Shape Your Business For the Future:
Powering Transformation With Cisco

Mobile Broadband Monetization and Optimization

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Agenda

Market Overview

Solution and Benefits

Monetization

Optimization
Market Overview
Mobile Internet Market by 2016

- **More Mobile Connections**
  - > 10B devices

- **Enhanced Computing**
  - Powerful, high-bandwidth devices
  - Mobile outgrows fixed

- **Rich Media Apps & Content**
  - Video grows to 70.5% of mobile data

- **Faster Mobile Data**
  - >9-fold speed increase

1,800% Increase in Mobile Data Traffic from 2011–2016
Global mobile data traffic will increase 18X (10.8 EB/month) from 2011 to 2016.

Mobile VoIP traffic forecast to be 0.3% of all mobile data traffic in 2016.

By 2016, global mobile data traffic will reach an annual run rate of 130 exabytes per year.

130 exabytes is equal to:

- 130X more than all IP traffic generated in 2000
- 33 billion DVDs
- 929 quadrillion SMS text messages

In 2010, global mobile data traffic nearly tripled (2.6X growth) for the third year in a row, despite a slow economic recovery, increased traffic offload, and the advent of tiered pricing.

Global Mobile Data Traffic Growth / Devices
Smartphone dominate through 2016; tablets drive 10% of traffic by 2016

Other Portable Devices forecast to be 2.2% of all mobile data traffic in 2016

Mobile network speeds to increase >9-fold by 2016. The average mobile connection speed (315 kbps in 2011) will grow at a 56% CAGR, exceeding 2.9 Mbps in 2016.

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<tbody>
<tr>
<td><strong>Global</strong></td>
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<tr>
<td>Global speed: All handsets</td>
<td>189</td>
<td>315</td>
<td>504</td>
<td>792</td>
<td>1,236</td>
<td>1,908</td>
<td>2,873</td>
<td>56%</td>
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<td>Global speed: Smartphones</td>
<td>968</td>
<td>1,344</td>
<td>1,829</td>
<td>2,425</td>
<td>3,166</td>
<td>4,102</td>
<td>5,244</td>
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<td><strong>By Region</strong></td>
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<td>Asia Pacific</td>
<td>219</td>
<td>337</td>
<td>497</td>
<td>732</td>
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<td>Latin America</td>
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<td>125</td>
<td>227</td>
<td>396</td>
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<td>North America</td>
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<td>1,138</td>
<td>1,712</td>
<td>2,485</td>
<td>3,531</td>
<td>4,923</td>
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<td>Western Europe</td>
<td>431</td>
<td>667</td>
<td>1,196</td>
<td>1,967</td>
<td>2,960</td>
<td>4,163</td>
<td>5,549</td>
<td>53%</td>
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<tr>
<td>Central and Eastern Europe</td>
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<td>205</td>
<td>396</td>
<td>739</td>
<td>1,316</td>
<td>2,228</td>
<td>3,476</td>
<td>76%</td>
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<td>Middle East and Africa</td>
<td>52</td>
<td>89</td>
<td>206</td>
<td>434</td>
<td>850</td>
<td>1,555</td>
<td>2,618</td>
<td>97%</td>
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Source: Cisco Global Internet Speed Test (GIST) results and other independent speed test findings
Mobile Operator’s Three-Fold Challenge

**Increase Revenue**
- Enable Premium Services
- Create new business models

**Reduce Costs**
- Manage “over the top” video
- Maximize spectrum and radio assets

**Improve Customer Experience**
- Competitive Quality of Experience
- Popular Services and Features

**MONETIZE**

**OPTIMIZE**

**VIDEO EXPERIENCE**

Data Traffic (Cost)

Coming Profitability Gap

ARPU per Bit
Service Provider Advantage
Network Intelligence

Device Awareness
- Adaptation
- Translation
- Battery life

Access Technology Awareness
- Access-based on applications
- Access based on roaming partner

Session-State Awareness
- Service manipulation
- Service control and time of day

Mobility Control
- Application-based mobility control

Location Awareness
- Roaming
- Presence
- Reachability

Usage Visibility
- QoS management
- Innovative service offerings

Shape the Subscriber Experience

OPTIMIZE
MONETIZE
VIDEO EXPERIENCE
Cisco M.O.VE
Monetization, Optimization and Videoscape Experience

MobileVideoscape Experience
Across Devices, Networks and Content

Monetization
• Premium offerings
• Backend partnerships
• Differentiated video services

Optimization
• Optimal data transport
• Network awareness
• Subscriber intelligence

Comprehensive, Integrated, Intelligent
Solution and Benefits
Common Core For All Services

Small Cell
- Stadium
- Business
- On the go
- Cisco VideoScape™
- Video to go home

Unified RAN Backhaul
- Access
- Aggregation

Edge and Core
- IP Edge and Core
- Mobile Packet Core

Data Center
- Cisco Videoscape
- Mobile Cloud

Cisco® Advanced Services

Virtualized Cisco Prime™ Network Management
Mobile Packet Core
One Network, Any G, Any Screen

WiFi, Femto
2.5G, 3G
4G

World’s #1 UMTS and CDMA Operators

Single Platform for all Control and Bearer Plane Functions
ASR 5000 Virtualized Architecture
Software Decoupled from Hardware

- **Platform decision** based on performance not function
- **StarOS** distributed architecture – single software image
- **Processes** distributed across the entire system
- **Resources** automatically adapted to meet needs
Cisco MPC Solution
Common Core Independent of Access Technologies

Cisco MPC

Unified RAN

2.5G, 3G

4G

WiFi, Femto

Cisco MPC

2G SGSN
2G/3G/4G SGSN
3G SGSN
MME/SGSN
MME
ePDG/TTG/PDIF/HNB-GW
SGW
PGW
GGSN/PGW/SGW
GGSN
PCEF

ECS Stateful Firewall Content Filtering P2P Detection

Data Center

IP Core

Internet

ECS
Stateful Firewall
Content Filtering
P2P Detection

Intelligence enables
In-line services directly on the platform
Performance
Industry-Leading Mobile Packet Core Intelligent Performance

Superior Performance = Throughput + Transactions + Density
Cisco ASR 5000 In-line Services

Integrated Intelligence

**Monetize**

**Optimize**

**Secure**

Traditional Multi-chassis Solution
- Legacy Mobile Gateway
- Deep Packet Inspection, Enhanced Charging
- Policy Control
- P2P Detection
- Load Balancers

Cisco ASR 5000 Solution
- **In-Line Services**
- IP Network
- **In-Line Services**
- Enhanced Charging
- Content Filtering
- Intelligent Traffic Control
- Application Detection and Optimization
- Header Enrichment
- Subscriber Firewall/NAT
- Mobility Unified Reporting
- Traffic Optimization

Offer new services, shape subscriber experience, ensure efficient with a faster TTM and lower TCO
Cisco Policy and Charging Control (PCC)

Enabling a Smarter Pipe for Mobile Monetization

- Subscriber spending controls
- Service provider protection
- Subscriber interaction
- Service based controls
- Bandwidth, QoS
- TOD services, automated controls

Operational savings of 35%-40% versus competitive offerings
Mobility Unified Reporting
Analysis for Network Optimization, Targeting New Services

Optimize Network Performance
Target New Services
Plan Infrastructure Investments

Cisco® ASR 5000
WiFi to 3G/4G Packet Core Integration

Devices
- Secure Client based iWLAN
- S2c – DSMIP6
- S2c - DSMIP
- S2a - PMIP

WiFi AAA/BackEnd

Untrusted WiFi
- IPSec (SWu)
- S2c - DSMIPv6

Trusted WiFi
- S2c - DSMIPv6

4G Macro

IP Core

Mobile AAA

Policy/Billing

Evolved Packet Core
- ePDG
- S2b
- PGW
- S1
- SGW
Cisco V^2_oLTE
Circuit Switched Fallback and SMS Over LTE (SGs Interface)

ASR 5000 MME supports both the SGs interface for CSFB and SMS
• 3GPP compliant
• SMS works with CSFB without actually falling back
• CSFB forces the handover to 2G/3G circuit switched network to set up the call
Cisco V²oLTE
One Voice Solution

Integrated IMS and LTE Functions
Seamless IMS to CS Mobility
Cost Optimized Performance
Support for Messaging, Presence, RCS
Monetization
Monetizing the M.O.V.E Experience

B2B2C
Business to Business to Consumer

2-sided value – 2-side business model
Turbo Boost
Gain New Revenues with Bandwidth on Demand

Upgrade quality for $.99?

Quality upgraded
Freemium
Increase Customer Stickiness and Upselling

What’s the Opportunity?

• Offer access to popular applications (e.g., Facebook) for free for a trial period

How Will This Impact My Business?

• Unlimited access to popular services increases stickiness of service bundles and/or success of new device launch

• New service revenues gained from up-selling after user is “hooked” by free trial

Why Cisco?

• Integrated Charging, Application Detection & Control, Traffic Optimization, and Policy Enforcement lowers OpEx and accelerates Time-to-Market
“Toll-Free” Mobile Broadband
Monetize Traffic Over Flat Rate Plans

What’s the Opportunity?

• Application Service Providers (ASPs), businesses, etc. promote usage of applications and rich media web portals by paying for connectivity – “Toll Free” to subscriber

How Will This Impact My Business?

• Generate and monetize additional traffic over flat rate plans

Why Cisco?

• Integrated Charging, Application Detection & Control, Traffic Optimization, and Policy Enforcement lowers OpEx and accelerates Time-to-Market

• Increased 3rd party partnership opportunities

I want to check my Financial Advisor’s mobile web portal to access videos, webinars, financial planning tools, etc.
Day/Session Pass for Inbound Roamers

- Inbound roamers will be provided an option to purchase a day pass where Internet access is not bound by roaming charges.
- Inbound roamers will be offloaded directly via MSEG.
- Policies push down to MSEG for this user to offload Internet based traffic.
- MSEG provides GTP proxy with the option to offload Internet based traffic.
- Internet access from inbound roamers will be offloaded directly via MSEG.

Home based services in the portal will still go back to the H-PGW and roaming charges will be applied for these traffic.

Inbound roamer agrees to purchase the day pass and send sms.
Cisco M2M Solution for Operators

Increase Operator Value-Add with M2M-Tuned Network

- "M2M-Tuned" Mobile Operator Network
- High Activation Rates
- Diagnostics and Troubleshooting
- Stateful Geo-Redundancy for Recovery
- Network-Initiated PDP for "Wake up"
- Gateway Virtualization for QoS
- IPv6 Transition

Transportation and Shipping
Auto Care/Telematics
Utility & Power
Healthcare Providers
Security Services
Optimization
Optimization

- Function Integration
- 3G, 4G Integration
- Traffic (TCP, HTTP) Optimization
- Transcoding/Transrating
- Bandwidth Shaping
- Fair Usage
- Resource Management
- Network Offload
- Wi-Fi, femtocell Offload

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

*specific services, based on several network variables

Potentials savings of 10% to 30%*
Functional Integration Benefits

Example: Integrated Policy Enforcement

- Interactive web-based TCO/ROI tool
- Available for operator data inputs and assumptions
- Outputs customized White Paper with results

TCO for integrated architecture has 30-40% less OpEx than for a multi-chassis architecture

Traffic Packet Optimization
TCP, HTTP, Video Pacing

- Superior user experience
- Superior mobile bandwidth utilization
- Solutions for both data and video
- In-line capabilities reduce Opex and additional 30-40% over external solutions

Potential reduction of up to 15% in video traffic
Potential reduction of 30-50% in non-compressed text pages
Downlink data reduction potentially up to 25%

Data and Video Tsunami

Video / Data

45%

Data Center

Internet

UE

(e)NB MWR2941

Mobile Backhaul

7600

ASR9k

ASR5k

IP Core

CRS-1

ASR9k

Internet

webex

Google

YouTube

App

OS

App

OS

App

OS

App

OS
Cisco Mobile Videoscape Architecture
ASR 5000 Intelligence, Efficiency and Integration

- 2% of flows make up majority of bits
- Optimizes 50% to 75%
- Centralized Cloud architecture provides scale speed of deployment and low TCO

Video flows are redirected by ASR 5000 to optimization cloud others to the Internet

- AAA and PCRF
- All Flows
- 98% of Flows
- 2% of Flows

Cisco ASR 5000
GGSN/HA/PGW
Mobile Video Gateway

Distribution Center

Intelligence (DPI)
Policy Assignment
TPO

Data Center/Cloud
Content Adaption Engine (CAE)
Video Optimization
Mobile Offload Solutions
Multiple Options

Offload to WiFi, Femto

WiFi/Femto

MEF

Mobile Backhaul

Network Offload

UE

(e)NB

ميلر

ASR 1000

7600

ASR9k

ASR5k

IP Core

Content, Cloud

Nexus 7000

Network, WiFi, Femto Offload

Internet

Google

YouTube
Use Case – Fair Usage & Throttling

• Top User report
  – Top subscriber transferring 270GB in one month
  – Top 1000 contribute 40% to total traffic
  – Allows operator to fine tune Fair Usage limit to generate enough capacity reduction and minimize the number of subscribers affected

• Protocol by family
  – P2P was higher than expected (~25%)
  – Busy period much longer and later than anticipated
  – Able to refine throttling strategy to minimize impact to end users and preserve capacity for things that are critical to the operator

Real Customer Experience – Tier 1 in EMEA (2 Months from Request to Deploy)
P2P traffic reduced from 25% down to 15% of the total traffic, no unexpected data traffic increase in the last 6 months

Real Customer Experience – different Tier 1 in EMEA
Reduced traffic by 30% on network

Throttling need to be used carefully to preserve the subscriber experience
Cisco Mobile Internet Market Leadership

More Than 200 Operators in More Than 75 Countries
Thank you.