Cisco Canada Plus

Mobile Video Optimization and Delivery

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Sr. Mobile Solutions Marketing Mgr.

cisco

Remember When …..

Your telephone was just a telephone?

Phone Company – only game in town

Problem – I must have misdialed, my mistake?

Our TV was just a TV?

Cable / IPTV / Satellite – were the main providers

Problem – Change providers

And now

My TV is my PC

My Tablet is my TV

And my Phone is my TV Remote

Landline Phone $30 Month

Cable / IPTV ~ $40 per month

TV~ $80 per month

So What Do Mobile Users Want?

Mobile Network Quality

- 65% want consistent performance
- 56% want uninterrupted service / dropped calls
- 47% want consistent speed
- 44% want higher speeds for browsing, downloads, movies
- 36% want National Coverage
- 27% want speedy network repairs
- 13% want Global Coverage

Mobile Video Viewers

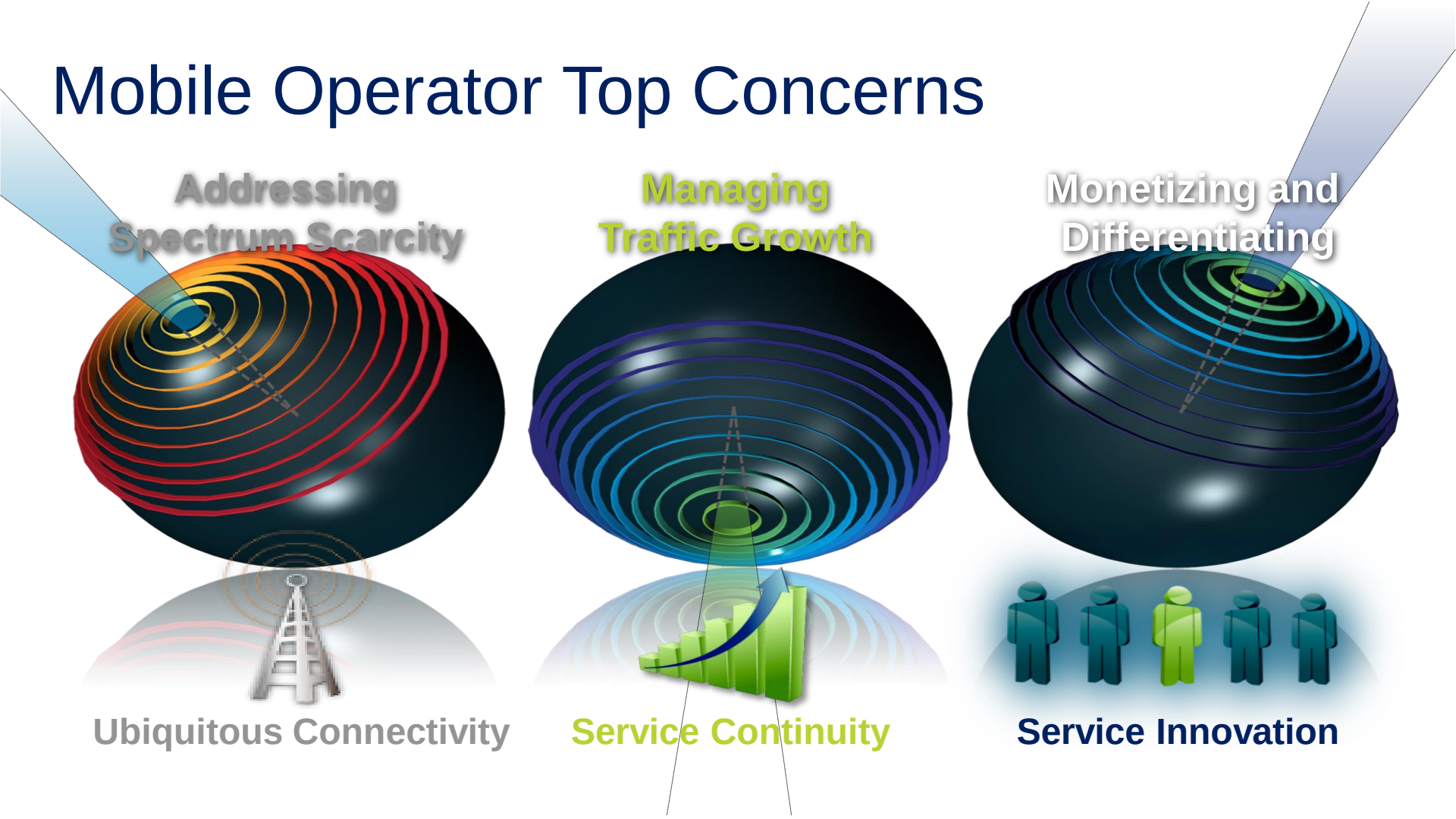
- 10 seconds: 20% of viewers abandon a video that doesn't hold their attention
- 30 seconds into an online video as many as third of viewers have moved on
- 1 minute 44% have left
- 2 minutes almost 60% have gone

What Mobile Users Expect

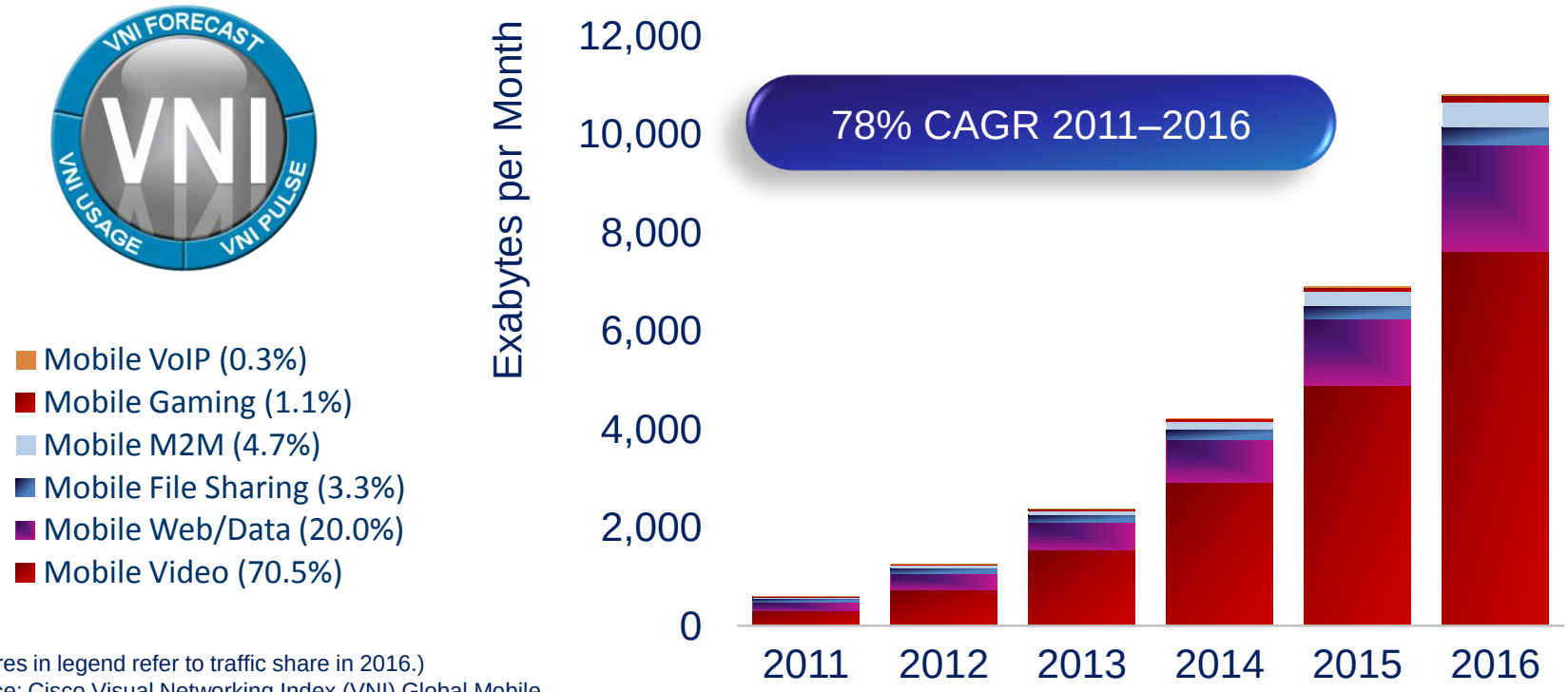
- 71% of Mobile Users expect data for websites to load as fast on their Mobiles as on their PC's – Broadband
- 43% of Mobile Users are unlikely to return to a website that loads slowly.

Sources: Cisco, Heavy Reading Yankee Group, Compuware

Mobile Operator Top Concerns



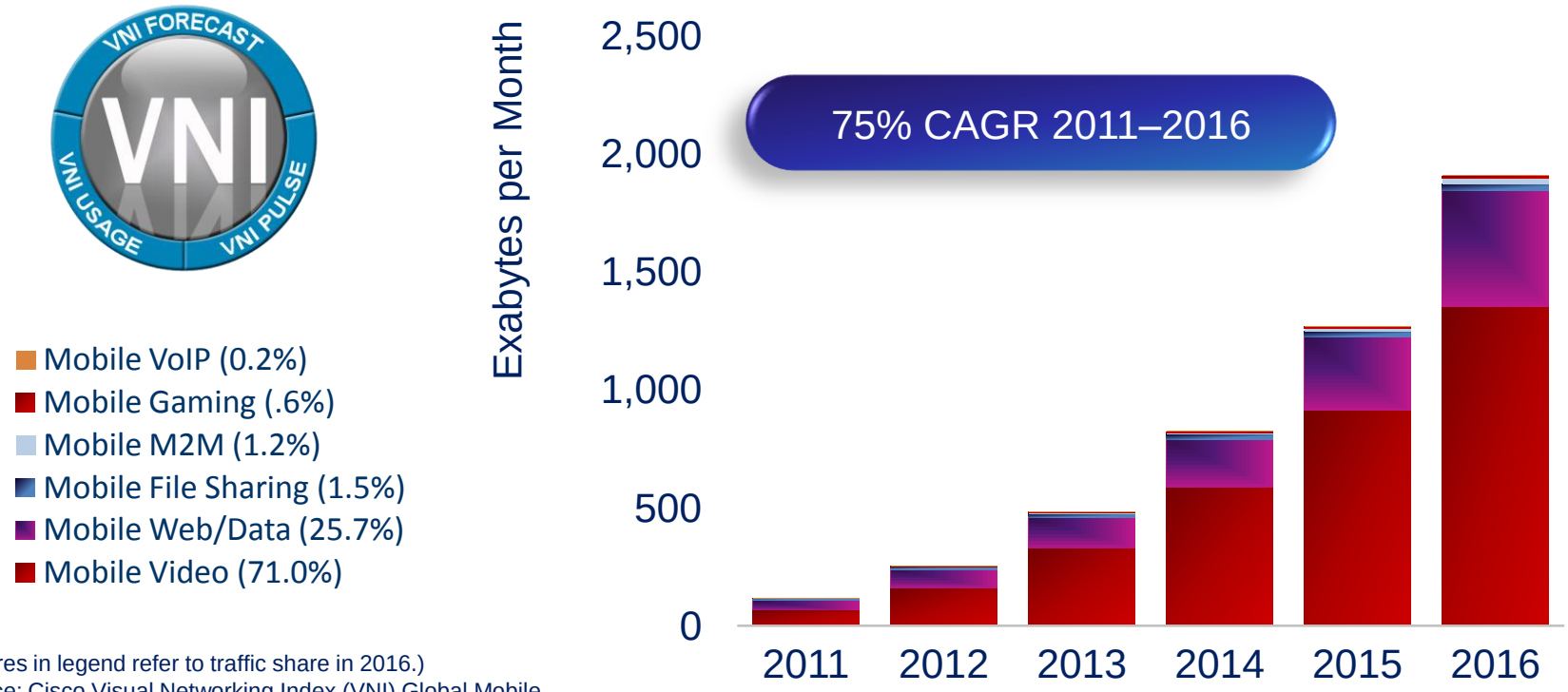
Video Exceeds **70%** of Mobile Data Traffic by 2016



(Figures in legend refer to traffic share in 2016.)
Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2011–2016

NA Mobile Data Traffic Growth / Apps

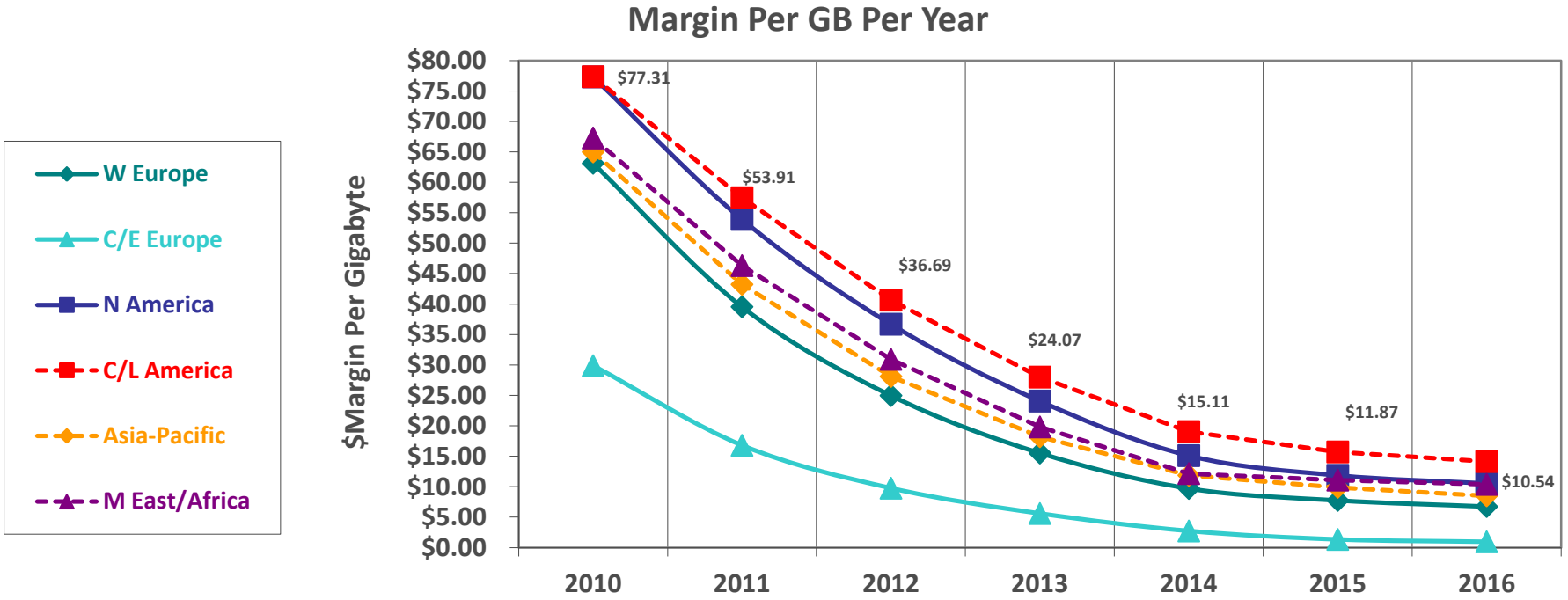
Video to reach 71 Percent of Mobile Data Traffic in 2016



(Figures in legend refer to traffic share in 2016.)
Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2011–2016

$ Margin Per GB Per Year Declines Dramatically

Rate of Margin Per GB decline Slows as Traffic Growth decreases

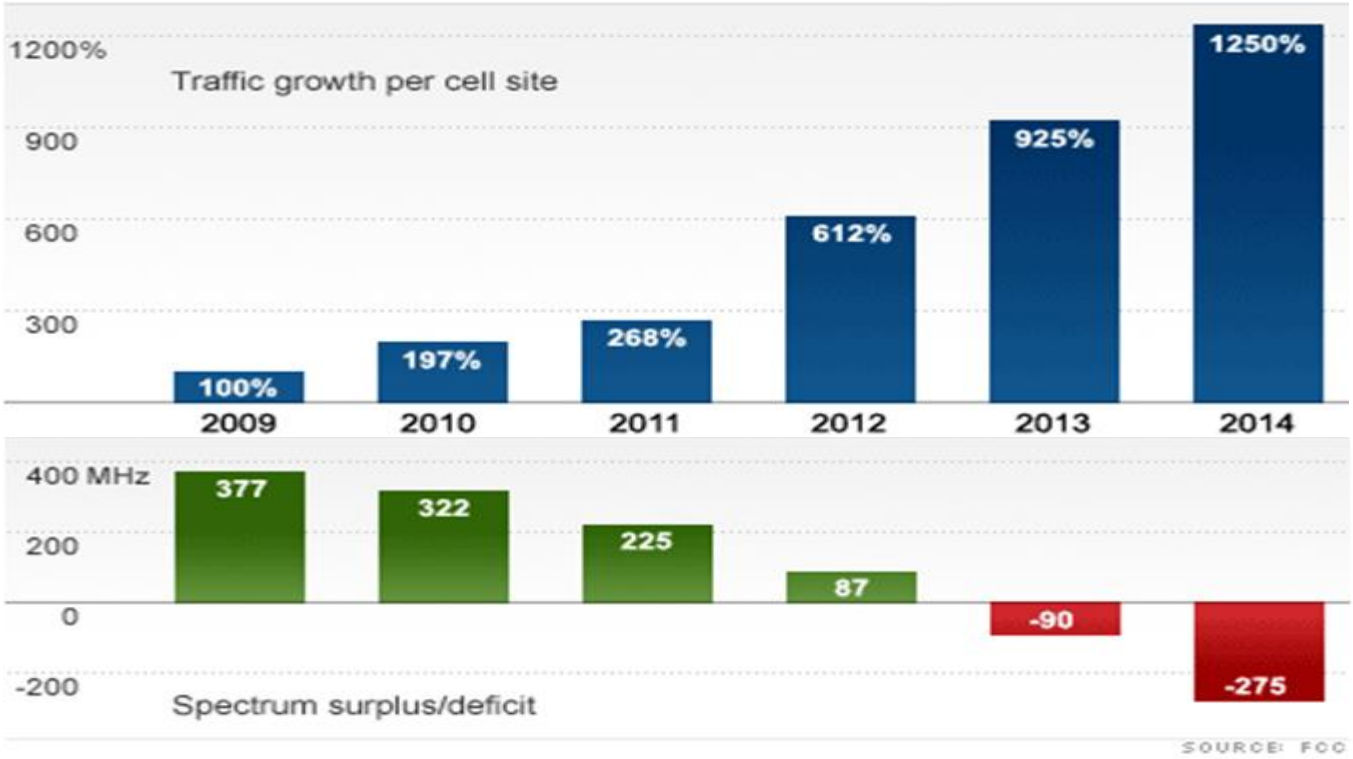


Margins per GB decline slower as Traffic growth slows - indicating that price increases that would slow Traffic growth could significantly improve margins

Source November, 2011 Strategy Analytics

Wireless Data Growth

Leads to Spectrum Deficit



Mobile Video Ecosystem

Consumer Behavior Fragmented

Video = 71% of all Mobility traffic by 2016

Netflix = 29% of US downstream peak internet traffic

Online Video Snacking 11.4 Hour /month

Discrete Content on Discrete Devices

Broadcasters and Media Going Direct

New interactive content – Sky Sport TV on iPad / RTL on iPhone and iPad

Offering wider content choice on-demand

Pressure to adapt content for multiple screens and cost-efficient delivery

Business Models Diverging

CE companies pursuing IP Video

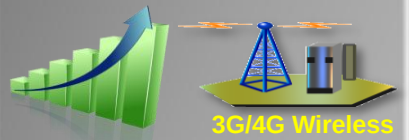
10B Mobile devices projected by 2016

Building application and content eco-systems

New Streaming Services from non-Traditional Players

Service Providers Colliding

Multiple-screen offering becoming table stakes



Rising CAPEX to support OTT Video, limited revenue upside

Partnerships and Vertical Integration

Most Users Will be in the GigaByte Club

92 MB
Traffic/month

- 3 Video Clips
- 5 Audio tracks
- 1 Video call
- 5 App Downloads

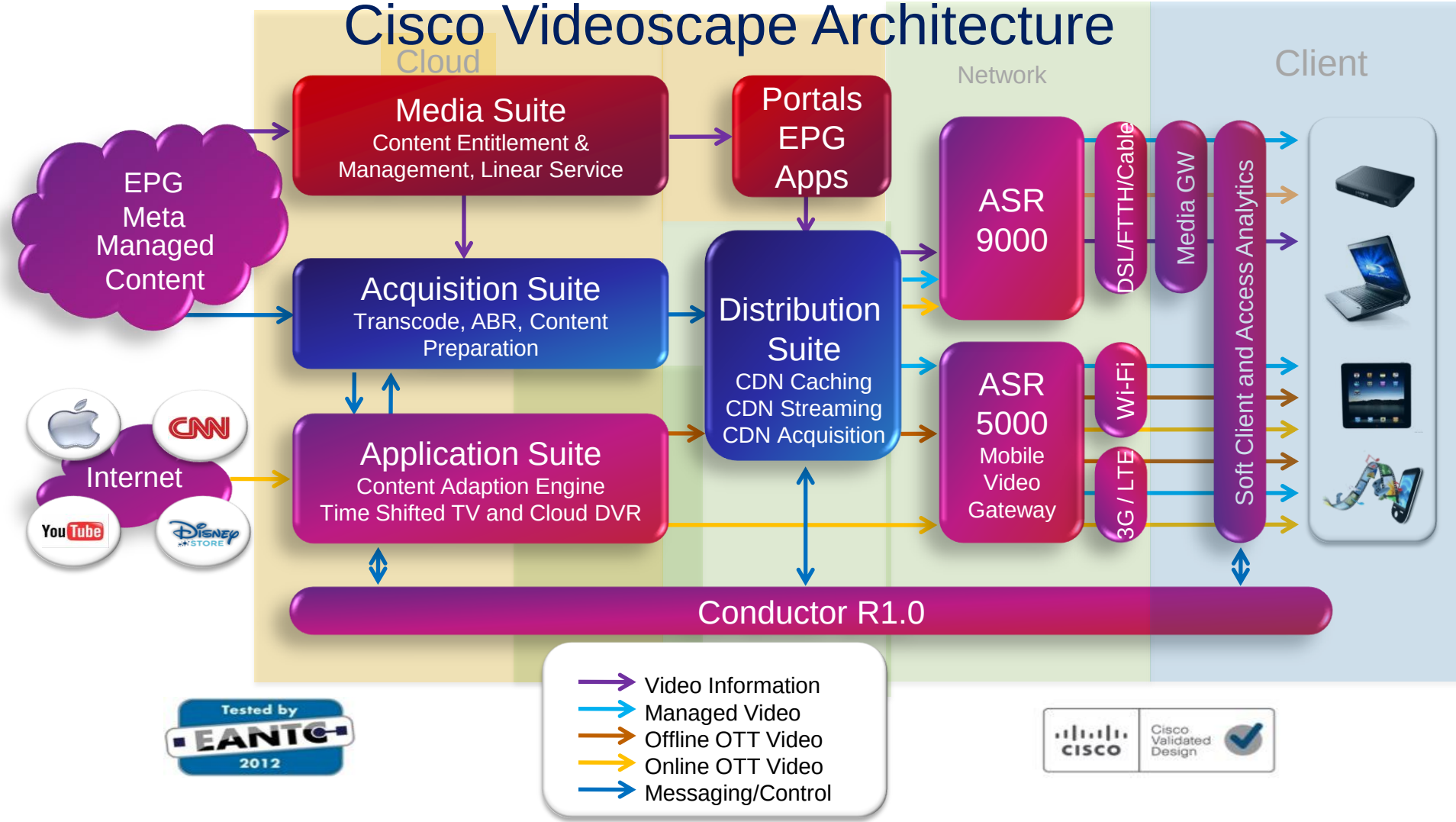
1.2 GB
Traffic/month

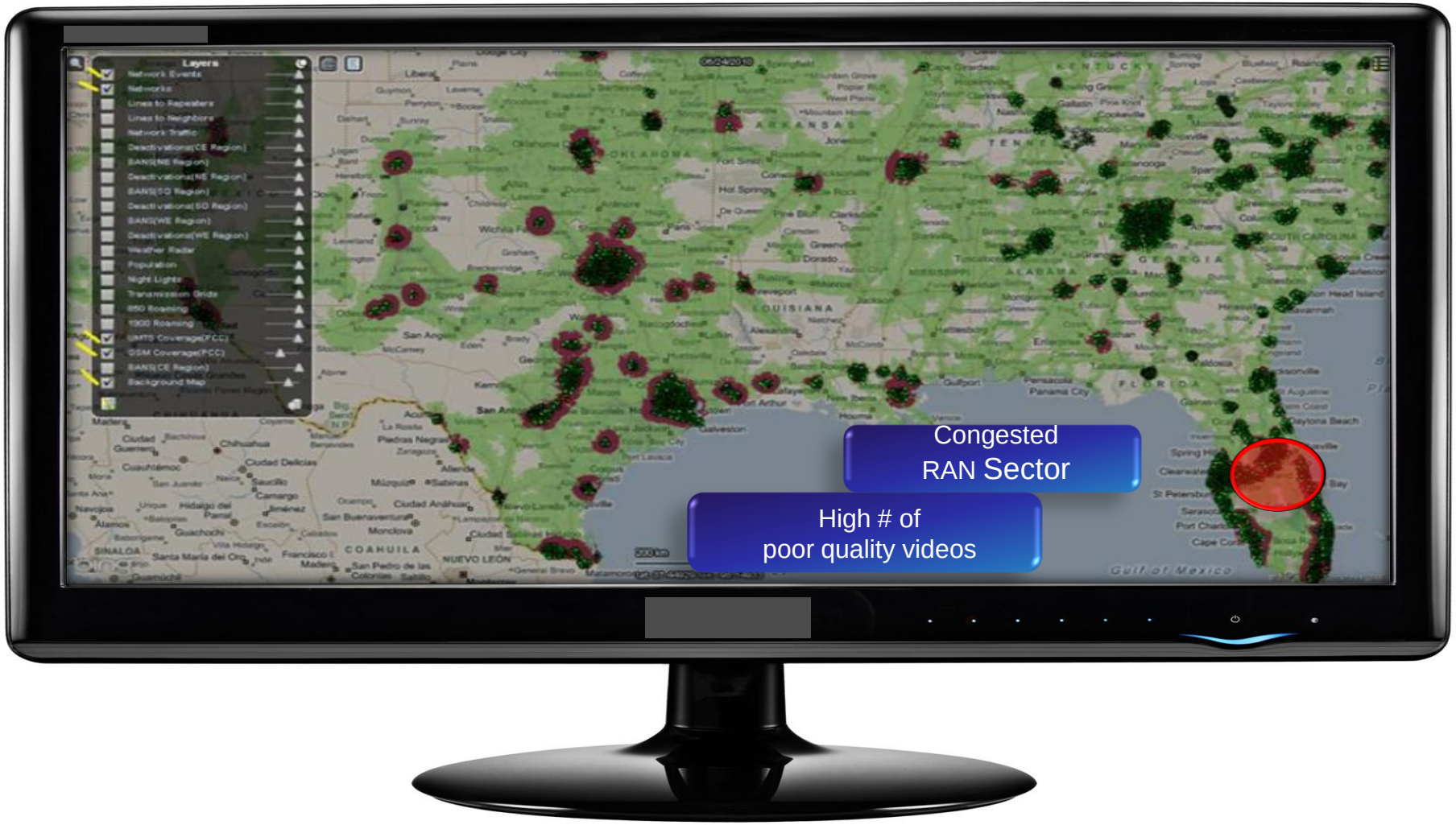
- 10 Video Clips
- 5 Videos
- 50 Audio tracks
- 3 Video calls
- 10 App Downloads

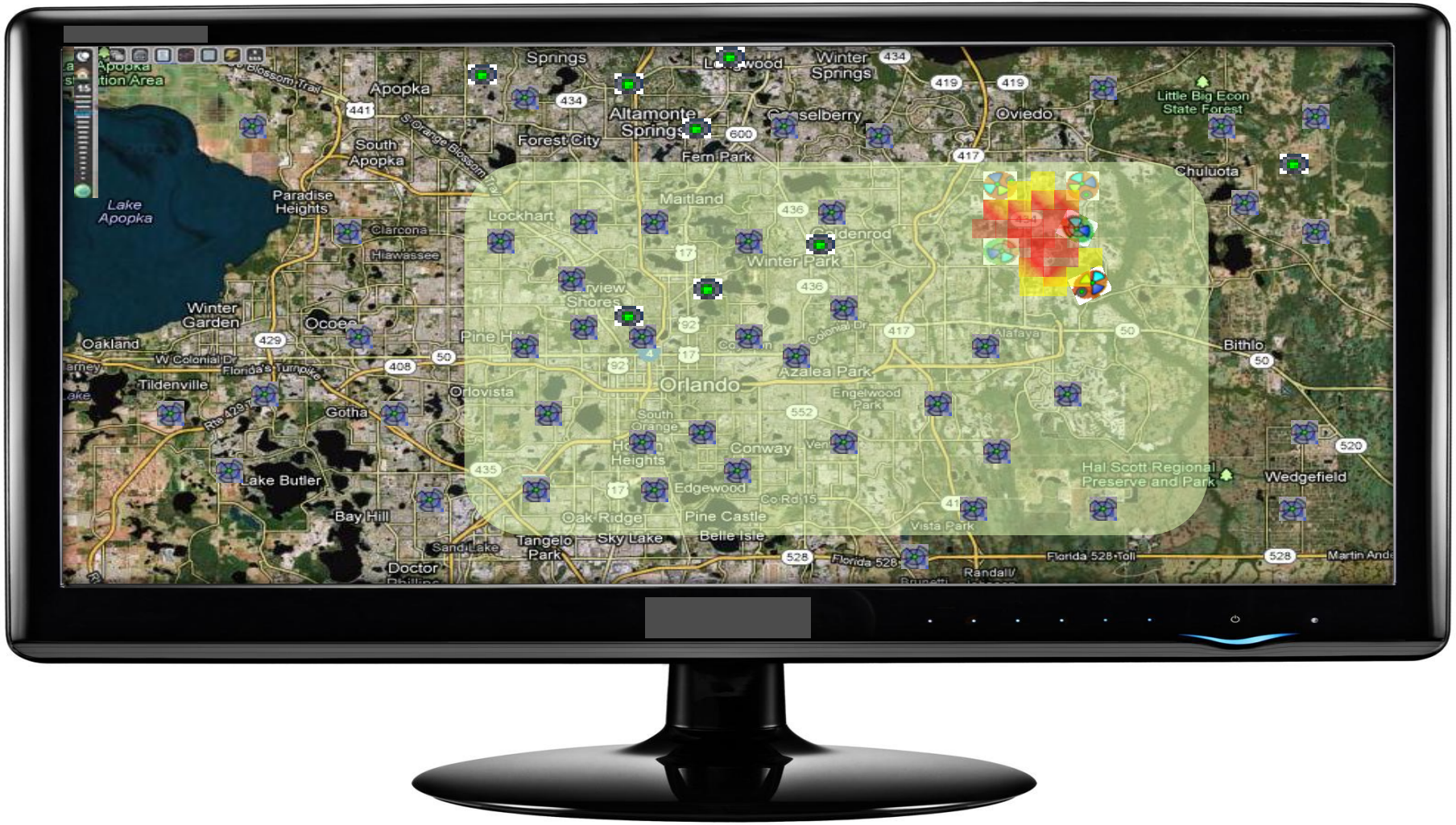
By 2016, **60 percent** of mobile users (3 billion people) will belong to the ***Gigabyte Club***, generating more than one gigabyte of mobile data traffic per month.

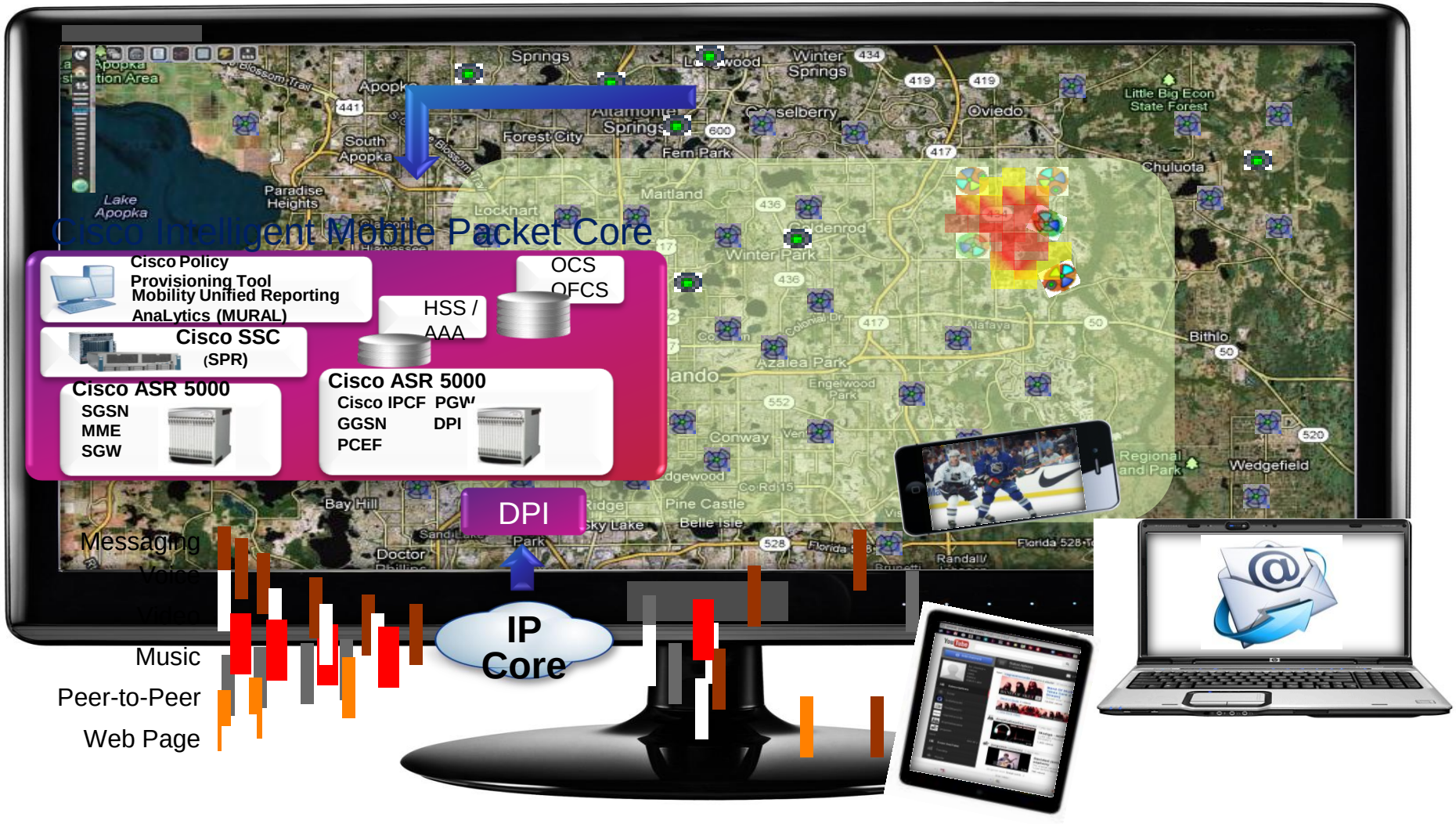
In 2011, **0.5** percent of mobile users belonged to the Gigabyte Club.

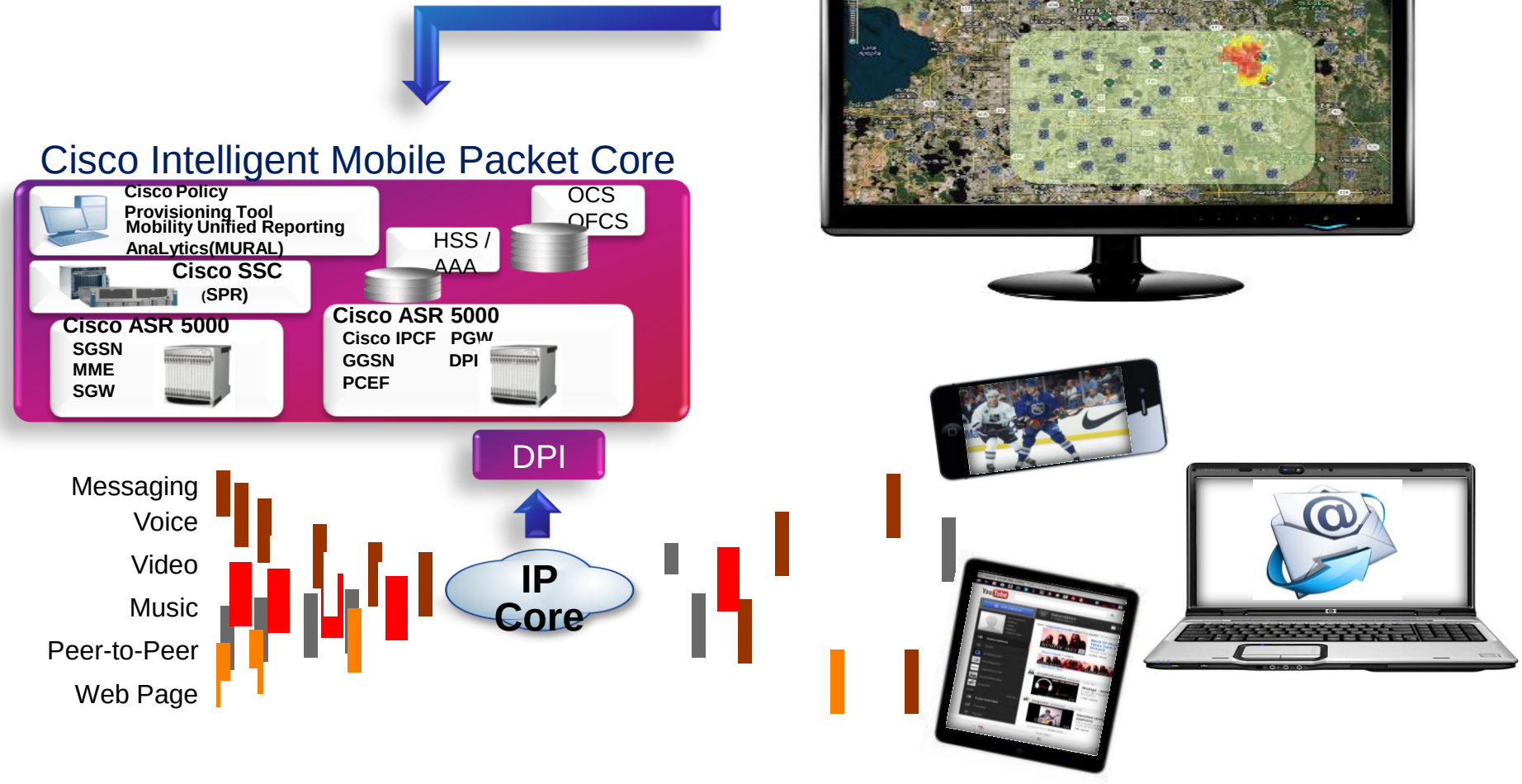
Cisco Videoscape Architecture




Layers
Network Events
Networks
Lines to Repeaters
Lines to Neighbors
Network Traffic
Deactivations(CE Region)
BANS(NE Region)
Deactivations(NE Region)
BANS(SO Region)
Deactivations(SO Region)
BANS(WE Region)
Deactivations(WE Region)
Weather Radar
Population
Night Lights
Transmission Grids
850 Roaming
1900 Roaming
UMTS Coverage(FCC)
GSM Coverage(FCC)
BANS(CE Region)
Background Map
Congested
RAN Sector
High # of
poor quality videos


Apopka
Springs
Winter Springs
Altamonte Springs
Forest City
Fern Park
Oviedo
Little Big Econ State Forest
Chuluota
Maitland
Lockhart
Winter Park
Paradise Heights
Lake Apopka
Clarcona
Hiawassee
Winter Garden
Ocoee
Oakland
Tildenville
Gotha
Orlovista
Pine Hills
Orlando
Azalea Park
Bithlo
Wedgefield
Conway
Edgewood
Lake Butler
Bay Hill
Oak Ridge
Pine Castle
Sky Lake
Belle Isle
Tangelo Park
Vista Park
Hal Scott Regional Preserve and Park
Florida 528
Florida 528 Toll
Doctor
Randall


Cisco Intelligent Mobile Packet Core
Cisco Policy
Provisioning Tool
Mobility Unified Reporting
AnaLytics (MURAL)
Cisco SSC
(SPR)
HSS /
AAA
OCS
OFCS
Cisco ASR 5000
SGSN
MME
SGW
Cisco ASR 5000
Cisco IPCF PGW
GGSN DPI
PCEF
DPI
IP
Core
Messaging
Voice
Video
Music
Peer-to-Peer
Web Page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AnaLytics(MURAL)
Cisco SSC
(SPR)
HSS /
AAA
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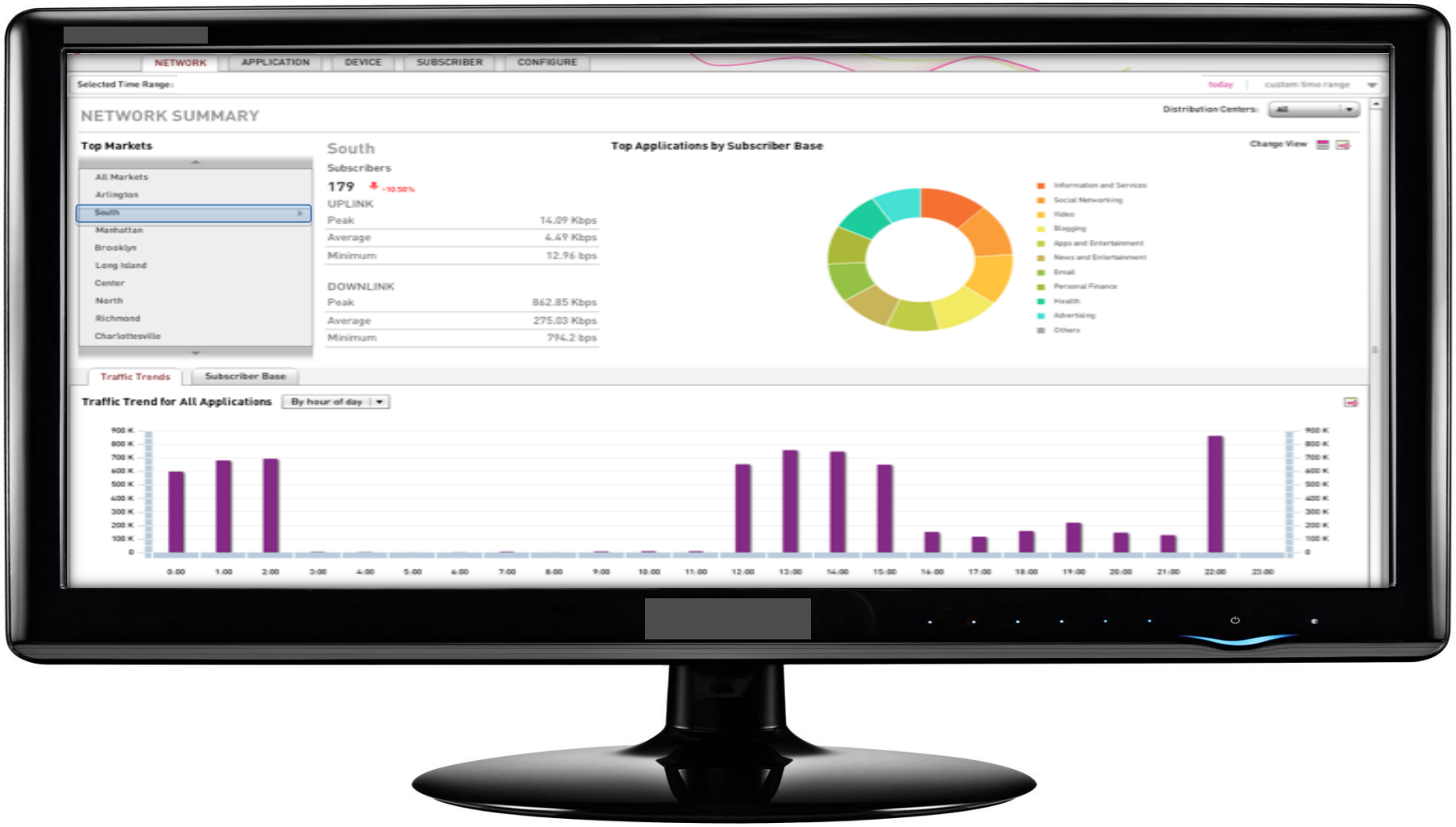
OFCS
Cisco ASR 5000
SGSN
MME
SGW
Cisco ASR 5000
Cisco IPCF
GGSN
PCEF
PGW
DPI
DPI
Messaging
Voice
Video
Music
Peer-to-Peer
Web Page
IP
Core


NETWORK
APPLICATION
DEVICE
SUBSCRIBER
CONFIGURE
Selected Time Range:
today
custom time range
NETWORK SUMMARY
Distribution Centers:
All
Top Markets
All Markets
Arlington
South
Manhattan
Brooklyn
Long Island
Center
North
Richmond
Charlottesville
South
Subscribers
179
-10.50%
UPLINK
Peak 14.09 Kbps
Average 4.49 Kbps
Minimum 12.96 bps
DOWNLINK
Peak 862.85 Kbps
Average 275.03 Kbps
Minimum 794.2 bps
Top Applications by Subscriber Base
Change View
Information and Services
Social Networking
Video
Blogging
Apps and Entertainment
News and Entertainment
Email
Personal Finance
Health
Advertising
Others
Traffic Trends
Subscriber Base
Traffic Trend for All Applications
By hour of day
900 K
800 K
700 K
600 K
500 K
400 K
300 K
200 K
100 K
0
0:00
1:00
2:00
3:00
4:00
5:00
6:00
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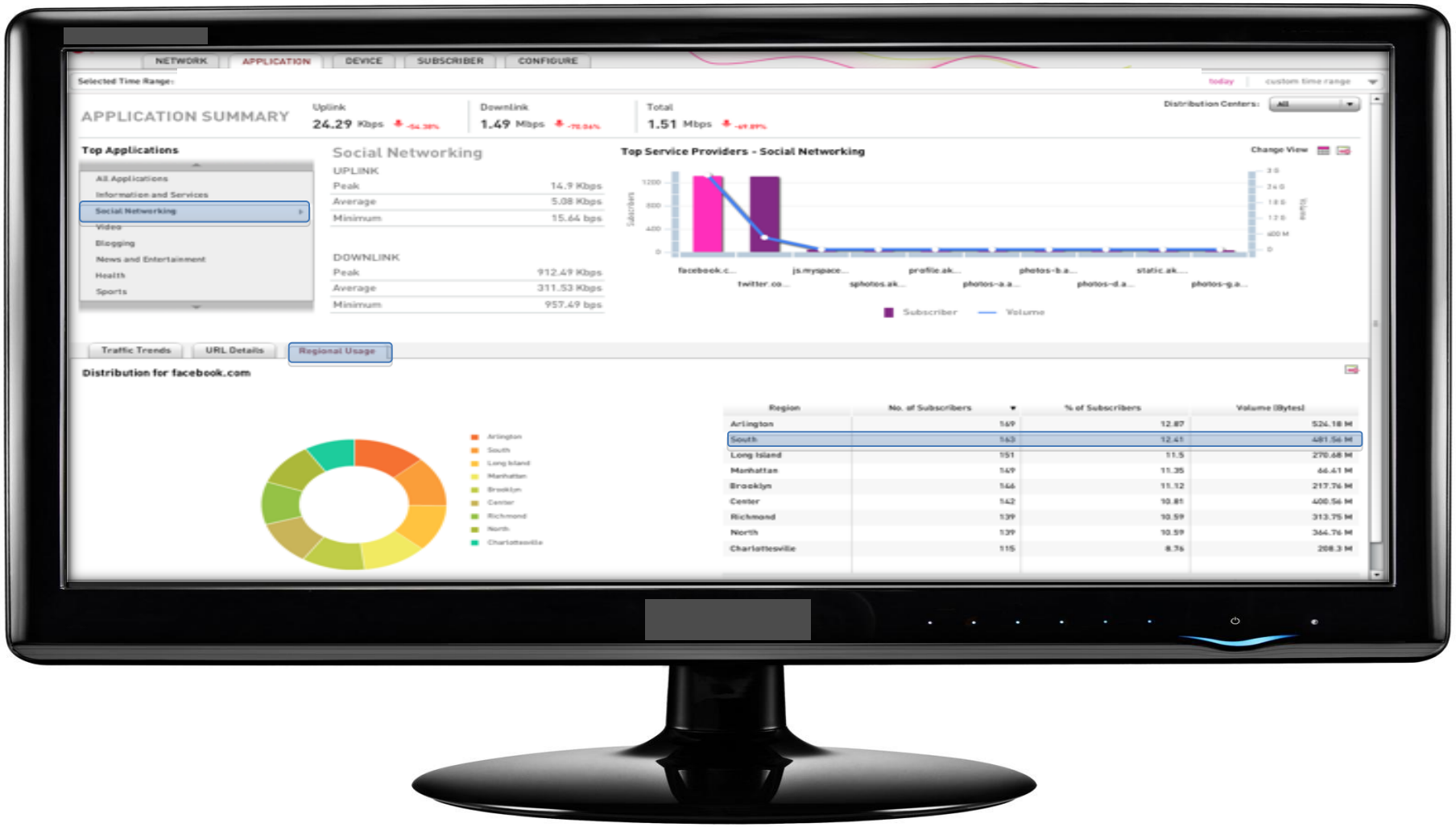
NETWORK
APPLICATION
DEVICE
SUBSCRIBER
CONFIGURE
Selected Time Range:
today
custom time range
APPLICATION SUMMARY
Uplink
24.29 Kbps
Downlink
1.49 Mbps
Total
1.51 Mbps
Distribution Centers:
All
Top Applications
All Applications
Information and Services
Social Networking
Video
Blogging
News and Entertainment
Health
Sports
Social Networking
UPLINK
Peak 14.9 Kbps
Average 5.08 Kbps
Minimum 15.64 bps
DOWNLINK
Peak 912.49 Kbps
Average 311.53 Kbps
Minimum 957.49 bps
Top Service Providers - Social Networking
Change View
Subscriber
Volume
Traffic Trends
URL Details
Regional Usage
Distribution for facebook.com
Region
No. of Subscribers
% of Subscribers
Volume (Bytes)
Arlington 169 12.87 524.18 M
South 163 12.41 481.56 M
Long Island 151 11.5 270.68 M
Manhattan 149 11.35 66.41 M
Brooklyn 146 11.12 217.76 M
Center 142 10.81 400.56 M
Richmond 139 10.59 313.75 M
North 139 10.59 364.76 M
Charlottesville 115 8.76 208.3 M

Cisco Intelligent Mobile Packet Core

Cisco Policy Provisioning Tool
Mobility Unified Reporting Analytics (MURAL)
Cisco SSC (SPR)
HSS / AAA
OCS OFCS
Cisco Content Adaption Engine (CAE)
Cisco ASR 5000
SGSN SGW MME
Cisco IPCF PGW
GGSN DPI
PCEF

DPI

Messaging
Voice
Video
Music
Peer-to-Peer
Web Page

IP Core

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DPI

Messaging
Voice
Video
Music
Peer-to-Peer
Web Page

IP Core


Usage per Tier
+ Platinum
+ Video Service
- Gold
Voice Services
Social Media
Non-carrier VoIP
Streaming
Gaming
email
Web
Tunnel
+ Silver
Preview
Profiles
Schedule
Immediate
Carrier-defined Profiles
Level 1 Overuse
• Cap Social Media 3Gbps
Level 2 Overuse
• Cap Gaming
• Adjust Video Transcoding
• Apply Level 1
Emergency Services Priority
• Block P2P All
Save as New Profile
9:25 AM
4/3/2011


Usage per Tier
+ Platinum
+ Video Service
- Gold
Voice Services
Social Media
Non-carrier VoIP
Streaming
Gaming
email
Web
Tunnel
+ Silver
Preview
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Save as New Profile
9:25 AM
4/3/2011

Mobile Video Optimization
No One Single Solution Is A “Silver Bullet”

- Optimization solutions for Internet web browsing and video streaming
- Policy management solutions to apply policy and charging rules
- Content Delivery Networks (CDNs) to cache and optimize content
- DPI-enabled bandwidth management solutions
- Offloading solutions
- Client-based optimization solutions with software on the mobile device
- Network probes and software analytics for the Radio Access Network (RAN) and the core network
- Protocol analyzers and transport optimization hardware
- Data Aggregation and Analysis

Source: ABI Research 2011

Mobile Video Services

New Revenues from Video Content Partnerships

What's the Opportunity?

- Forge partnerships with video content providers for high quality internet video streaming experience

What are the Benefits?

- Sell premium video services with partners' video content services
- Upsell higher Data Tiers to support increased video consumption
- Manage video bandwidth impact

Leverage popularity of select OTT video content for win-win new services revenues

So Which Would You Prefer?

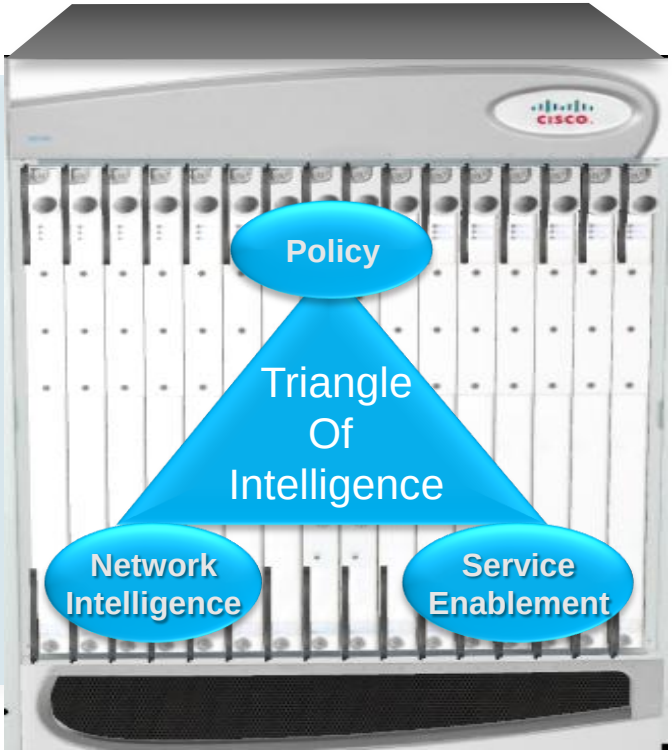
Upgrade quality for $.99?

Quality upgraded

Mobile Policy

"The policy engine is the brains of how you want the network to treat different things at different times. It's essential. "

Tony Melone
CTO of Verizon Communications
March 16, 2011



Source: Fierce Wireless, March 16, 2011

Tiered Plans

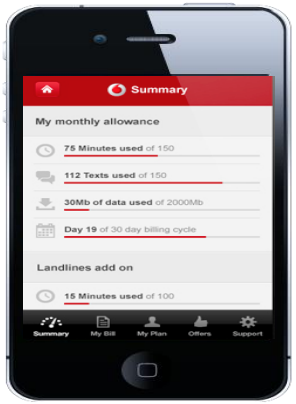
Gain New Subscribers & Optimize Bandwidth

What's the Opportunity?

- Offer plans at varying usage quotas and speed tiers

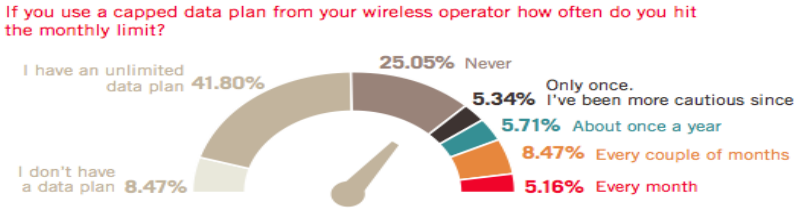
What are the Benefits?

- Drive ARPU with new pricing
- Attract wider range of users
- Up-sell higher tiers to top users



Subscriber conditioning important in shift to Usage-Based Pricing

Users are becoming more data quota aware



Source: *2012 Mobile Life Survey,* Light Reading

Tiered Services: Speed Tiers with Video

The Sports Fan

The Business User

The Casual User

Gold Tier (Policy)
Up to 1 MBPS
$25/Month

Silver Tier (Policy)
Up to 512 KBPS
$20/Month

Bronze Tier (Policy) Up to
256 KBPS $15/Month

Original Video
1.5 MBPS

It's not Just About Offload: Transforming Experience & Growing Revenues

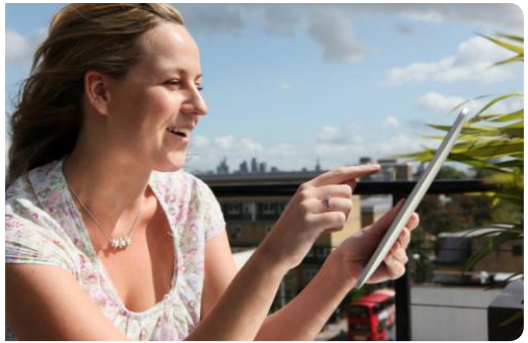
Wi-Fi as a hotspot technology: a wireline service

Wi-Fi as a mobile offload technology: a cellular network optimization tool

2009 2010 2011 2012

Wi-Fi as a platform for:

- Service innovation
- Revenue growth
- Experience transformation



Mobile Offload & Service Bundling Generate Significant Internal Value

Bundled Wi-Fi

Bundling Wi-Fi service to another service

Example: mobile data package, broadband

Typically free of charge

Reduced customer churn

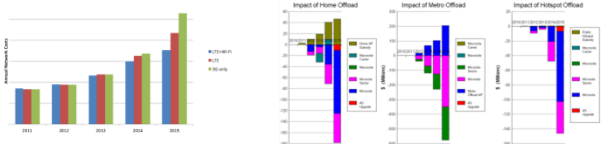
Increased market share for core services through differentiation

Offload mobile data traffic using Wi-Fi

Serve huge growth in mobile data traffic

Reduce 3G/4G CapEx and operating costs

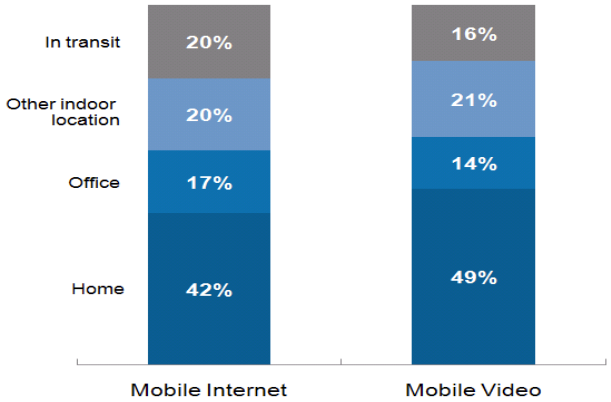
Estimated savings: $3 - $5 /GB



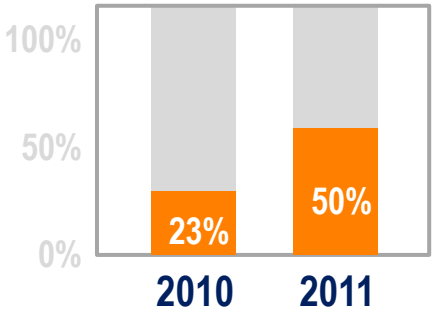
Wi-Fi is an Important User-Driven Trend

80% of the time users are within Wi-Fi coverage

Mostly **nomadic** use



50% of smartphone usage is already on Wi-Fi



19 out of **20** smartphones support Wi-Fi

Sources: Cisco Visual Networking Index, 2011; Bango Inc., February 2011; North Carolina State Univesity, Cisco IBSG 2011

Ad Supported Video Promotions with Cisco SP Wi-Fi Solution

What's the Opportunity?

- LBS and Ad Supported Video

What are the Benefits?

- Reduced traffic on 3G / 4G RAN
- Create LBS & Advertising Models

Users are becoming more data quota aware: supply reduce cost options

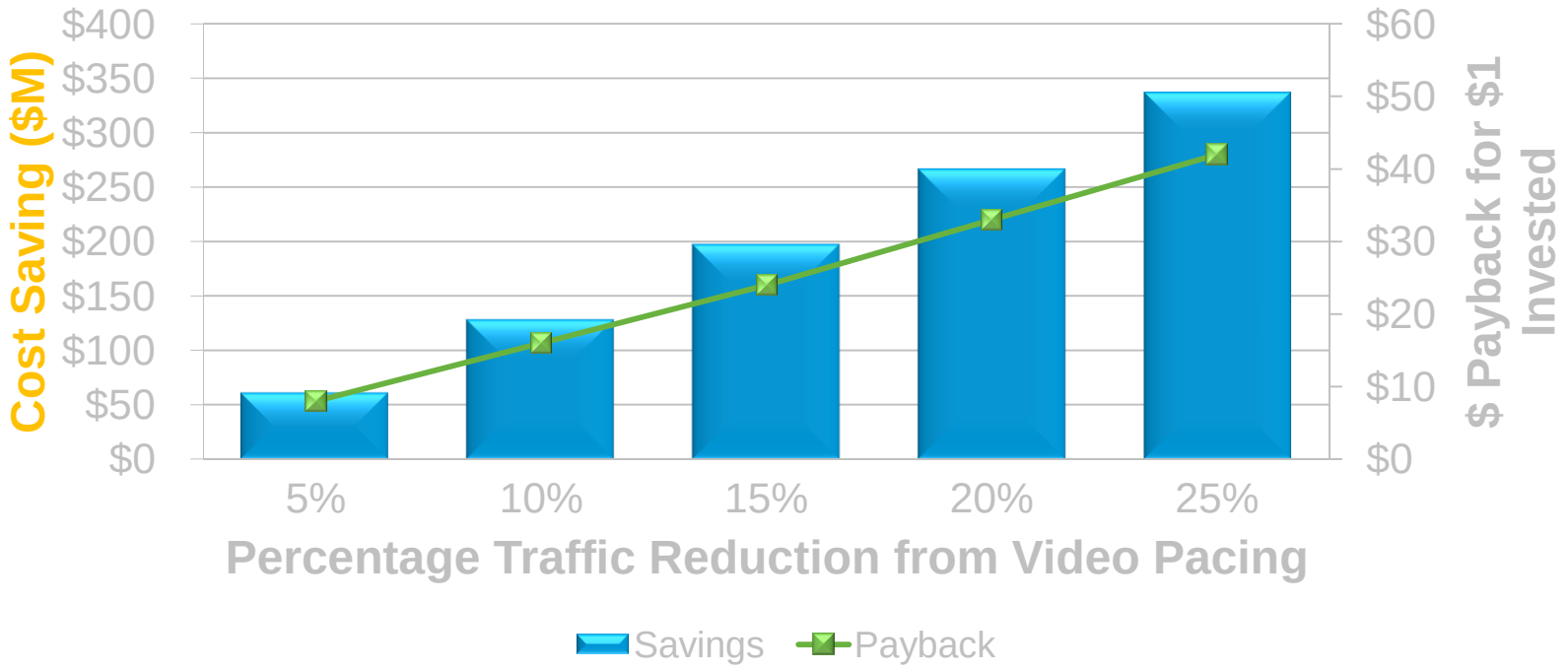
Optimization Savings Analysis

Medium Sized Operator

- Subscribers
  - Total: 15M growing to 18M+
  - Data: 5M growing to 14M
  - Video: 1.8M growing to 5.3M
- Traffic
  - Total: 1.3M to over 35M TB/mo
  - Video: 0.6M to over 24M TB/mo (67% of data)
  - 150 MB/month per sub
- Network dimensions
  - Models 3G and 4G radios
  - 2000 cell sites (5% growth)
  - 400 pre-aggregation sites
  - 25 aggregation sites
  - “Urban” cell sites (20%) carry 40% traffic with GE backhaul
  - “Non-urban” cell sites carry 60% traffic with T1 backhaul
  - Network transport variable
  - All packet core elements modeled

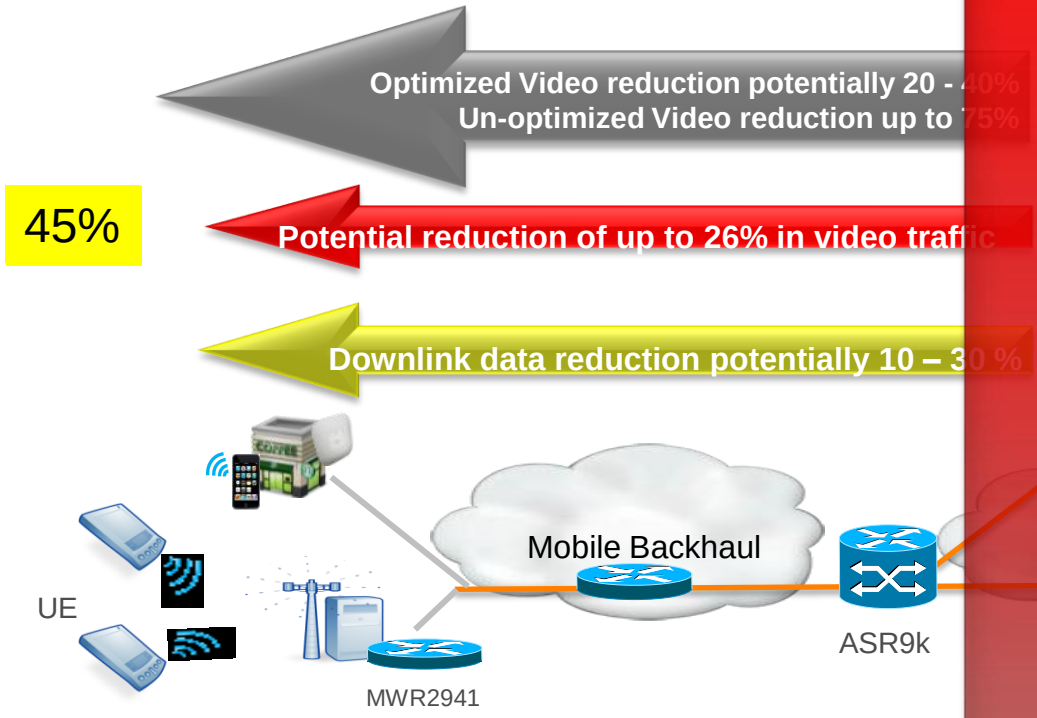
Video Pacing Analysis

15M Subscriber Network



Traffic Packet & Video Optimization

Offload, Video Pacing, Optimization



Why Cisco Optimization?

- Lower radio costs
- Increase network capacity
- Enhance customer experience
- Increase network efficiency
- Reduced latency

Potentials savings of 10% to 50+%*

Input View

Run Model

Operator profile

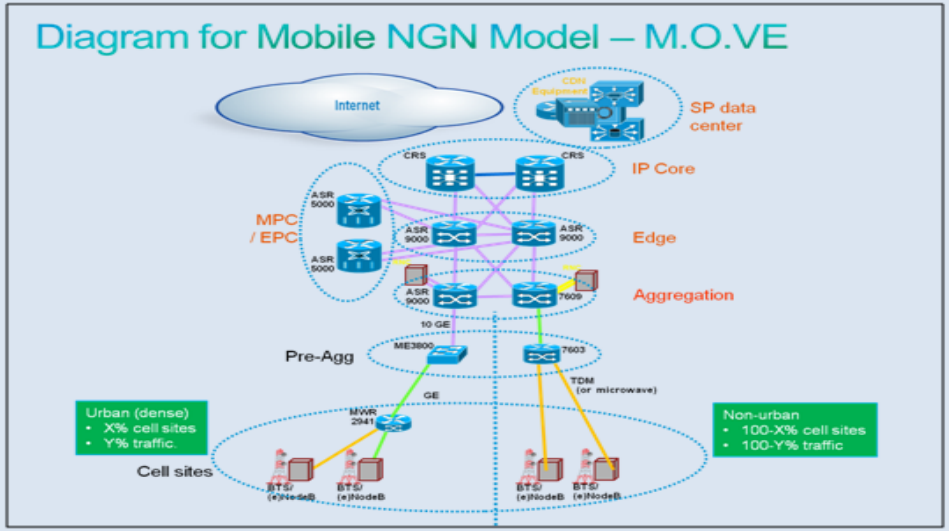
20,000,000	Subscribers (Yr1)	model grows this by 5% annually
50%	% of traffic in dense areas	i.e., in dense areas typically the % traffic is higher than the % of cell
30%	% of cell sites in dense areas	
10,000	Cell sites	model grows this by 5% annually
20	Ratio of cell sites to pre-aggregation sites	
50	Aggregation sites - urban	
50	Aggregation sites - non-urban	
8	Edge/packet core sites	
4	IP core sites	

Optimizations

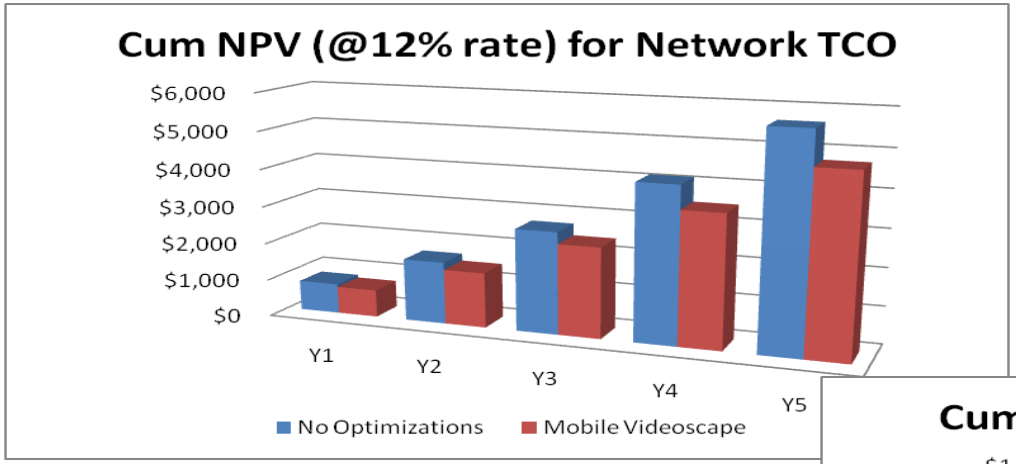
20%	Avg % reduction in traffic by appying video optimization
50%	Cache hit rate in Mobile Videoscape scenario

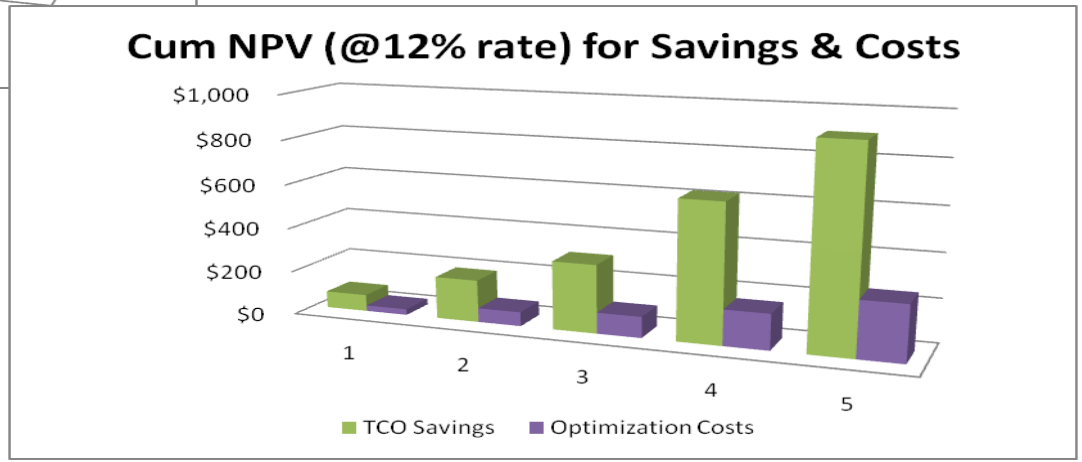
Other

60%	Global discount applied to Cisco GPL



Sample Outputs





Verizon Introduces New Version of VoD App for Mobile Phones

- VzW Mobile Video – On – Demand
- Customers access more than 250 current, full-episode TV shows from all the major broadcast networks
- Premium video content
- Requires a USD $10 monthly subscription

- *A data package is required, and the download and use of Verizon Video incurs data usage and will be billed according to the customer's data package.*

Source: 23 August 2011 Telecompaper Americas, Verizon Wireless Sources

MONETIZE

MONETIZE

Vodafone Germany Plans Triple Play TV with LTE

Challenge/Opportunity

- Current mkt dynamics: EUR500 mill./year in unbundled DSL costs
- Mkt Opportunity: Migrate DSL customers to LTE, incl. TV
- SP Strategic fit: Challenge DT on triple play with new bus. model

Experience Innovation

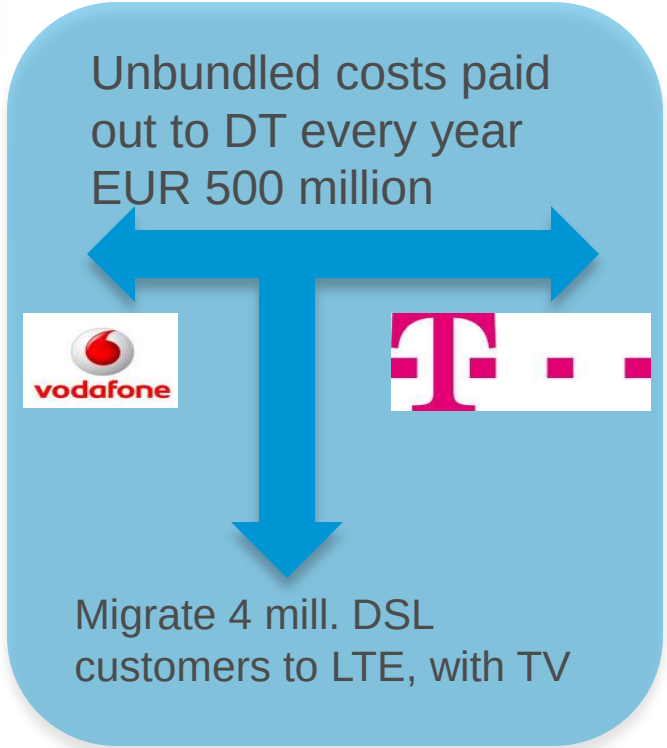
- Service description: LTE-enabled set top box for triple play
- Drivers for end-user adoption: Low cost via cellular
- Risks and sensitivity for service adoption: Availability, experience

Monetization

- Monetization: No unbundled costs improves 3-play bus. model
- Market size: Unknown
- Revenue sensitivity: NA
- Cost analysis: LTE bandwidth mgt. for TV packet prioritisation

Strategic Partnership/Alliance

- Ecosystem: None
- B2C
- Risk assessment 4I's:
    - Innovation, Internal, Interdependency: Low
    - Integration: High



The Mobile Network of Tomorrow

Unified Access - Macro, Pico, Femto, WiFi

Complexity

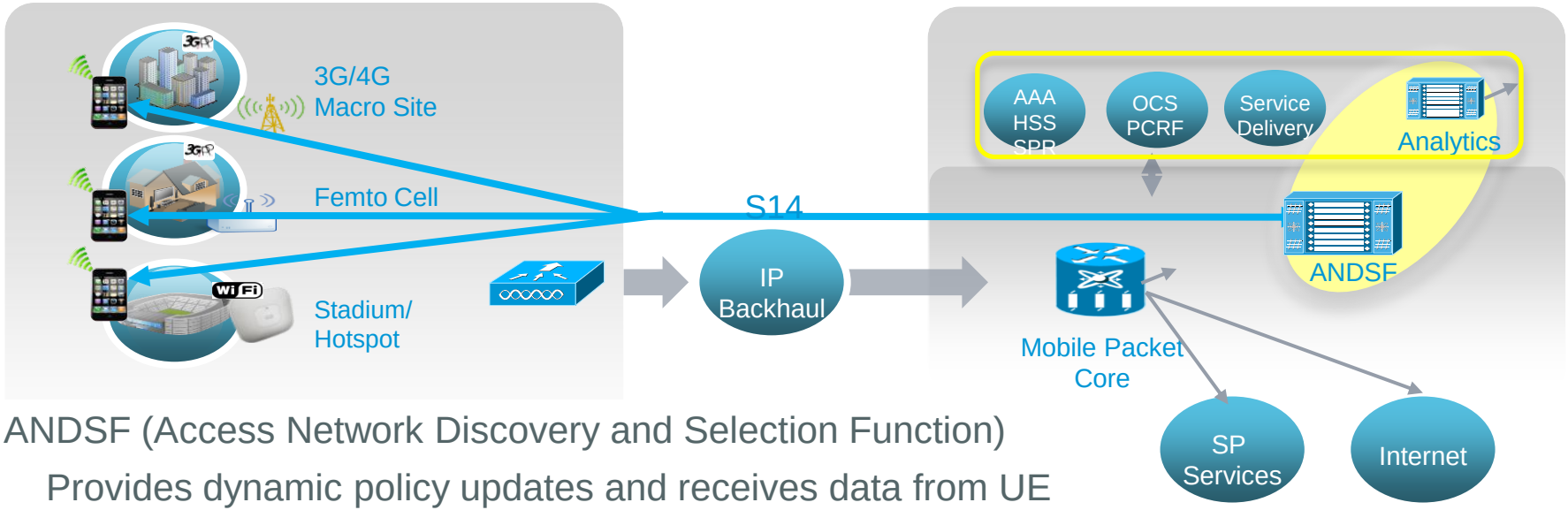
Access selected by end user or the device itself

Opportunity

Optimal usage of network resource under dynamic conditions for best user experience

- Real time access selection decisions based on location, network load, available connectivity, User service level
- Application and service driven traffic routing
- Inter-access load balancing
- Real time feedback for up to date network conditions

Leveraging the Device for Network Optimization

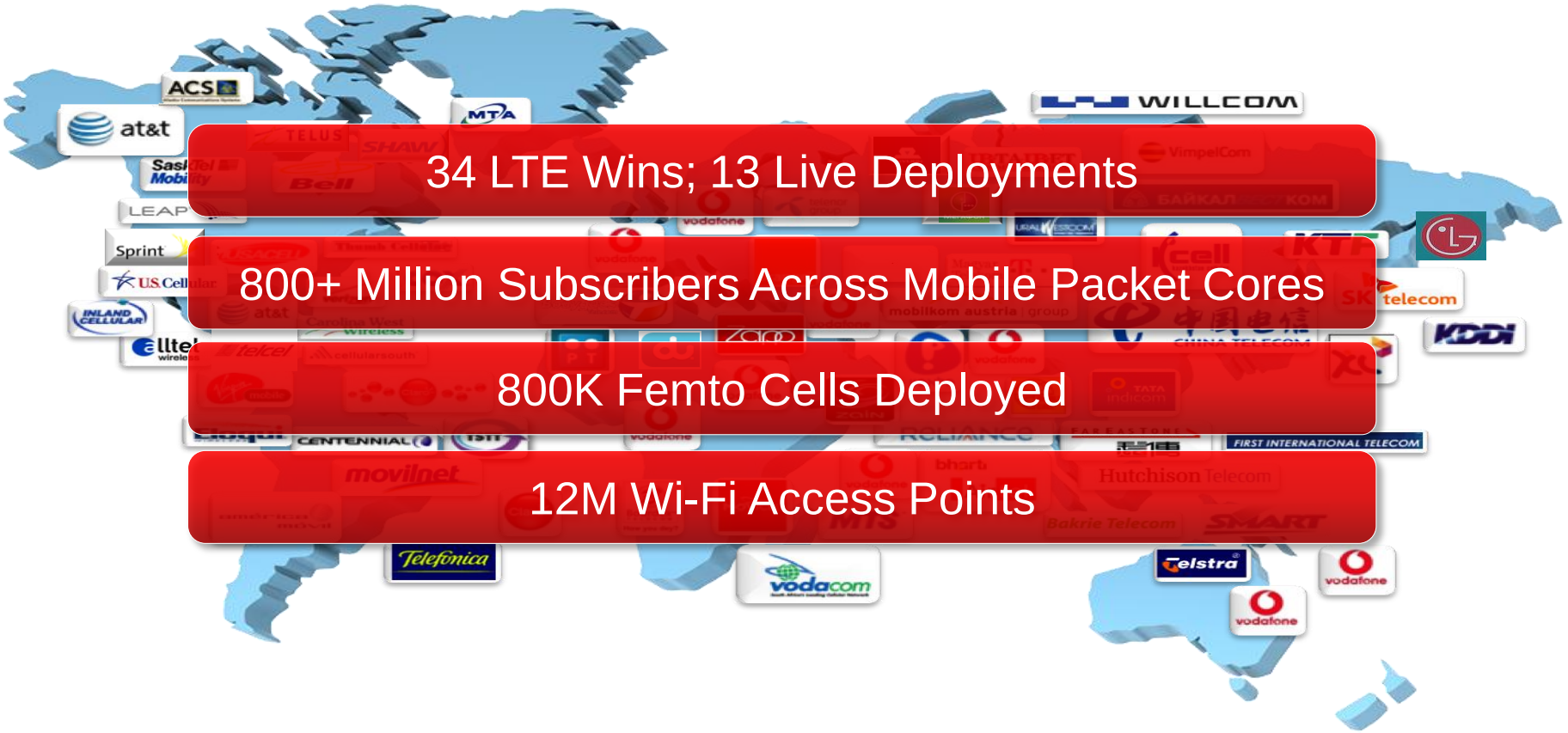


ANDSF (Access Network Discovery and Selection Function)

- Provides dynamic policy updates and receives data from UE
- Can constructs policies based on user profile, session status and dynamic network updates
- Dynamically pushes policy updates based on network triggers
- Receives data from the device and distributes it accordingly

Cisco Mobile Internet Market Leadership

270+ Operators in More Than 75 Countries



Q&A

Thank You
More information www.cisco.com/go/mobile