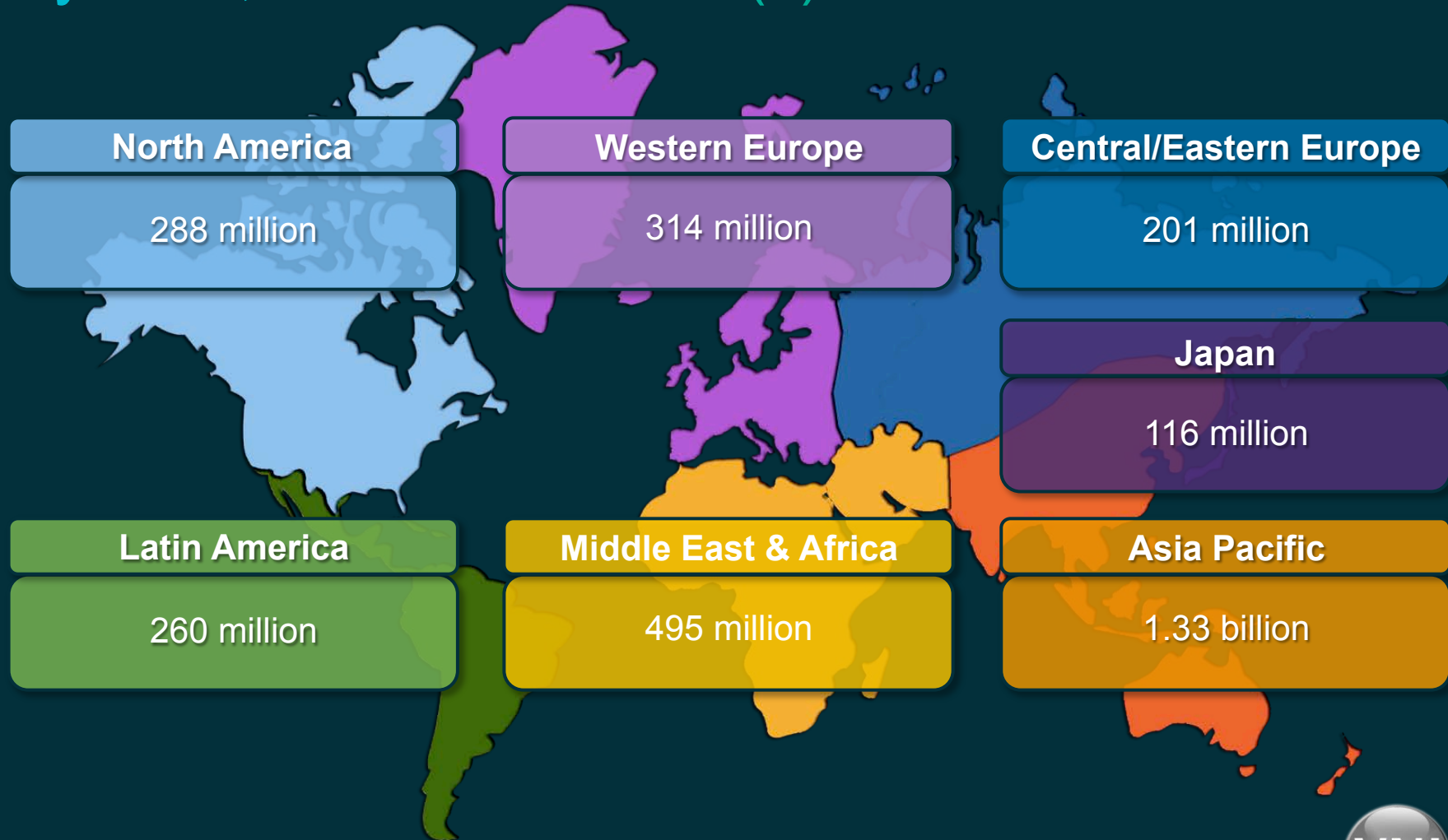# Starting Point for the Future: The World in 2016

Robert Pepper
Vice President
Global Technology Policy

Beyond Broadband
17 April 2012

Global Internet Users by Region, 2015
By 2015, there will about 3 (4) B Internet Users

North America	Western Europe	Central/Eastern Europe
288 million	314 million	201 million

		Japan
		116 million

Latin America	Middle East & Africa	Asia Pacific
260 million	495 million	1.33 billion

Source: Cisco Visual Networking Index (VNI) Global IP Traffic Forecast, 2010–2015

VNI

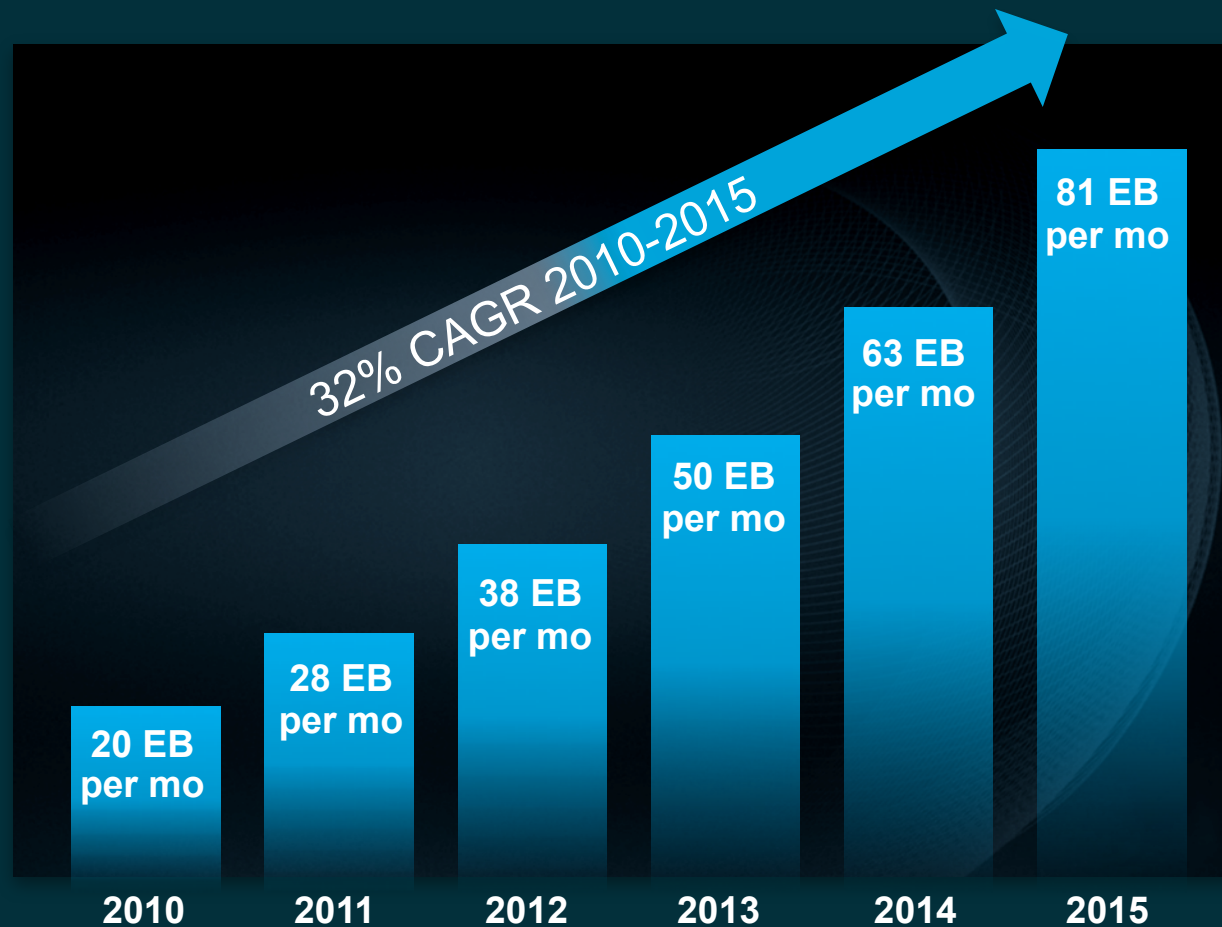By 2016, there will be 1.4 mobile connections (devices and M2M) per capita.

There will be more than 10B mobile connections (devices & M2M nodes) and 7.3B people.*

United Nations 2016 Global Population Estimate

Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2011–2016
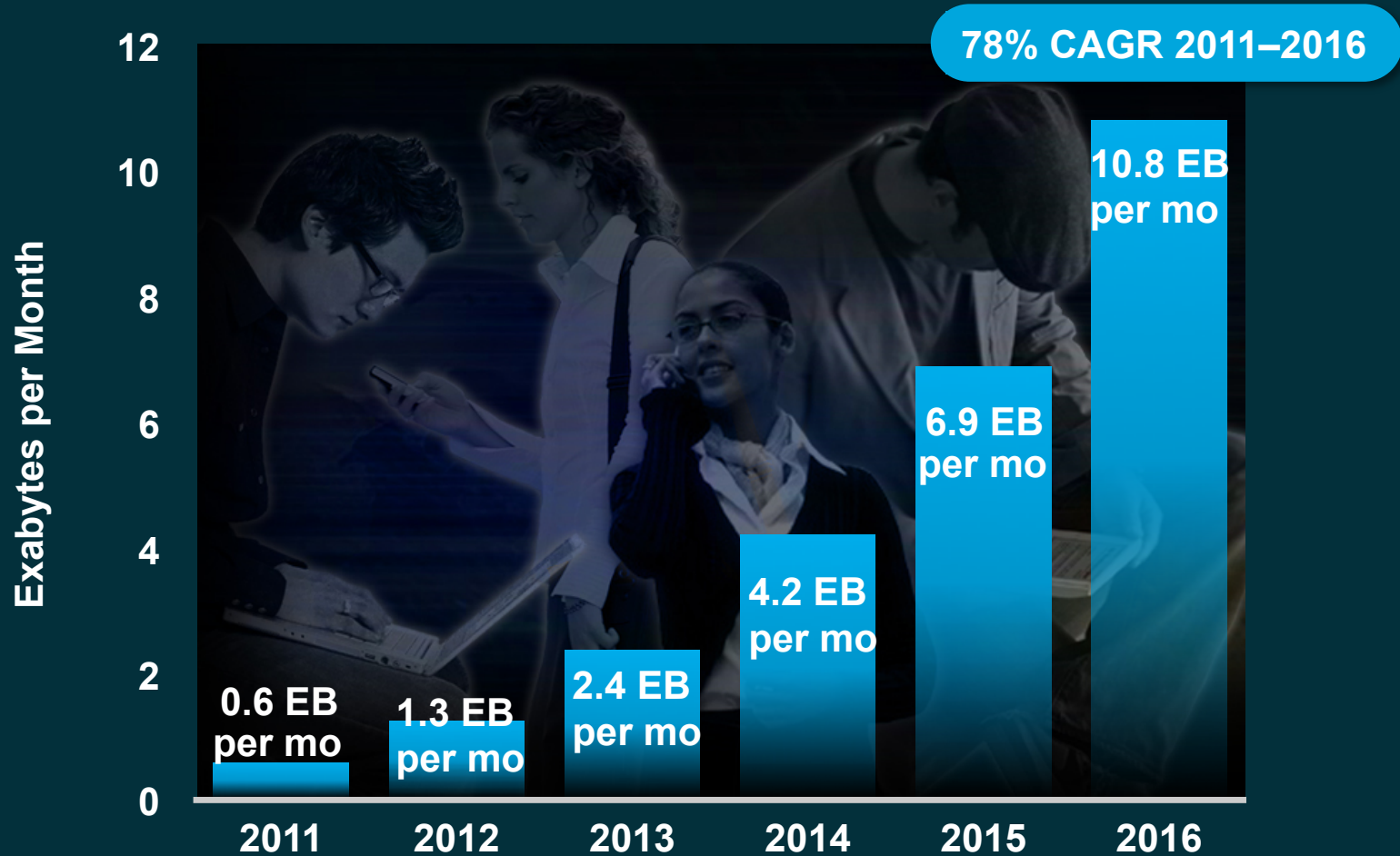
Entering the Zettabyte Era
Global IP traffic will increase 4-fold from 2010 to 2015

32% CAGR 2010-2015

Year	Traffic
2010	20 EB per mo
2011	28 EB per mo
2012	38 EB per mo
2013	50 EB per mo
2014	63 EB per mo
2015	81 EB per mo

Source: Cisco Visual Networking Index (VNI) Global IP Traffic Forecast, 2010–2015

Global Mobile Data Traffic Growth
Global Mobile Data Traffic will Increase 18X from 2011 to 2016

78% CAGR 2011–2016

Exabytes per Month

- 12
- 10
- 8
- 6
- 4
- 2
- 0

0.6 EB per mo — 2011
1.3 EB per mo — 2012
2.4 EB per mo — 2013
4.2 EB per mo — 2014
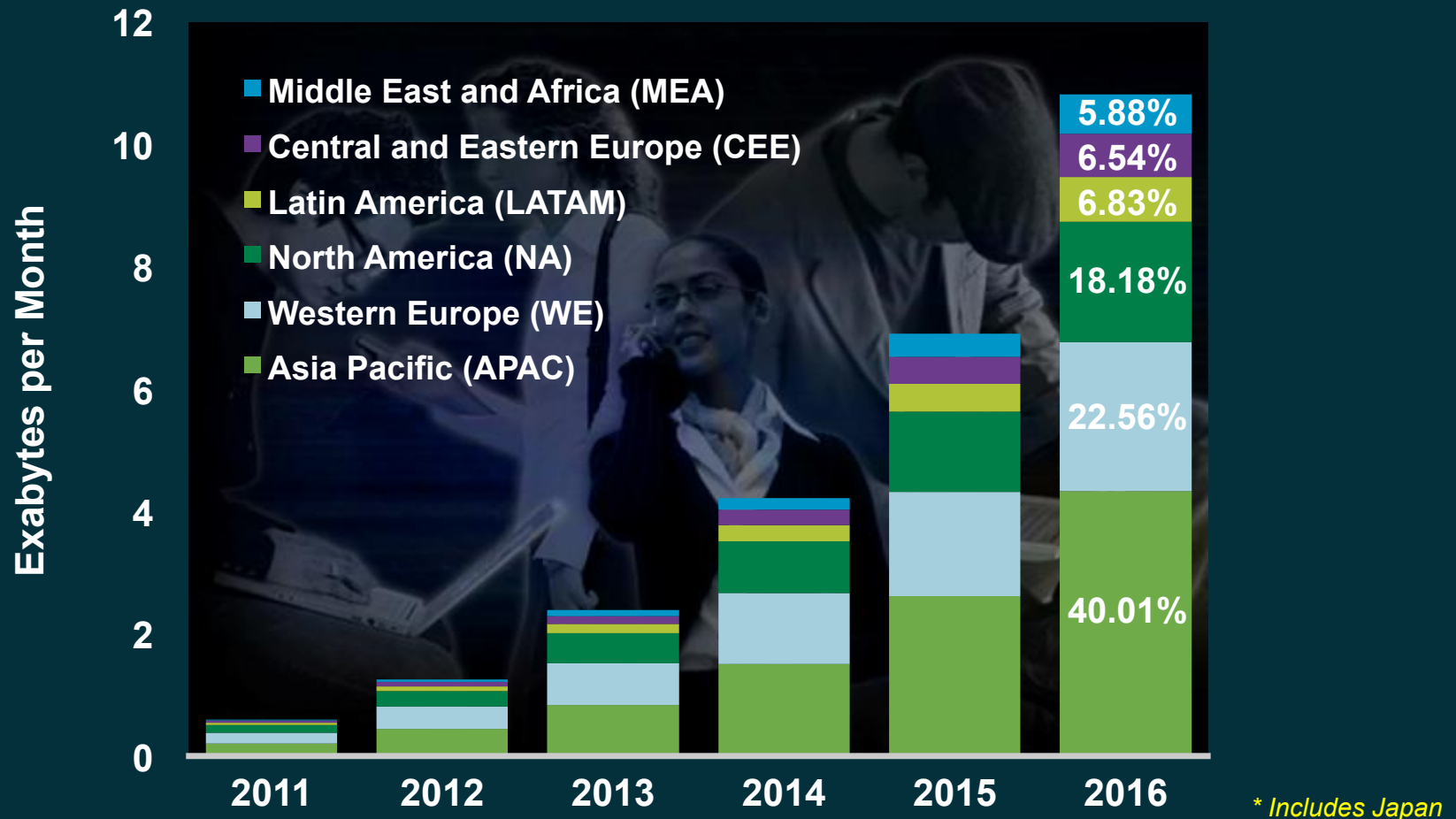**6.9 EB per mo** — 2015
10.8 EB per mo — 2016

Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2011–2016

Global Mobile Data Traffic Growth / Regions

MEA has the Highest Growth Rate (104%) from 2011–2016
APAC* will Generate 2/5th of all Mobile Data Traffic by 2016

Exabytes per Month

- Middle East and Africa (MEA)
- Central and Eastern Europe (CEE)
- Latin America (LATAM)
- North America (NA)
- Western Europe (WE)
- Asia Pacific (APAC)

2016 values:
5.88%
6.54%
6.83%
18.18%
22.56%
40.01%

2011 2012 2013 2014 2015 2016

* Includes Japan

Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2011–2016
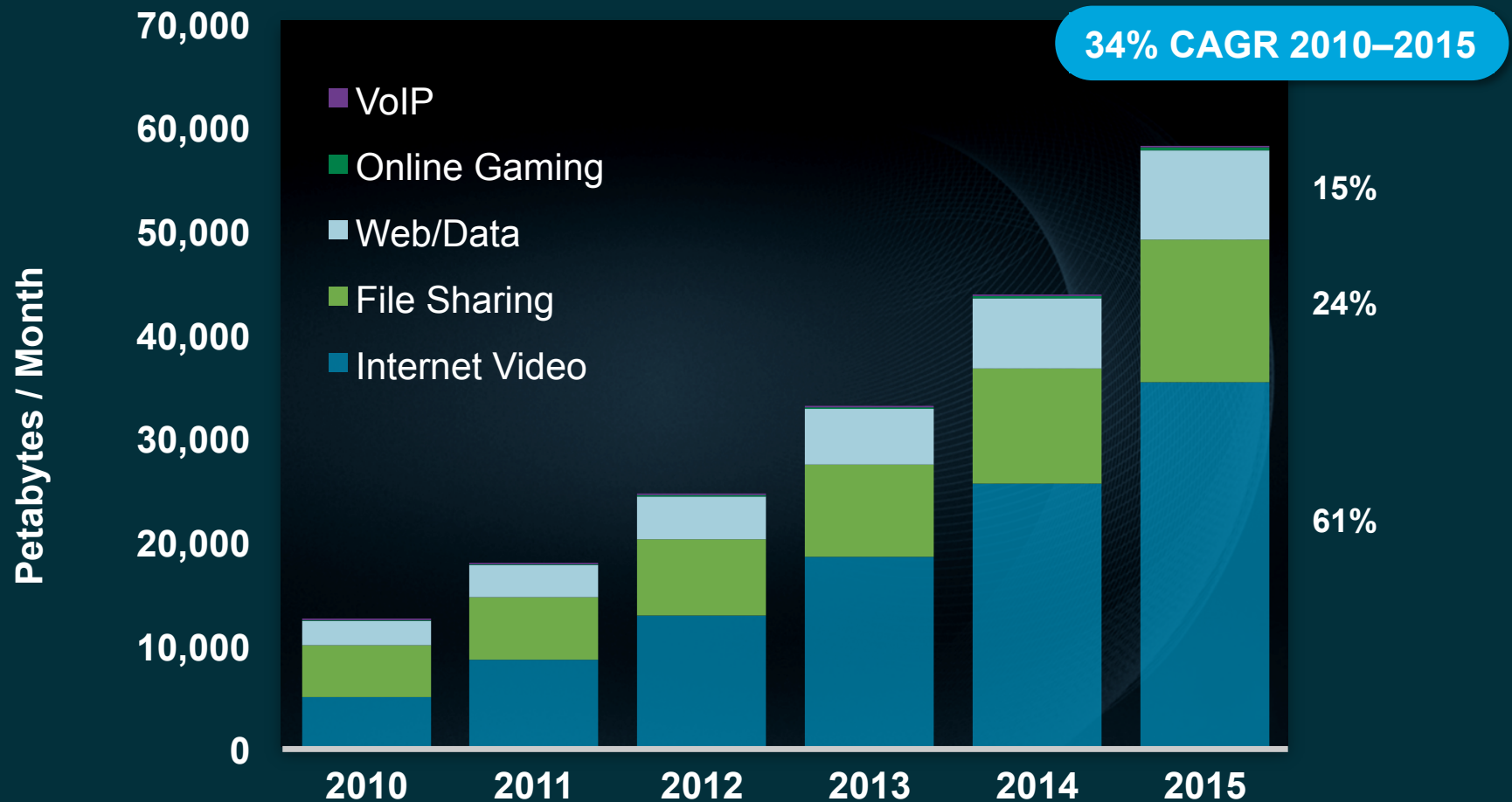
By 2016, <mark>60 percent</mark> of mobile users (3 billion people) will consume/generate at least
one gigabyte of mobile data traffic per month.

In 2011, <mark>0.5 percent</mark> of mobile users consumed/ generated 1 GB/month

Global Consumer Internet Traffic / Applications
Internet Video dominates consumer Internet traffic

34% CAGR 2010–2015

Petabytes / Month

- VoIP
- Online Gaming
- Web/Data
- File Sharing
- Internet Video

70,000
60,000
50,000
40,000
30,000
20,000
10,000
0

2010   2011   2012   2013   2014   2015
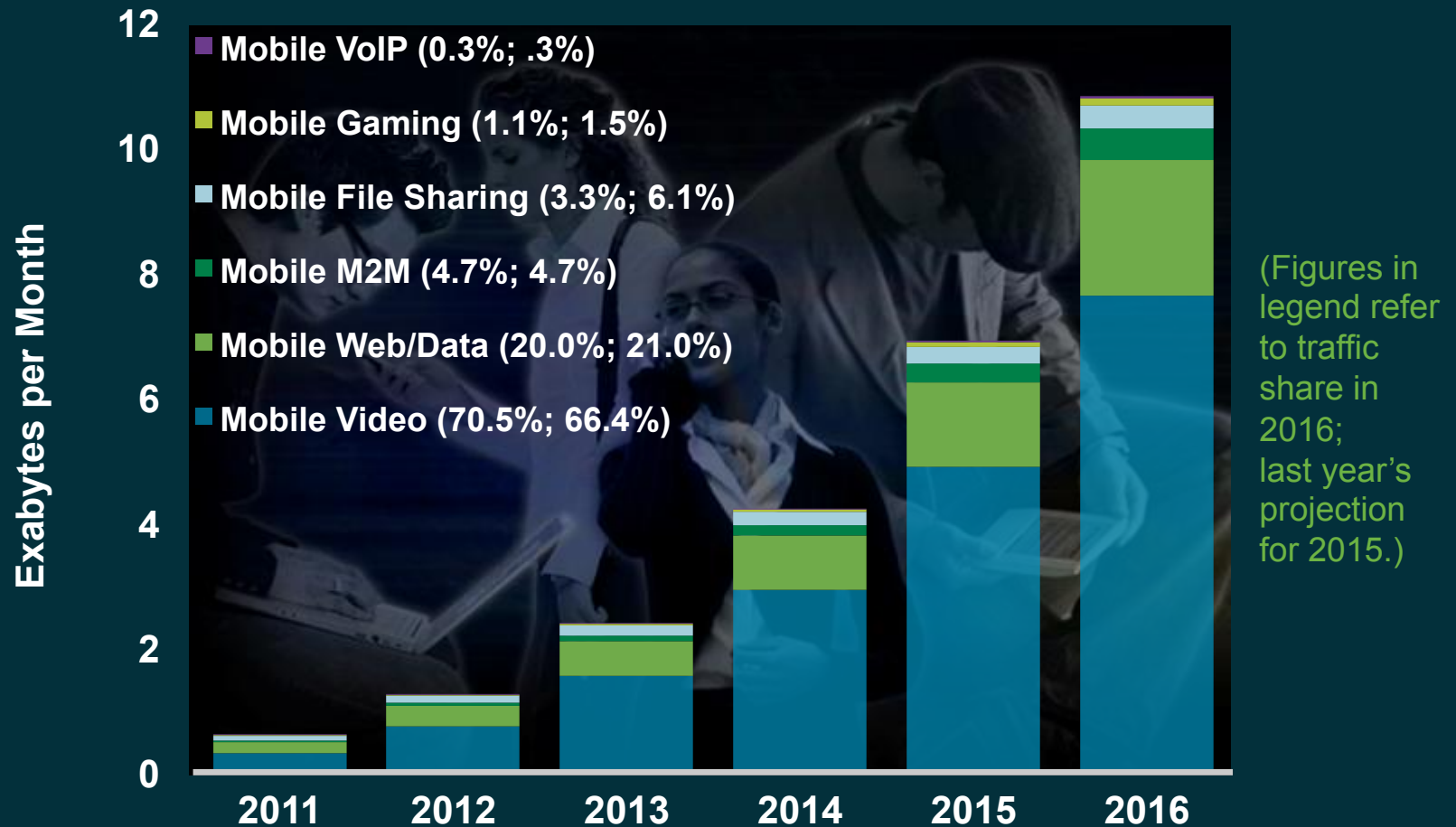
15%

24%

61%

Online Gaming and VoIP forecast to be 0.79% of all consumer Internet traffic in 2015

Source: Cisco Visual Networking Index (VNI) Global IP Traffic Forecast, 2010–2015

Global Mobile Data Traffic Growth / Apps
Video to Exceed 70 Percent of Mobile Data Traffic in 2016

Exabytes per Month

Legend:
- ■ Mobile VoIP (0.3%; .3%)
- ■ Mobile Gaming (1.1%; 1.5%)
- ■ Mobile File Sharing (3.3%; 6.1%)
- ■ Mobile M2M (4.7%; 4.7%)
- ■ Mobile Web/Data (20.0%; 21.0%)
- ■ Mobile Video (70.5%; 66.4%)

Y-axis: 0, 2, 4, 6, 8, 10, 12

X-axis: 2011, 2012, 2013, 2014, 2015, 2016

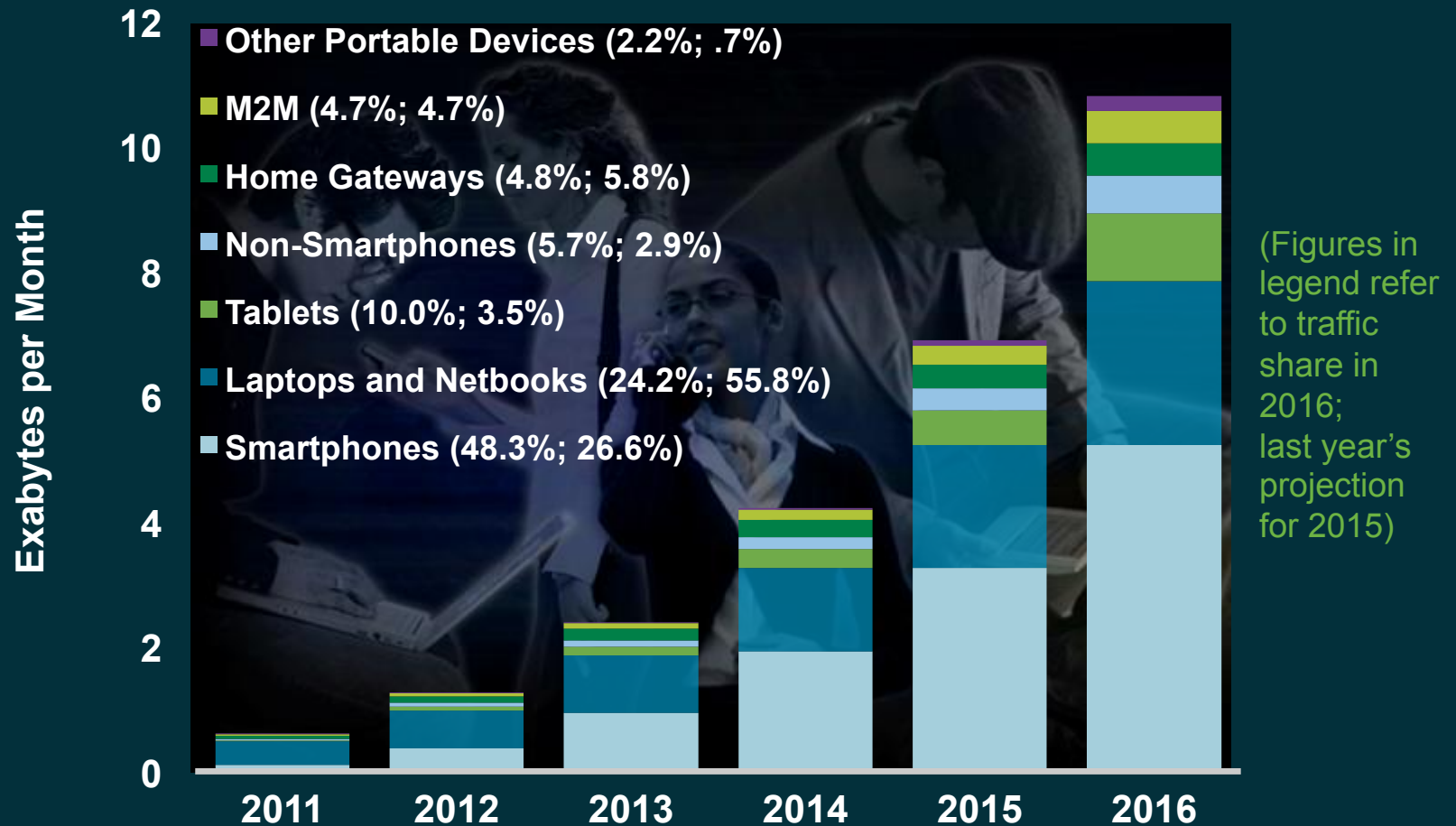(Figures in legend refer to traffic share in 2016; last year's projection for 2015.)

Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2011–2016

Global Mobile Data Traffic Growth / Devices
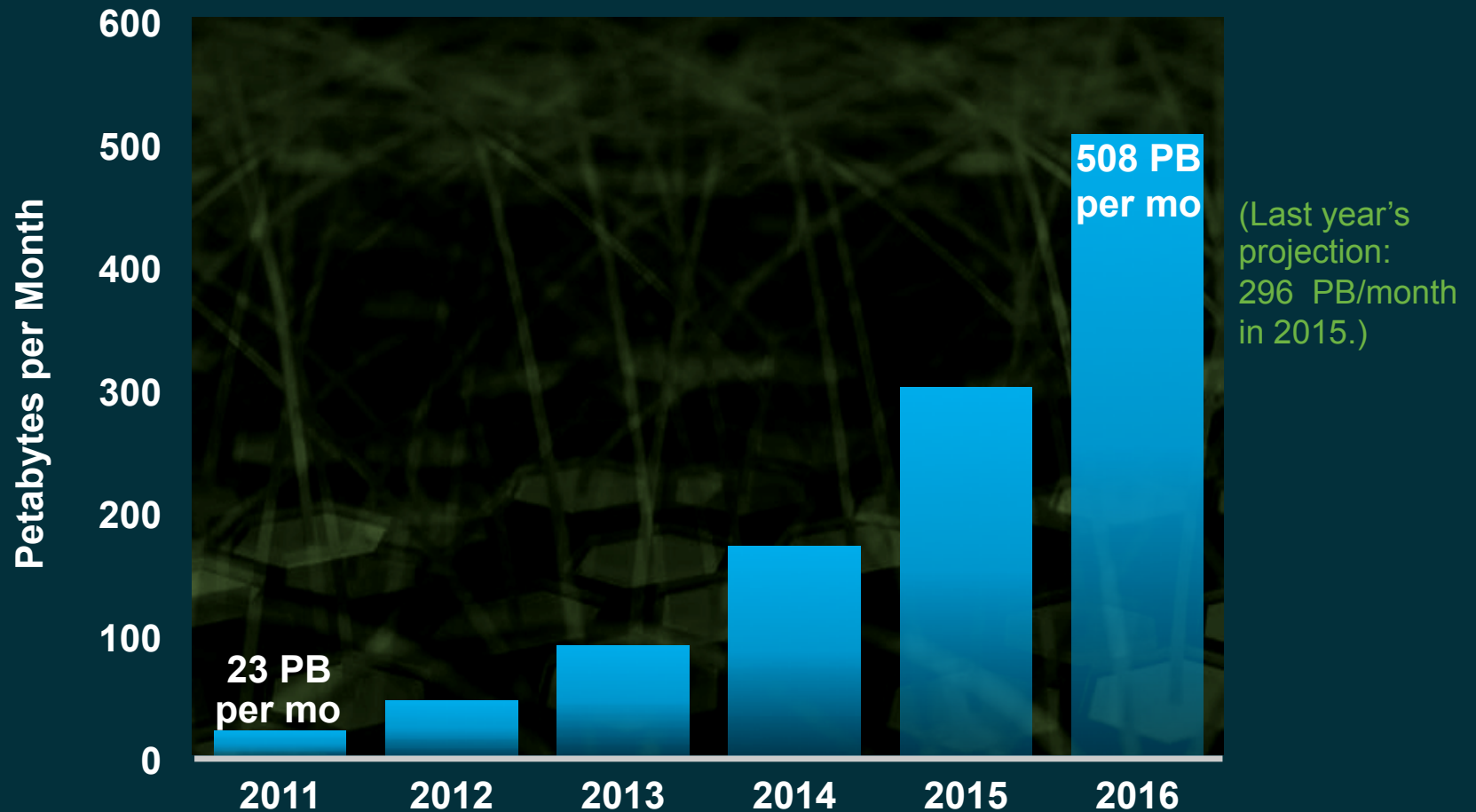## Laptops Dominate Today, but Smartphones Lead by 2016
Tablets Drive 10% of Traffic by 2016

Exabytes per Month

- **Other Portable Devices (2.2%; .7%)**
- **M2M (4.7%; 4.7%)**
- **Home Gateways (4.8%; 5.8%)**
- **Non-Smartphones (5.7%; 2.9%)**
- **Tablets (10.0%; 3.5%)**
- **Laptops and Netbooks (24.2%; 55.8%)**
- **Smartphones (48.3%; 26.6%)**

(Figures in legend refer to traffic share in 2016; last year's projection for 2015)

2011 2012 2013 2014 2015 2016

12
10
8
6
4
2
0

Machine-to-Machine Mobile Data Traffic Growth
M2M Data Traffic will Increase 22X from 2011 to 2016

Petabytes per Month

600
500
400
300
200
100
0

23 PB per mo (2011)

508 PB per mo (2016)

(Last year's projection: 296 PB/month in 2015.)

2011 2012 2013 2014 2015 2016

Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2011–2016

Global IPv6-Capable Mobile Devices
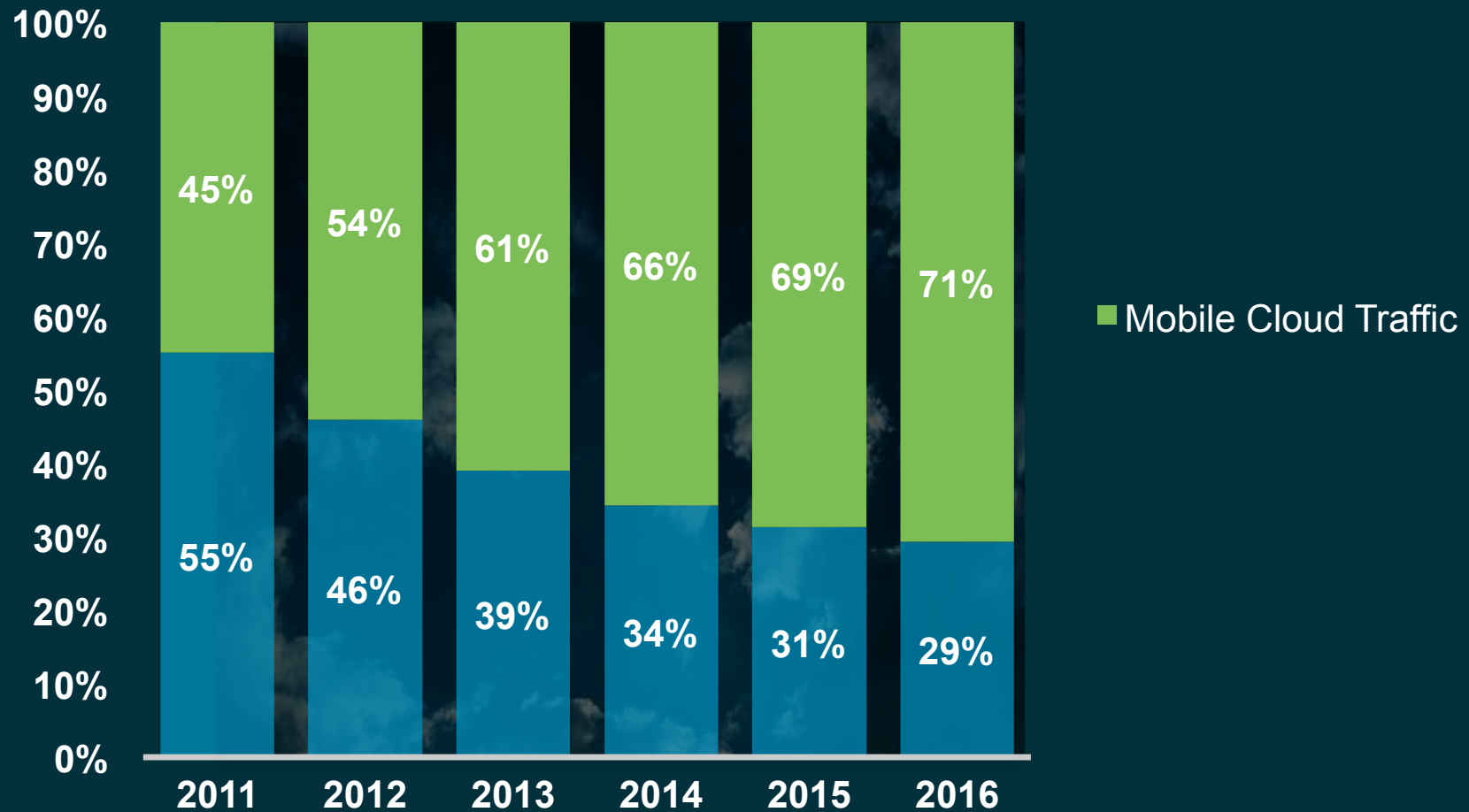## By 2016, 71% of All Smartphones/Tablets Will Be IPv6-Capable

Number of Devices (B)

- 2.0
- 1.5 — **1.62B**
- 1.0
- 0.5
- 0.0 — **280M**

2011   2012   2013   2014   2015   2016

Source: Cisco Visual Networking Index (VNI) Global Mobile Data Traffic Forecast, 2011–2016

Global Mobile Cloud Traffic
Cloud Accounted for 45% of Mobile Data Traffic in 2011
Cloud will Account for 71% of Mobile Data Traffic in 2016

Mobile Cloud Traffic

Year	Mobile Cloud Traffic	Non-Cloud
2011	45%	55%
2012	54%	46%
2013	61%	39%
2014	66%	34%
2015	69%	31%
2016	71%	29%

Global Cloud Readiness: Latency Matters
Business and Consumer Applications: Network Requirements

Basic Cloud Applications

Network Requirements:

Latency: Above 140 ms

- Text communications (email, instant messaging)
- Web browsing
- File sharing (low-resolution video)
- Web conferencing
- Social networking (basic text only)
- Stream basic video or music

Intermediate Cloud Applications

Network Requirements:

Latency: 140 - 50 ms

- File sharing (high-resolution video)
- IP Telephony
- ERP and CRM
- Basic gaming (single player)
- Basic video chat (low-resolution video)
- IP audio conferencing
- Basic video conferencing (low-resolution video)
- Advanced social networking (multimedia and interactivity)
- HD video streaming
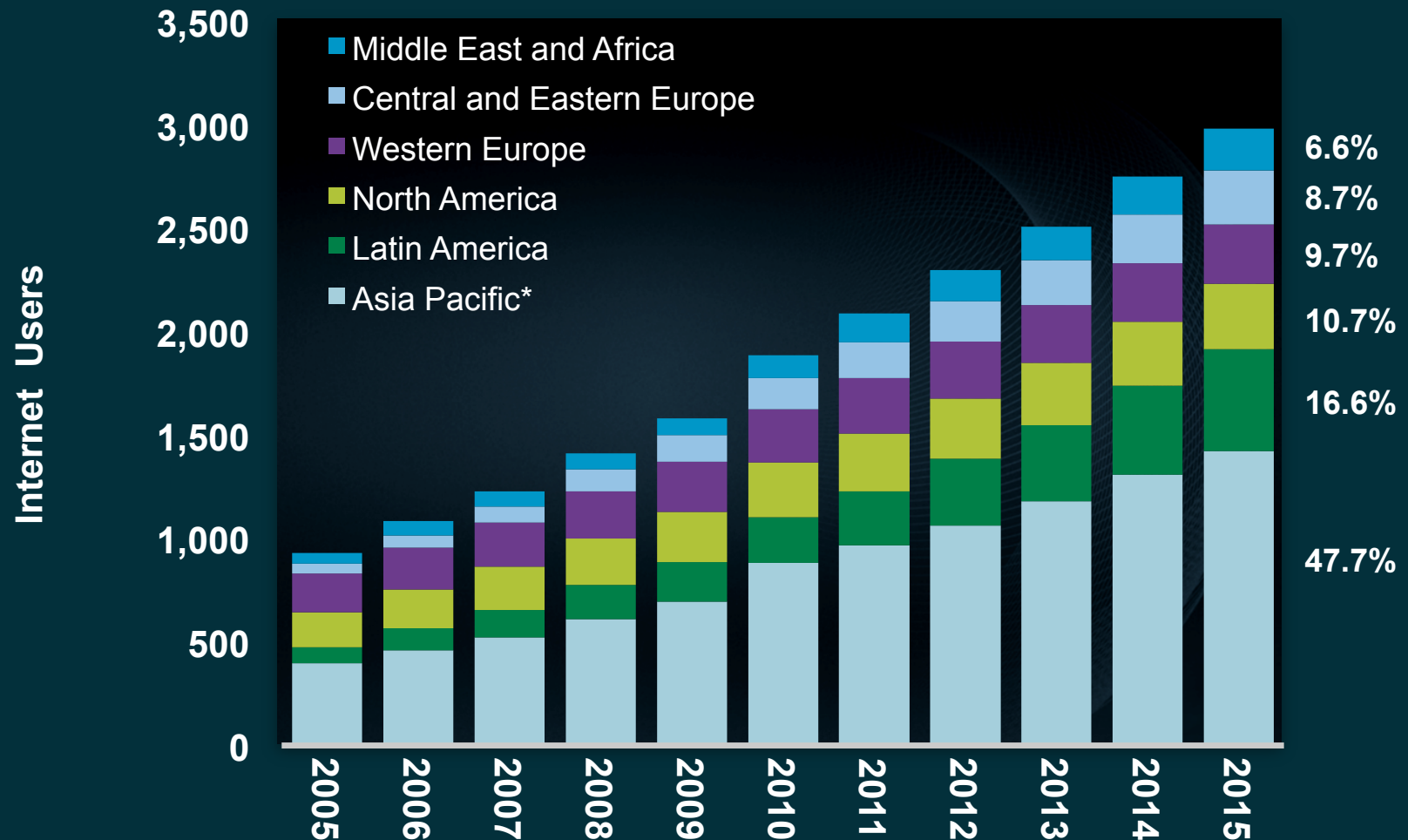
Advanced Cloud Applications

Network Requirements:

Latency: Less than 50 ms

- Advanced gaming (multi player)
- Advanced video chat (high-resolution video)
- Advanced file sharing (super high-resolution video)
- HD audio conferencing
- HD video conferencing (high-resolution video)
- Stream super HD video

Regional Internet Users
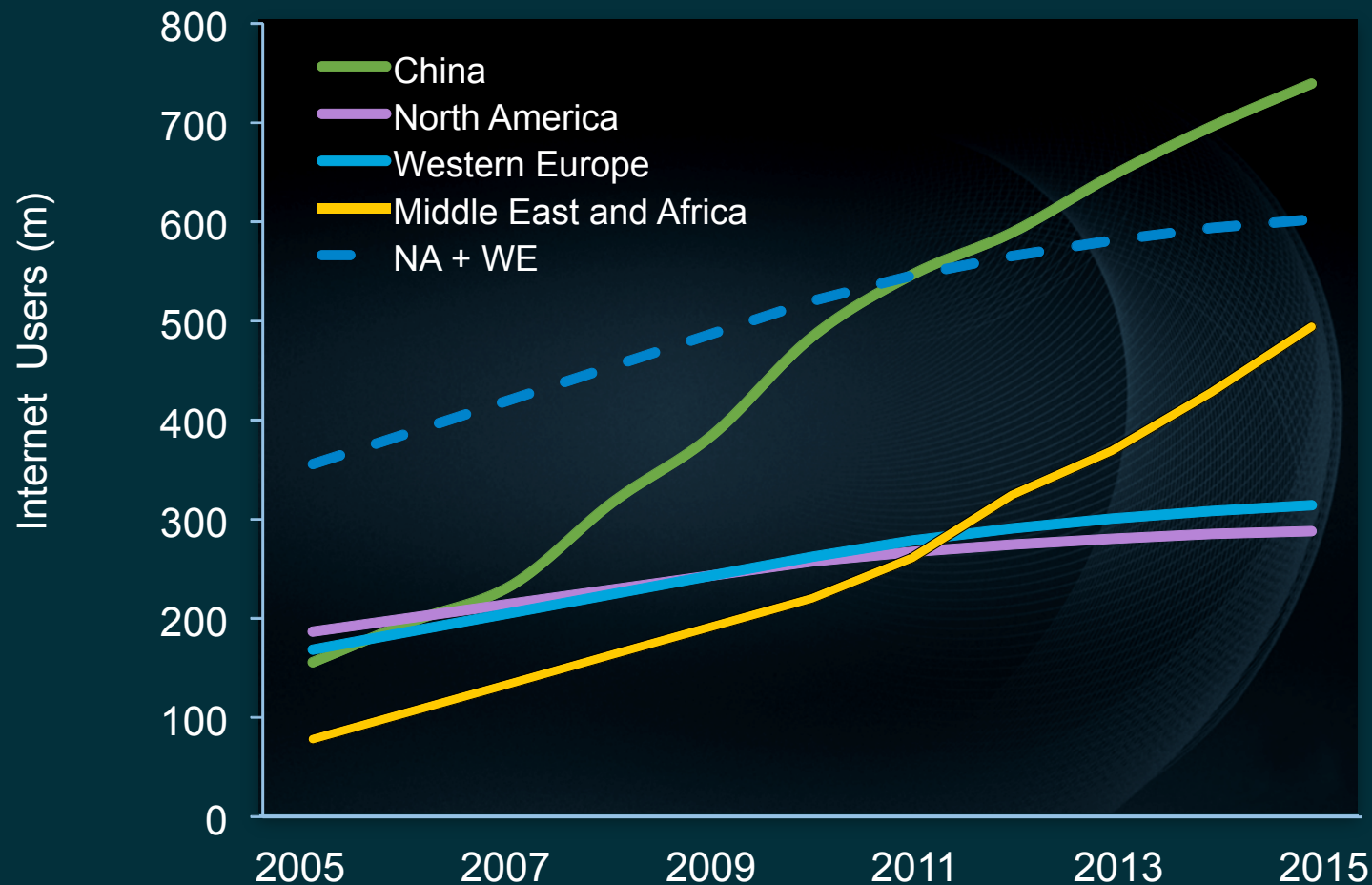## By 2015, APAC will have nearly half of global Internet Users

Internet Users (y-axis)

Legend:
- Middle East and Africa
- Central and Eastern Europe
- Western Europe
- North America
- Latin America
- Asia Pacific*

Years: 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015

2015 percentages:
- 6.6%
- 8.7%
- 9.7%
- 10.7%
- 16.6%
- 47.7%

Source: Cisco Visual Networking Index (VNI) Global IP Traffic Forecast, 2010–2015

*Asia Pacific includes Japan

Milestones: 2006 and 2012
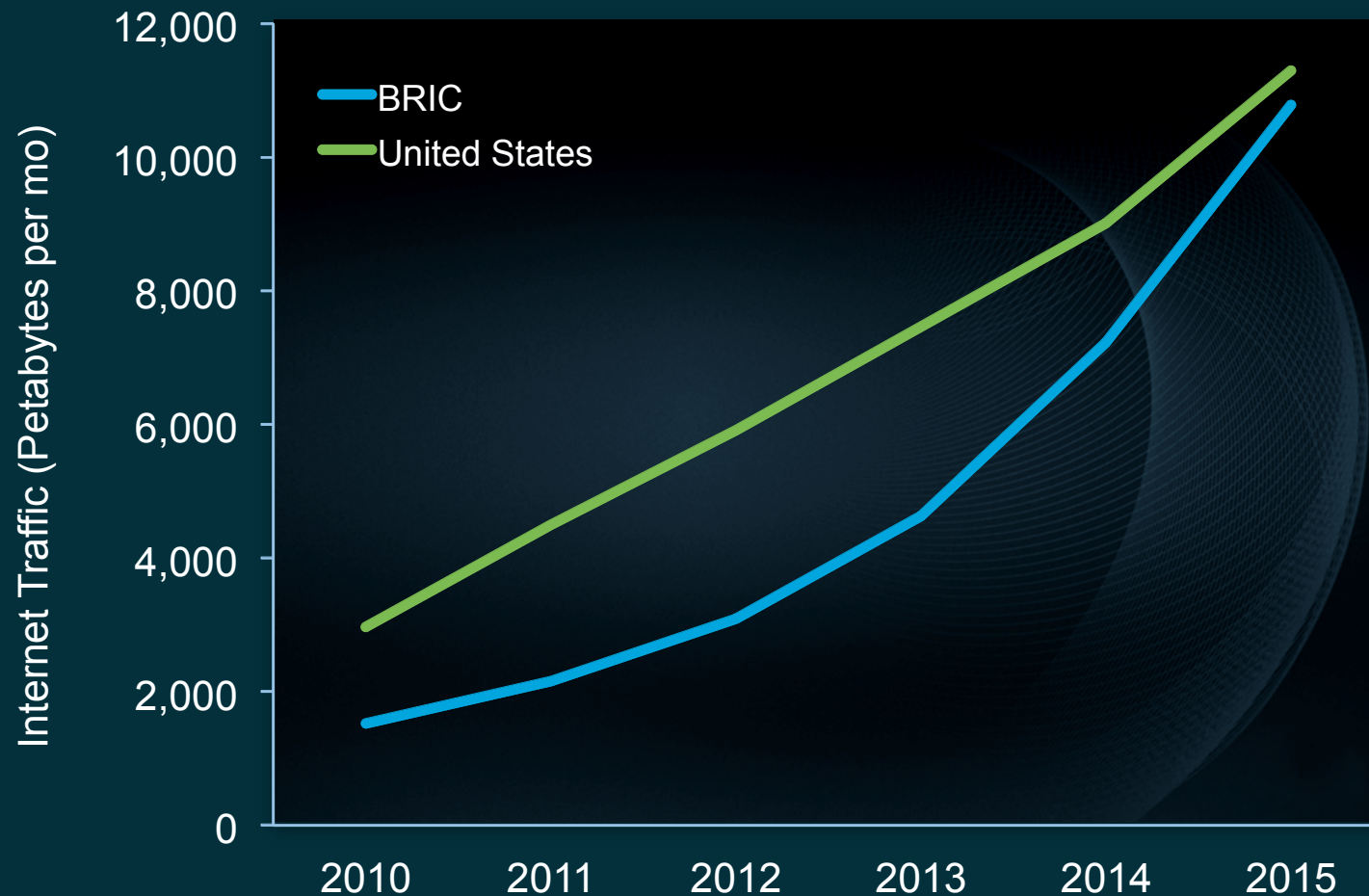In 2006, China surpassed both NA and WE in Internet Users
In 2012, China will surpass NA+WE and MEA will surpass NA and WE,

Milestones: 2015
In 2015, BRIC will nearly equal the US in Consumer Internet Traffic

US Share of Internet Traffic, Compared to China
China to reach 12% of total global Internet traffic in 2015

Share of Global Internet Traffic

- China
- United States

87%

0.4%

20%

12%

Summary

- Everybody and everything will be connected

- People and devices will be consuming/generating huge amounts of data—driven by video

- Most apps will reside in the cloud

- Latency matters

- Internet even more global

  Shift from West and North to East and South

Thank you.