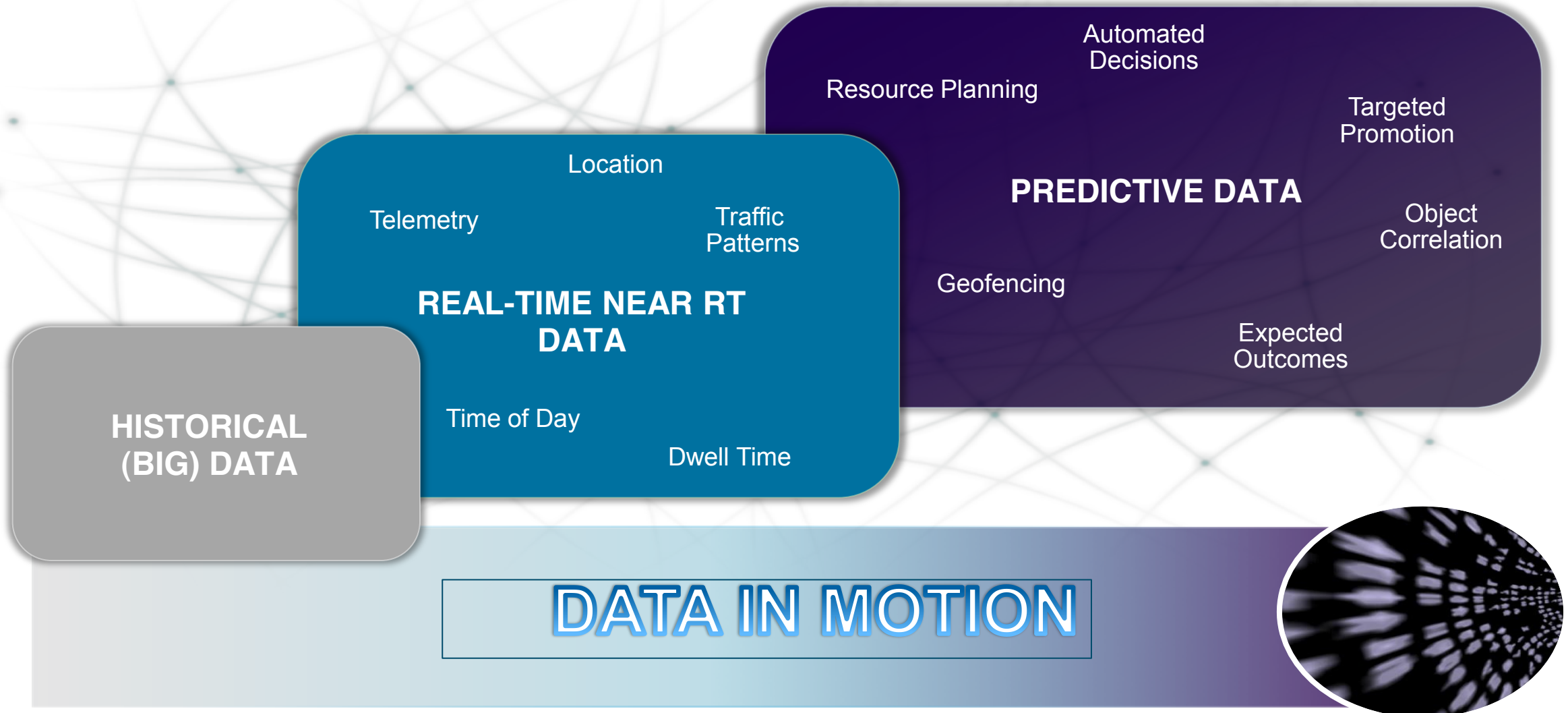


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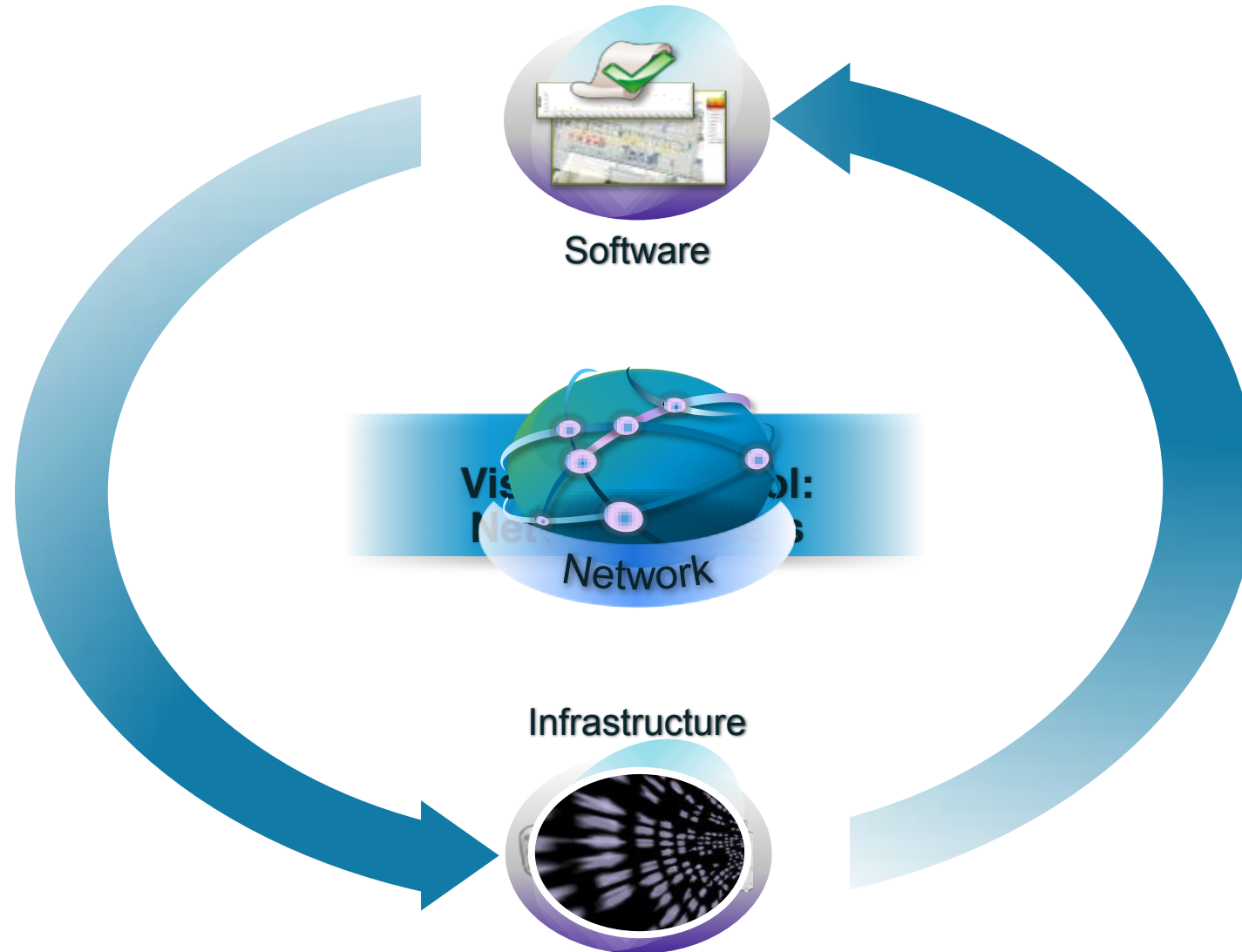
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Data-in-Motion: Greater Monetization, Optimization

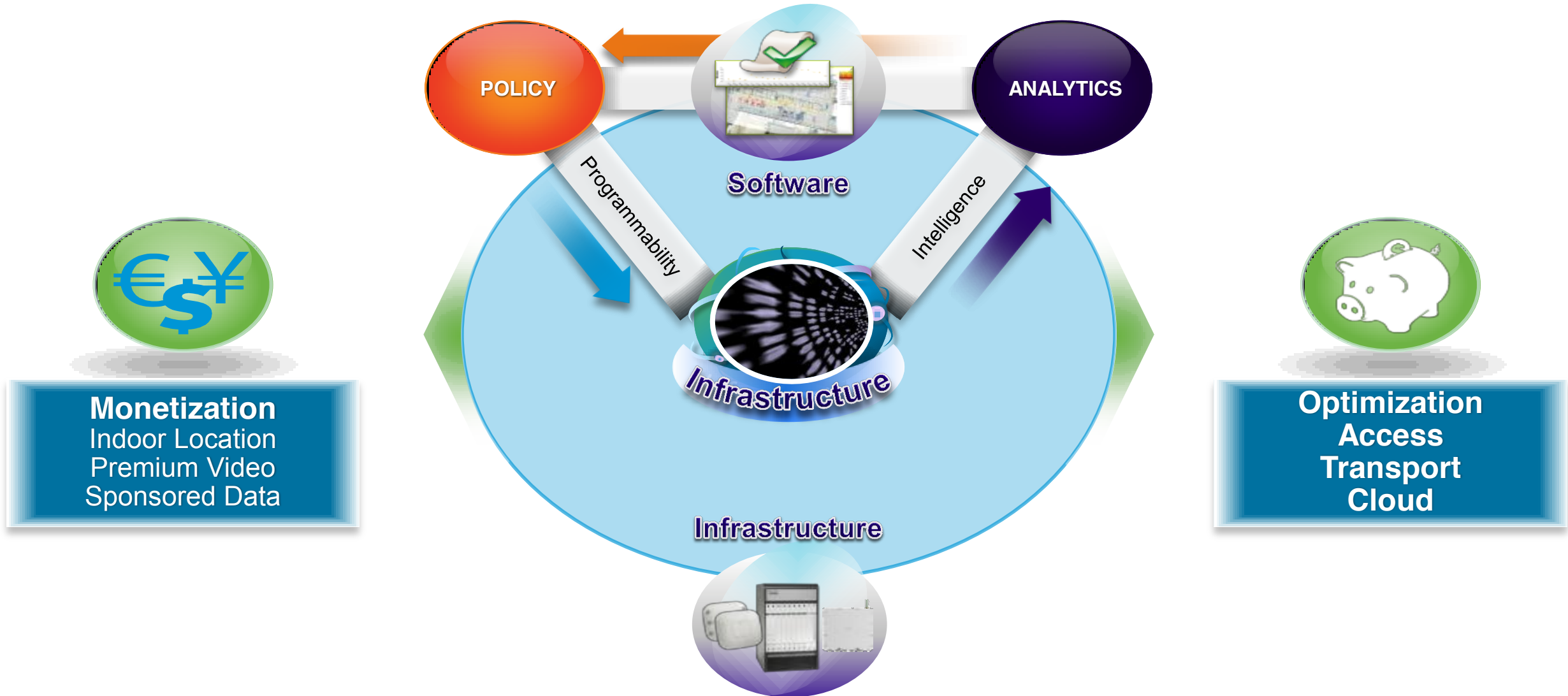
Intrinsic to SP Network



Elastic, Intelligent Network Foundational to Capturing Opportunity



Open, Programmable Framework Monetizes, Optimizes



Cisco Mobility Portfolio Innovations



Access

Licensed Small Cells
Small Cell Backhaul



Transport

Automatic network selection
Trusted, untrusted access security



Software

Cisco Quantum™*

Cisco Mobility

NEW

Address
Spectrum
Scarcity

NEW

Managing
Traffic
Growth

NEW

Monetize
and
Differentiate

Introducing Cisco Quantum™

Quantum Network Abstraction Suite

extracts and harvests intelligence from the network

Quantum Policy Suite

programs network for customized user experiences

Quantum Analytics Suite

real-time analytics including location

Quantum RAN Optimization Suite

SON for Mobile

Quantum WAN Orchestration Suite

SON for IP/MPLS



Optimizing the Experience in High-Density Venues

Quantum
NW Abstraction
Suite



Quantum
Analytics
Suite



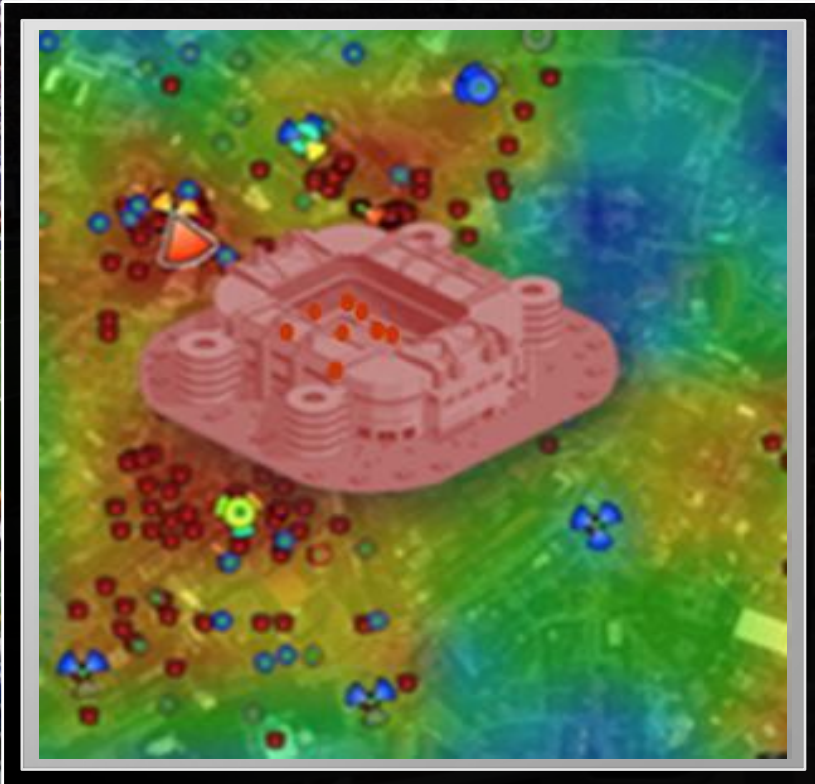
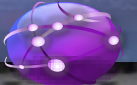
3G Small Cell
for Aironet



RAN Optimization
Suite



WAN Orchestration
Suite



Monetizing Indoor Premium Experience

Quantum
NW Abstraction
Suite



MSE with ThinkSmart
Analytics



Cisco ANDSF

Quantum
Policy
Suite

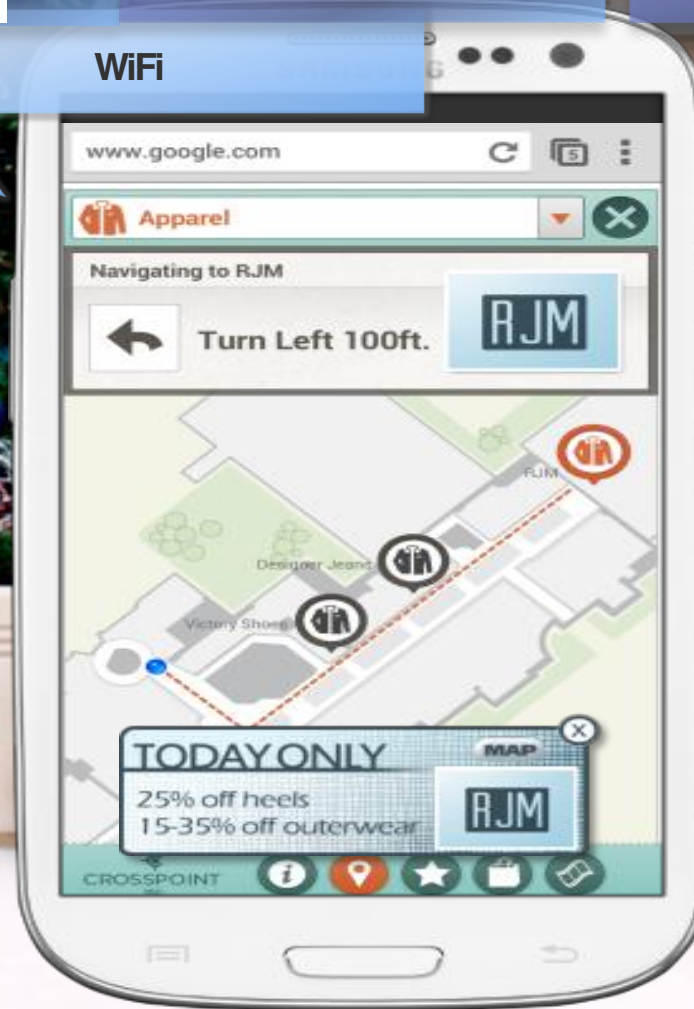


3G Small Cell Module w/ Passpoint



EARTHCOM

WiFi



Monetizing Seamless User Experience

Quantum
NW Abstraction
Suite



Quantum
Analytics
Suite



Quantum
Policy
Suite



New York City, NY
40.773639N, -73.95992W

Device iPad 4 **Connection** LTE

CONNECTION SPEED
12.67 Mbps

DATA QUOTA BALANCE
1.95 Gb

MOBILE USAGE ANALYTICS

Web: Fashion, Lifestyle, Fitness, Film

Apps: Yelp, Facebook, Twitter, IMDB, MyFitnessPal

Industry Voices on Cisco Mobility



Gabriel Brown, Senior Analyst

“Software tools that automate the process of abstracting and analyzing performance and service quality information are critical to operators that want to make real-time, and near real-time, decisions on network optimization and service delivery. The software layer is emerging as decisive to the operator’s ability to both scale and monetize the network.”



Peter Jarich, Vice President, Consumer and Infrastructure

“We’ve moved past the stage where small cells can be either licensed or unlicensed; operators need both sets of technologies. At the same time, we’ve moved past the stage where architecture (small cell vs. macro cell) trumps the need for service intelligence backed by a solid focus on software. Cisco’s proven that it understands these dynamics.”

Key take away

- ✓ Mobile data is in the rise
- ✓ Largest source of mobile data will be Smartphones
- ✓ Carrier Grade WiFi network is required to deliver Carrier Grade WiFi Services
- ✓ Small Cells deployments (licensed & unlicensed) complements Mobile macro network
- ✓ Data in motion is paradigm for seamless integration of all access technologies
- ✓ Intelligent network delivered by an elastic and programmable mobile architecture is required to capitalize on Data in Motion
- ✓ Cisco is introducing an evolution of its Next Gen Internet Architecture to help Service Providers expand new business opportunities using Data In Motion

Thank you.

