Service Provider Global Trends and Opportunities for Growth in Asia

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Smart mobile devices and rich consumer media are driving exponential data traffic growth globally

Global Trends

Mobile Devices

1 Billion smartphones and tablets in use
2 Billion by 2016

Mobile Data

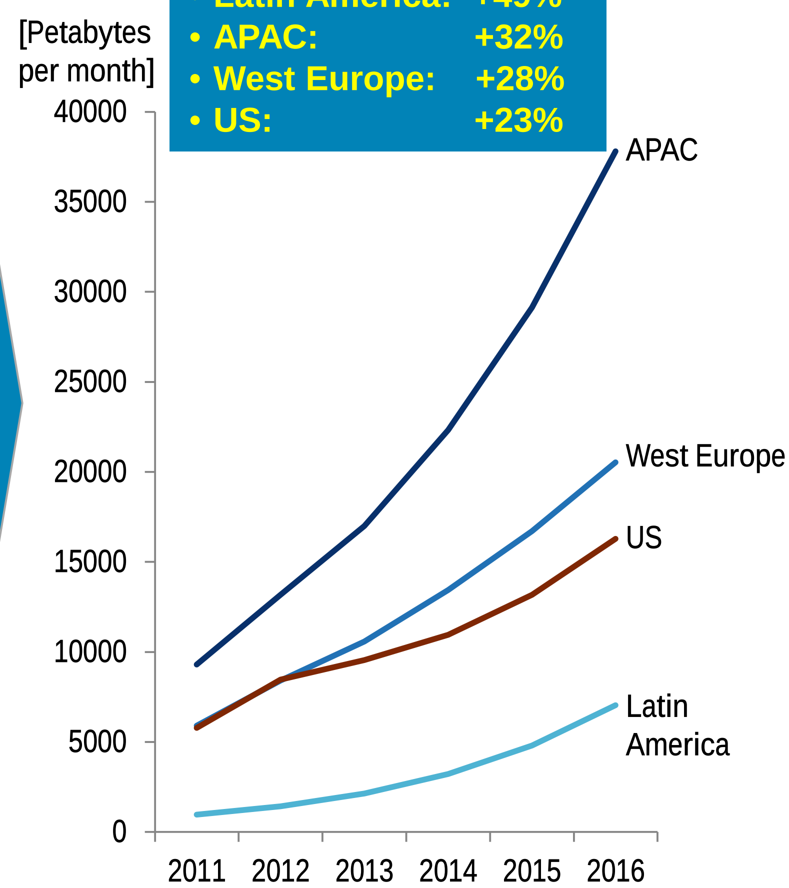
36% of mobile service revenues from Data today; 46% by 2016

Mobile Video

YouTube #1 mobile application, watched by 25% of US users

Data Traffic Forecast

2011-16 GAGR
- **Latin America: +49%**
- **APAC: +32%**
- **West Europe: +28%**
- **US: +23%**

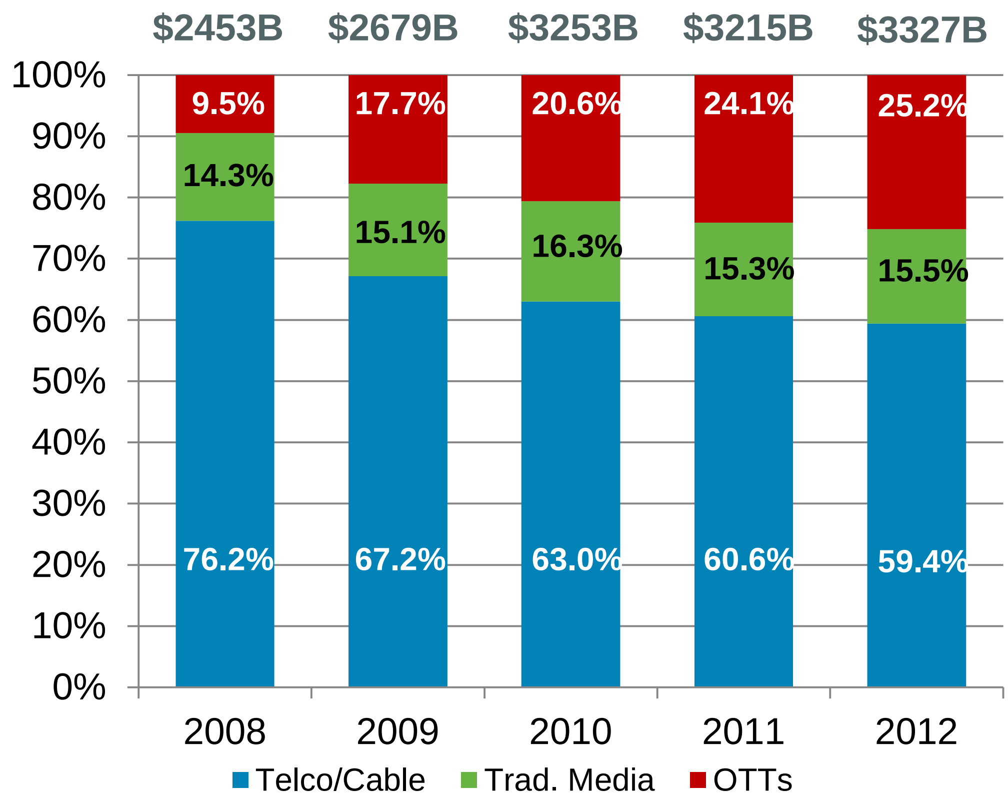


Source: Cisco VNI

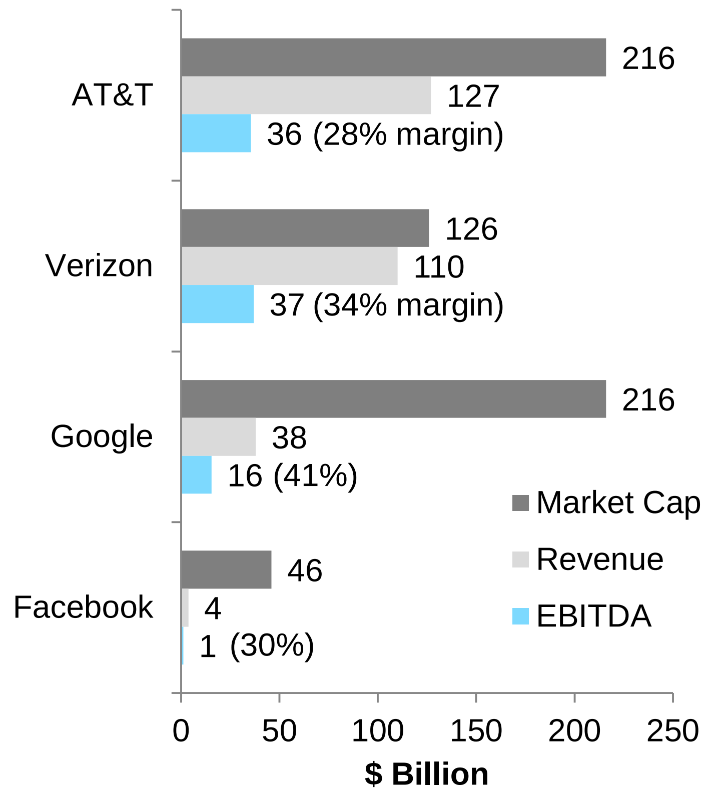
Source: IDC, Strategy Analytics, Sandvine, inStat, press search

But value shifting from Telecom Service Providers to Over-The-Top (OTT) Providers

Market Cap Trends for Top ~200 Global firms
In Telco / Cable, Traditional Media and OTTs



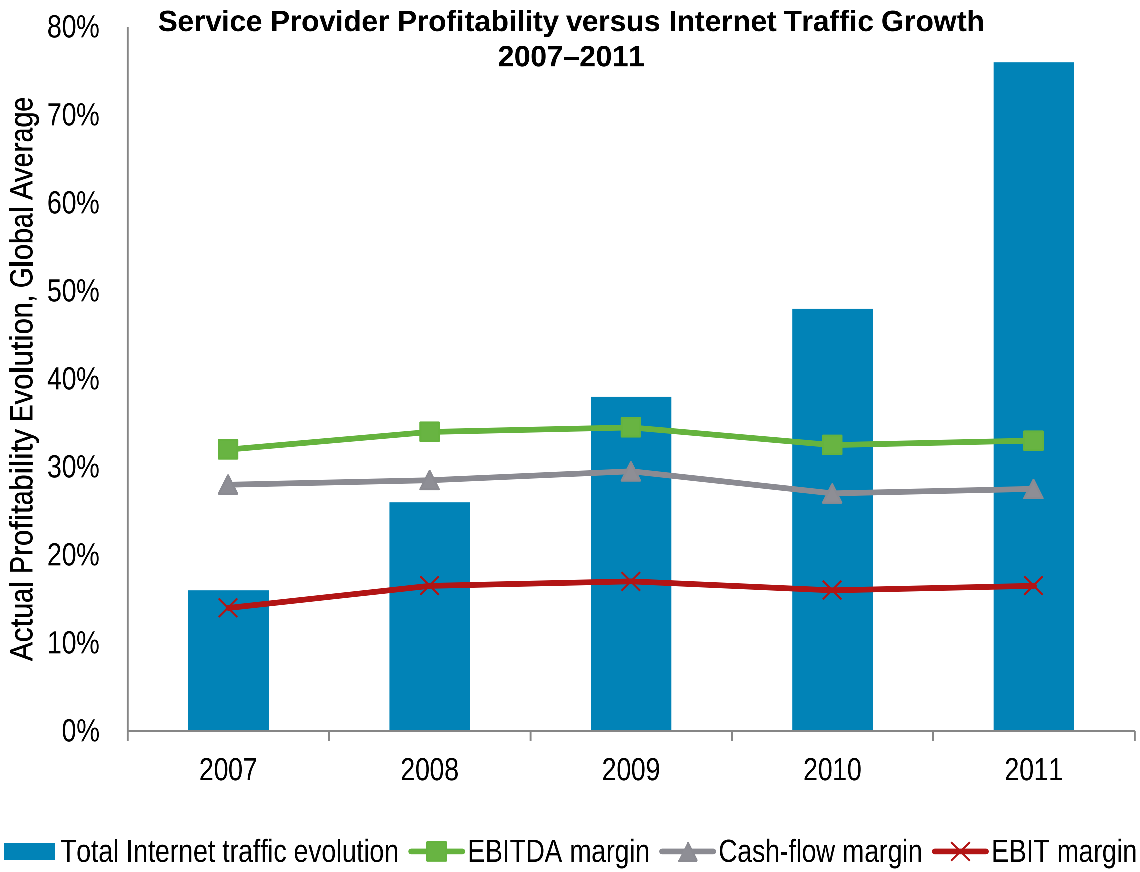
Market Cap, Revenue, EBITDA of Leading Service Providers and OTTs (US$ Billion)



Note: Telcos include ATT, Verizon, Vodafone, NTT DoCoMo. Media include Comcast, Time Warner. OTTs include Amazon, eBay, Google, LinkedIn
Source: Oliver Wyman 2012 SOI analysis, Cisco IBSG Analysis

To counter, service providers are now moving away from flat-rate pricing to tiered and value-based

Flat-rate pricing led to stagnant Service Provider profitability despite increased traffic



Source: Cisco IBSG Analysis of S&P Capital IQ. Data is based on figures from 124 publicly traded integrated SPs (fixed and mobile) from around the world, and on the Cisco Visual Networking Index, 2007-11.

Now, they are moving to capped, tiered or value-based pricing

Comcast: **300GB/month cap for fixed home broadband. Excess capacity available at $10 per 50GB.**

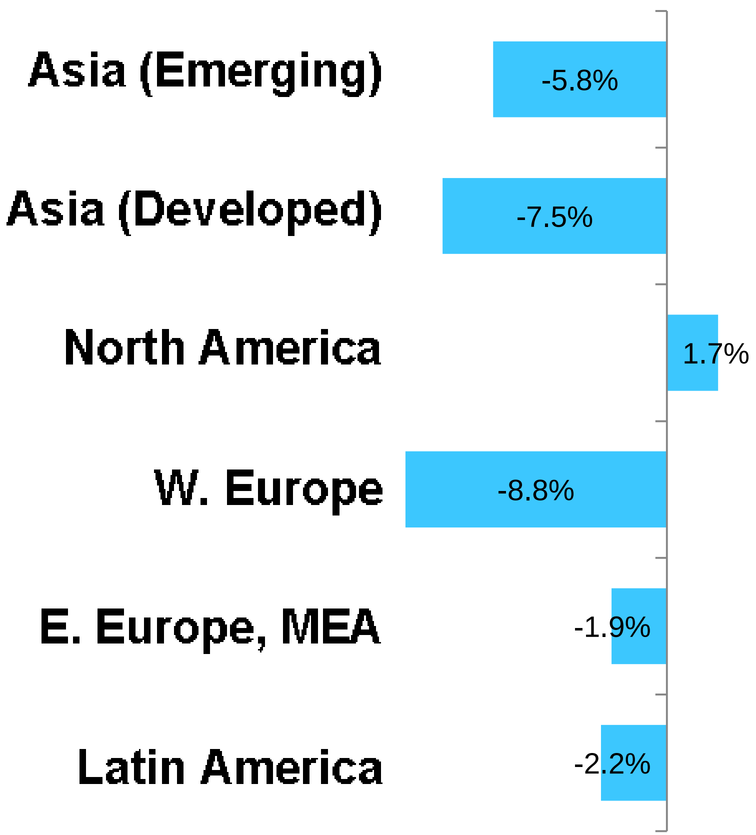
AT&T: **$30-50/month mobile broadband with 3-5GB cap, Excess fee of $10/GB.**

Time Warner Cable: **Offers $5 discount for light usage (less than 5GB/month). Full price for usage above 5GB/month**

Telecom Italia: **€3/month "Internet Play" option for game players for 40% increased speed (15% increase over their flat-rate broadband offering)**

Mobile Service Providers taking steps to combat declining ARPU

ARPU
(2010 versus 2012)



Mobile providers taking steps to restore ARPU

Verizon Wireless: Launched new services to increase ARPU

Verizon launched FiOS Mobile TV service at $13-15/month (Verizon mobile ARPU is $53)

Orange: Use lower-cost WiFi to complement macro cells and increase ARPU

Orange is one of the largest providers of Service Provider WiFi service with 30,000+ hotspots

Offers WiFi-specific services such as HD video and Web 2.0 portal with social networking apps/services

Telefonica UK: Mobile Advertising

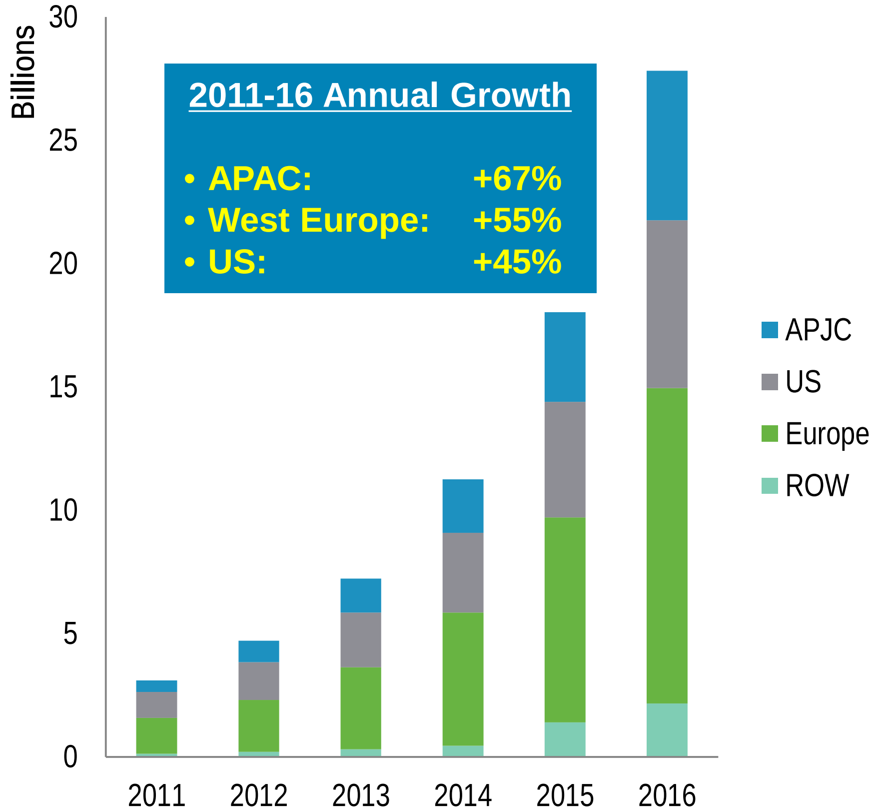
In July 2011, launched location-based advertisement (and mobile coupons) “O2 Priority moments”. GBP 5 million deal redemptions.

Planned bundling with mobile ticketing (“Priority Tickets”) and WiFi.

Source: BofA Wireless Matrix, Pyramid Research, BMI

Wi-Fi becoming a key focus for Service Providers to cater to nomadic use of consumer media and reduce mobile CAPEX thru 3G offloading

WiFi Hotspot Usage
(Billions of Sessions)



at&t

- **30,000+ access points**
- Restaurants, bookstores, supermarkets, airports, hotels, universities, convention centers, stadiums
- Outdoor WiFi for high-traffic areas in several states
- Seamless **3G offload** and authentication

BT

- **500,000 access points** (200,000 added for Olympics)
- Combination of BT-owned/operated and in independent business and homes

Designing The Future KDDI

- **Free WiFi** for subscribers of KDDI's Android mobile broadband subscribers in over 10,000 hotspots initially, scaling to **>100,000 access points**

WiFi traffic will account for more than half of total data traffic by 2016

Source: Cisco IBSG SP, Cisco VNI, In-Stat

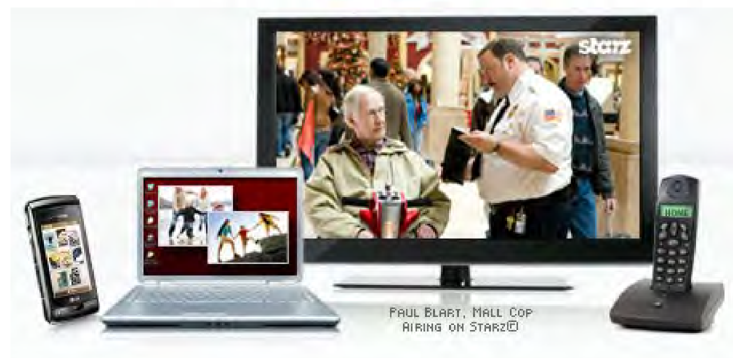
IP Video has enabled Service Providers to increase ARPU thru Triple and Quad Play

IPTV + Broadband + Voice

- U-Verse is AT&T's triple play service, offering IPTV, broadband and fixed phone over fiber network launched in 2006.
- By end of 2012, U-Verse serviced 8 million subscribers and 36% growth in U-verse revenues.
- Total bundled ARPU up more than 10% YoY

IPTV + Broadband + Voice + Mobile

verizon FiOS

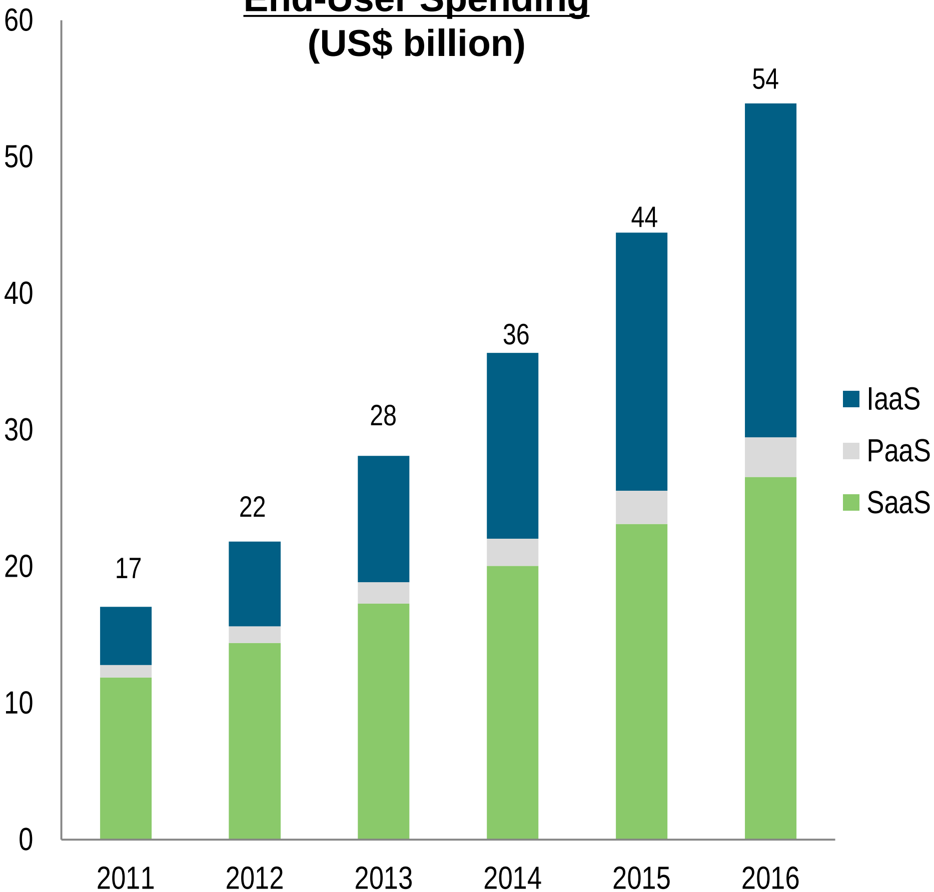


- Verizon's Quad Play service bundled mobile, home phone, broadband internet and IP TV.
- As of 2012, FiOS IPTV recorded 4.7 million users.
- Within 3-year, bundled ARPU increased from $54 to $80 (+50%)

Source: press searches and company websites

Beyond consumer, Service Providers have made in-roads in capturing US$54 billion enterprise segment

<u>Global Public Cloud Services End-User Spending</u>
(US$ billion)



Source: Gartner, Cisco IBSG analysis

Comcast

- In 2013, launched **app store Upware** to resell **SME cloud storage, security and collaboration** services from 3rd party vendors Mozy, Box, Norton, Microsoft.
- **$2.4 billion** revenue in 2012, **mostly from SME**.

Verizon

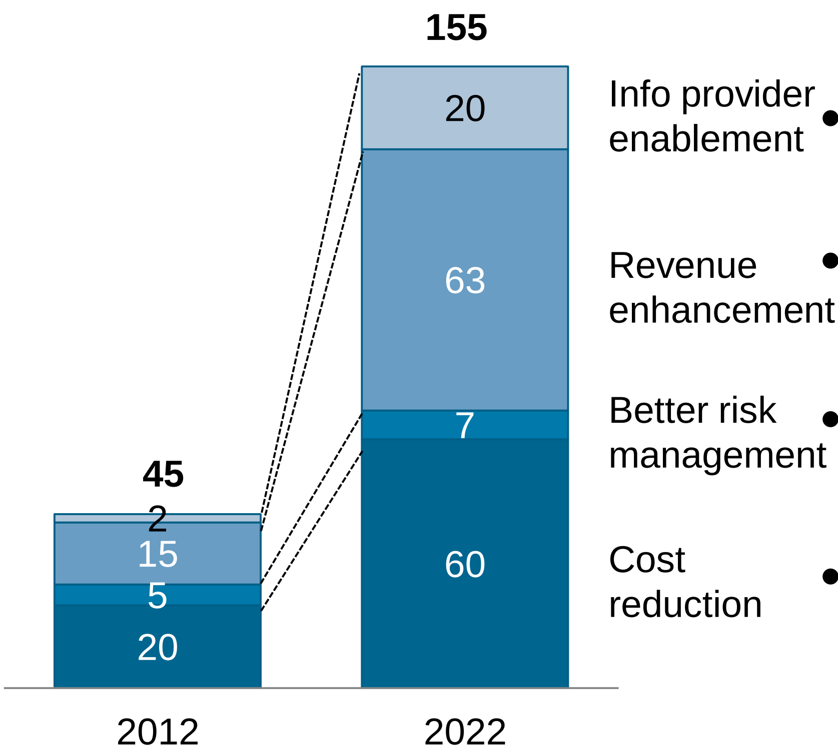
- In 2012, launched **bundled cloud-based SME unified communication** service, including e.g., VoIP, Google email, calendar, chat, video conferencing, voicemail.
- **US$1.4 billion acquisition of Terremark** in 2011 brings SMB and Government focus, as well as global footprint
- **Partner with SI** (Deloitte) for select go-to-market and customization

Savvis

- Purchased for **US$2.5 billion** by **CenturyLink**
- In 2012, launched **'Savvis Direct'** automated cloud services targeting SMB: hosted servers, cloud storage, and hosted applications from Microsoft and McAfee.
- **50 Data centers** (approximately 1.54 million square feet) in North America, Europe, and Asia.

Big Data / Analytics is the next frontier for Service Providers, with a huge value creation potential

Value to Service Providers Globally from Big Data (US$ billion)



50 billion devices will be connected to the internet in 2020

Financial service information by BT Radianz

- **BT Radianz** uses analytics to process and provide financial information to **15,000+ financial institutions**

Wi-Fi analytics at Copenhagen Airport's public areas

- **Location-based analytics** of visitors' browsing pattern to optimize ad / digital signage placements
- By Boingo and ThinkSmart Tech

Auto telemetry based Insurance pricing at Progressive

- Uses **M2M device –** AT&T GSM / GPRS wireless modem
- **Reduces financial risks** with accurate premium profiling based on **customer driving habits**

Network cost optimization at Vodafone

- Uses Big Data analytics to increase **network cost efficiencies** from intelligent traffic management while maintaining service quality

Source: Current Analysis, Heavy Reading, Company Websites

In APAC, Service Providers are improving profitability through revenue growth …

Strategic Levers		Examples
Innovative consumer services	• Introduce **new services to consumers** and capture **advertisement revenue. Leverage Analytics to tailor services to users behaviors**	Telstra: Telstra Media Mall integrates OTT services for a unified media experience. Offers tailored service recommendations based on data mining of user profiles.
Grow Enterprise Business	• Expand the **Enterprise/SMB segment** with vertical-specific managed service offers	NTT: NTT launches new WiFi-enabled managed services targeting retail and transportation sectors among others
Create New Partnerships	• Monetize increased traffic thru **new pricing plans** and **revenue sharing collaboration with OTT**	SK telecom: SKT's subsidiary SK Planet launched social media, N-screen, mobile ad services. US$250M revenue in 2011, US$3B goal by 2016
Develop New Competencies	• Identify **new trends** and build competencies to capitalize on ensuing **market transitions**	SingTel: SingTel building global competence in mobile advertisement, starting with purchase of Amobee mobile ad solution provider for $321M
Expand Globally	• Selectively **branch out** of domestic market and capture **regional and/or global** opportunities	NTT: Purchased system integrator DiData for $3.2B, giving footprint in 49 countries, 6000 enterprise customers

… and cost reduction

Strategic Levers		Examples
Optimize Mobile Access	• Use **WiFi** to offload 3G traffic and reduce mobile network CAPEX	KDDI deployed 100,000 hotspots in high-density areas to relieve data traffic congestion
Reduce fixed network cost	• Cap network investment growth by deploying mobile **CDN**	Telstra plans to save up to $4-12 of local transport cost for every $ invested in CDN
Unify into IP Network	• Transform existing and disparate networks into a single **converged IP platform**	SingTel, focus on all-IP NGN to reduce network costs
Infrastructure sharing	• Moving beyond mobile tower sharing to **sharing of network infrastructure** – capacity, IT platform – for greater economies of scale	Bharti Airtel outsourced entire IT infrastructure across India and Africa subsidiaries to IBM to realize economies of scale benefits. 5-year revenue share to supply, install, manage IT hardware and software incl. 3rd party's

In Indonesia, improving purchasing power will drive continued growth of data traffic

Income distribution in Indonesia (Millions)

2012	Monthly household expenses (IDR Millions)		2020
2.5	*Elite*	*>7.5*	6.9
6.6	*Affluent*	*5.0 –7.5*	16.5
23.2	*Upper mid*	*3.0 –5.0*	49.3
41.6	*Middle*	*2.0–3.0*	68.2
44.4	*Emerging*	*1.5 –2.0*	50.5
65.4	*Aspirant*	*1.0 –1.5*	47.9
64.5	*Poor*	*<1.0*	28.3
74 Millions	***Total middle class***		***141 Millions***
30%	***% of total population***		***53%***

Note: Middle class includes middle, upper middle, affluent and elite consumers
Source: Government statistics (BPS), BCG population and expenditure database, United Nations statistics, Cisco IBSG analysis

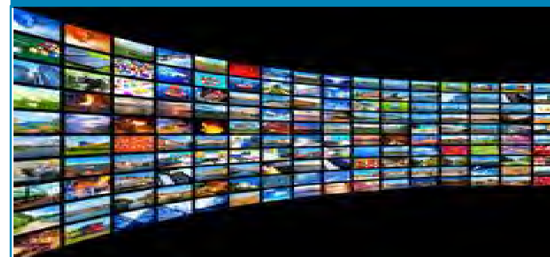
Projected growth of mobile data …

3.5x Mobile data traffic growth 2012-16
- **2012: 16 Petabytes**
- **2014: 59 Petabytes**

2x Smartphone penetration
- **2012: 15 million**
- **2014: 30 million**

2x Mobile data revenue
- **2012: 17%**
- **2014: 36% of total mobile revenue**

Growth Opportunities for APAC Service Providers
WiFi, Cloud, Video services

	WiFi Services	Cloud Services	Video Services
			
APAC market revenue	***$4 billion***	***$7 billion (Enterprise/SMB)*** ***$26 billion (Consumer)***	***$212 billion***
Opportunity	• Save massively on 3G / 4G offload • Create new revenue streams from vertical solutions	• Largest opportunity in IaaS • SaaS needs ecosystem building • Capture Mobile Cloud opportunity - Apps Stores Ads, Gaming, etc.	• N-screen, social media, Web 2.0 video services • Collaboration with OTT and/or media companies involving customer analytics
Key success factors	• Seamless roaming and authentication with 3G/4G • Venue selection for WiFi • New business models	• Broad, but targeted offers • Attractive GTM (PAYU, in-house SI) • Ecosystem partnerships	• Premium content • Low cost device bundling • Disruptive access fee

Note: Market revenue before distribution to value chain partners. 2016 figures.

WiFi: Multiple monetization business models emerging, in addition to traffic offload savings

Internal value to Service Provider

Cost Savings
Data offload

Indirect
- Retention
- Market share
- Up-sell

Service Provider selling to Consumers

End-user Access
Fee-based service for heavy data customers with higher speed

Services
- VoIP & Video
- Premium hot-spot
- Connected home

Service Provider selling to Other Providers

Federation
Roaming
(Allows users from one provider to roam on WiFi network of other provider)

Offload
Offload wholesale

Service Provider selling to Businesses

3rd Party
- M2M (e.g., smart meters, telemetry, vending machines)
- Advertising

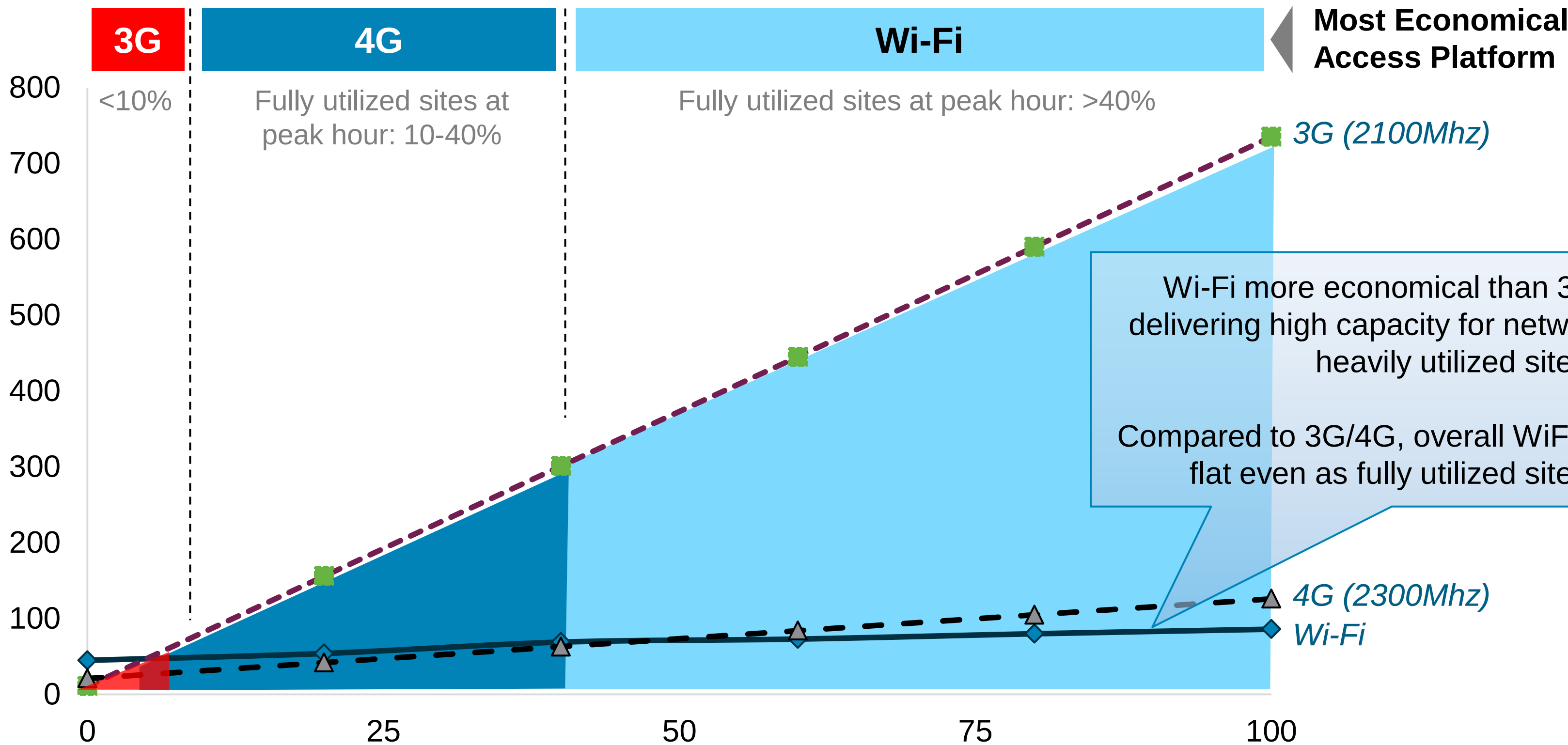
Venue Owners
- University / schools
- Stadiums
- Municipality
- Trains / stations

Source: Cisco IBSG Press search

WiFi: More economical than 3G and even 4G for high capacity in busy hours

Example: Variation of 5-year TCO of access platforms for major APAC Service Provider (excluding spectrum fees)[1]

$ million



1. No of subscribers increase from 150,000 in year 1 to 1 million by year 5; Subscriber density at 5000 per sq km; Typical subscriber profile:Gold (consuming 5 Mbps+) – 5% of all subscribers, Silver (consuming up to 1 Mbps) – 20% of all subscribers, Bronze (consuming up to 256 kbps) – 75% of all subscribers; Coverage area for each site, includes Wi-Fi – 0.2 sq km, 3G (at 2100 MHz) – 28 sq km, 4G (at 2300 MHz) – 13 sq km; Capacity per site, includes Wi-Fi – 25 Mbps, 3G (at 2100 MHz) – 6 Mbps, 4G (at 2300 MHz) – 59 Mbps

SOURCE: Cisco IBSG SP- Comparative Access Platform Economic Model

WiFi: Enabling tailored vertical services

Sports / Entertainment

In-stadium services
- Media and fan WiFi networks
- Mobile PoS Mobile merchandising
- Premium content and applications

Transportation

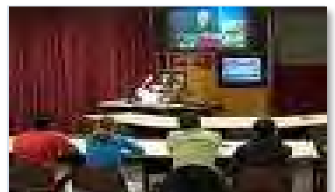
Train/subway station services
- Platform signage
- Digital merchandising
- Small-format in-vehicle displays
- Station operations

Retail

In-store services
- Mobile marketing
- Shopper services
- Mobile payments
- Store operations

Hospitality / Real Estate

Hotel / shopping center services
- Tenant , store operations and guest access
- Location-based info and promos
- Surveillance



Education

School / university services
- Managed private campus networks
- Nationwide WiFi educational network with cloud-based content

Signage and Analytics

Digital-signage-based services
- Hyper-local advertising based on behavior analytics of users nearby signage
- Delivery of public announcements and local information for municipal government (for fee or in exchange for access to location)

Enterprise / SMB Cloud: Key success factors to capture this market opportunity

	Description	Examples
Broad service portfolio	• High-end **enterprise-grade** for mission critical needs, lower-end "**web grade**" for non-business critical • **On-premise and hybrid** managed cloud for large enterprises • **Bundling with apps / SaaS and network services** to lock-in customers (one-stop service)	NTT Communications Various levels of cloud solutions: multi-tenant and dedicated, on-premise and hosted cloud
Sophisticated Go-To-Market	• **PAYU/PAYG** schemes especially for large customers • **IT professional services (in-house SI)** to help customers migrate to cloud, and tailor or **verticalize** solutions	SingTel PAYU scheme, highly competent IT consulting
Ecosystem partnership	• Partnership with **system integrators** for GTM, and post-selling integration and tailoring • And with **software / app vendors** for SaaS and PaaS	Telstra SingTel Partnership with Microsoft and other ISVs like Salesforce.com
Comprehensive guarantees	• **99.99% availability or better** • **End-to-end SLAs** including 3rd party's (e.g., SaaS vendors') • **Performance: time-to-market** of new features and agility	NTT Communications SLAs with up to 99.99% availability, end-to-end SLA management is available

Source: IBSG SP analysis

Consumer Mobile Cloud: Enabling innovative services

Speech Translation App

NTT docomo

Hanashite Hon'yaku

Phone-to-phone Conversation Image

(Users view translations on screen and/or listen to voice readouts)

Face-to-face Conversation Image

(Users view translations on screen and/or listen to voice readouts)

- Translates between Japanese and the receiver's language, e.g. English, Chinese, Korean.
- Translations utilize cloud for processing and shown as screen text and voice readouts.
- User dials other party using Android app. Or, have face-to-face conversation in which two users share an Android phone.

Mobile Telematics

SK planet

Mobile in Vehicle (MIV) and T-Map Link

- MIV uses smartphone to do remote vehicle diagnosis (brake performance, fuel), control car functions (door, headlights) and monitor car location.
- T-map, mobile navigation service, ranks 1st place in S Korea with >10 million subscribers.
- T-map link enables users to transmit contents from smartphone to tablet PC screen in the car through wireless tethering. Drivers can view T-map on tablet screen for larger display.

Source: press searches and company websites

Video Case Study: Reliance's *Video-as-The-Next Voice* strategy to disrupt India market

RIL to offer low-cost 4G tablets to attract customers

- **Partnering** with tablet manufacturing and marketing companies such as **Datawind**
- Prices expected to start at **$50-60 for low-end 4G** tablets and go up to $200 for high-end 4G.
- Basic Android 2.3 tablet. But demand still very high
- **Subsidies not likely** due to relatively low cost of tablet
- Low-end hardware (700MHz CPU, 256MB RAM, 2GB storage) is ideal for a mobile cloud

Also planning to offer cheap broadband to lower service entry barrier

- At a reported US$0.20 per GB, Reliance's offer will be it will be at least 90% cheaper than competition entry-level plans (97% cheaper in cost per GB)
- Signals that Reliance will rely heavily on media content as revenue source, as opposed to data fees

Extensive acquisitions of media companies and partnerships to offer premium and exclusive content

- Acquired stakes in **cable operator** (Den Network) to get last-mile connectivity for fixed-line services
- **Partner with content provider Network18** for preferential access to content
- Partnering with other content providers (Zee, UTV, Sony India) to offer **full-length feature films and VoD**

Video Case Study: Telstra uses *Media Mall* to bring integrated user experience and combat new entrants

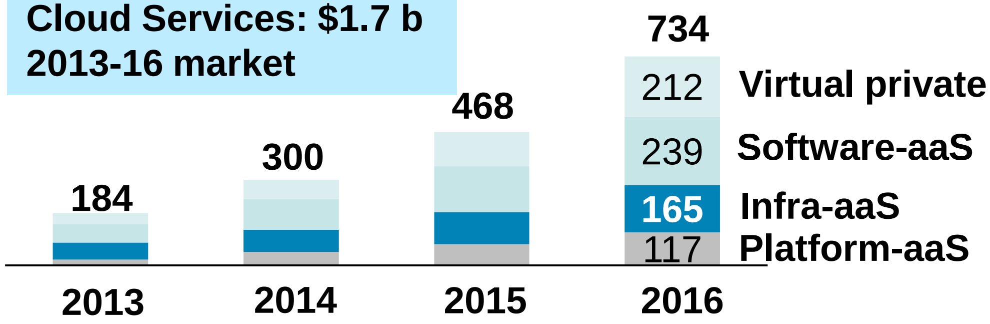
In A Nutshell

- Launched T-Box IPTV service in 2010, expanding into unified **Media Mall** concept
- Part of plan to increase **customer loyalty** due to potential new entrants enabled by NBNCo
- **Video triple-play**: TV, VOD, OTT content (incl. social media and gaming)
- **US$38 ARPU lift** expected from new features like VOD, gaming and ads
- **OTT integration**; e.g., YouTube, Facebook
- Content discovery via **search** and **profile-based recommendation** across all content partners

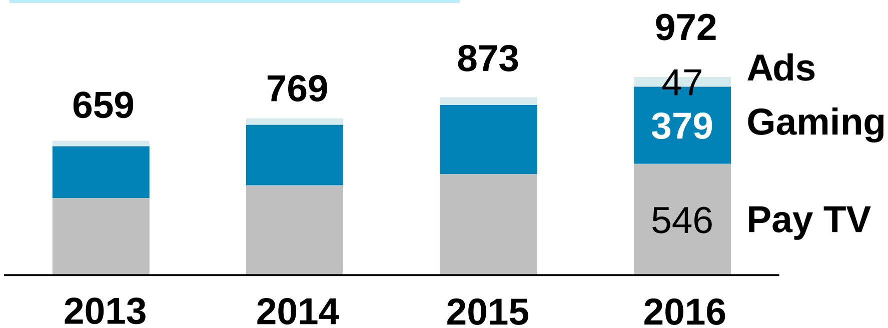
Source: Telstra

How Cisco Consulting Services can help you address these growth opportunities in Indonesia

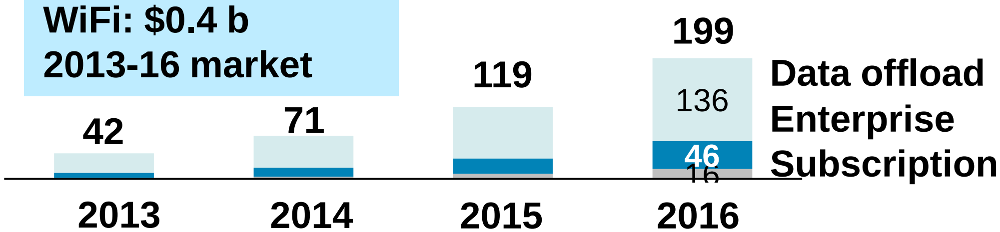
Cloud Services: $1.7 b
2013-16 market



Video Services: $3.3 b
2013-16 market



WiFi: $0.4 b
2013-16 market



How we can help

- Global best practice sharing
- Dedicated tailored deep dive business consulting engagements
- Pilots and market entry strategies
- Our consultants have extensive management consulting experience as well as deep industry knowledge

Source: IDC, Ovum, PWC media outlook

CISCO