NEWS RELEASE

Cisco Visual Networking Index (VNI) Mobile Forecast Projects Nearly 10-Fold Global Mobile Data Traffic Growth Over Next Five Years

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Smart Connections Will Account for 97 Percent of Global Mobile Traffic by 2019
SAN JOSE, CA -- (Marketwired) -- 02/03/15 -- Cisco (NASDAQ: CSCO) -- According to the latest annual update of the Cisco® Visual Networking Index™ (VNI) Global Mobile Data Traffic Forecast for 2014 to 2019, the ongoing adoption of more powerful mobile devices and machine-to-machine (M2M) connections combined with broader access to faster cellular networks are key contributors to significant mobile traffic growth. In 2014, 88 percent of global mobile data traffic was "smart" traffic, with advanced computing/multi-media capabilities and a minimum of 3G connectivity, but that figure is expected to rise to 97 percent by 2019.

The worldwide shift from basic-feature phones to smartphones -- combined with the continued growth in tablets, a resurgence in laptops with tablet-like capabilities as well as expanding machine-to-machine (M2M) applications -- are key factors supporting the increasing smart traffic trend. From a global mobile network perspective, 3G is expected to surpass 2G as the top cellular technology, based on connection share, by 2017. By 2019, 3G networks will support 44 percent of global mobile devices and connections; 4G networks will support 26 percent of connections, though will generate 68 percent of traffic.

In terms of topline traffic growth, the Cisco VNI Global Mobile Data Traffic Forecast projects that global mobile data traffic will reach an annual run rate of 292 exabytes by 2019, up from 30 exabytes in 2014. These predicted 292 exabytes would represent:

- 292 times more than all Internet Protocol (IP) traffic, fixed and mobile, generated in 2000; or
- 65 trillion images (e.g., multimedia message service or Instagram) -- 23 daily images per person on earth for a year; or
- 6 trillion video clips (e.g., YouTube) -- more than two daily video clips per person on earth for a year.

**An exabyte is a unit of information or computer storage equal to one quintillion bytes or one billion gigabytes.*

Key Global Mobile Data Traffic Drivers

From 2014 to 2019, Cisco anticipates that global mobile traffic growth will outpace global fixed traffic growth by a factor of three. Trends driving mobile data traffic growth include:

- ***More mobile users***: By 2019, there will be 5.2 billion mobile users (up from 4.3 billion in 2014). In 2014, nearly 59 percent of the world's population (7.2 billion people) was comprised of mobile users; by 2019, more than 69 percent of the world's population (7.6 billion people) will be mobile users.
- ***More mobile connections***: By 2019, there will be approximately 11.5 billion mobile-ready devices/connections, including 8.3 billion personal mobile devices and 3.2 billion M2M connections (up from 7.4 billion total mobile-ready devices and M2M connections in 2014).
- ***Faster mobile speeds:*** Average global mobile network speeds will increase 2.4 fold from 2014 (1.7 Mbps) to 2019 (4.0 Mbps).
- ***More mobile video:*** By 2019, mobile video will represent 72 percent of global mobile data traffic (up from 55 percent in 2014).

Impact of Mobile M2M Connections (and Wearable Devices)

M2M refers to applications that enable wireless systems to communicate with similar devices to support global positioning satellite (GPS) navigation systems, asset tracking, utility meters, security and surveillance video. Wearable devices are included as a sub-segment of the M2M connections category to help project the growth trajectory of the Internet of Everything (IoE).

- The number of wearable devices globally will grow five-fold, reaching 578 million by 2019, up from 109 million in 2014, with the majority of devices anticipated in North America and Asia Pacific.
- This is expected to fuel 18-fold growth in mobile traffic from wearable devices between 2014 and 2019, with most of it channeled through smartphones.
- In 2014, the average wearable device generated 6X more traffic per month than a basic handset (wearables = 141 MBs mobile traffic/month vs. basic handsets = 22 MBs mobile traffic/month).
- As an example of a high-end wearables use case, livestreaming of a GoPro video camera on a cellular network would generate about 5 MB of mobile data traffic per minute.
- In 2014, the average M2M module generated three-times more traffic per month than a basic handset (M2M = 70 MB of mobile traffic/month vs. basic handsets = 22 MB of mobile traffic/month).

Increase in 4G Connectivity

Many global service providers are deploying 4G technologies to address consumer and business users' strong demand for wireless services and content. In many emerging markets, service providers are creating new mobile infrastructures with 4G solutions. In some mature markets, service providers are supplementing or replacing legacy 2G or 3G solutions with 4G technologies.

- 26 percent of all global devices and connections will be 4G capable by 2019.
- The number of 4G connections globally will grow 18-fold, from 459 million in 2019 to 3 billion by 2019.
- By 2017, 3G will surpass 2G as the top cellular technology based on connection share.
- In 2014, 4G connections accounted for 40 percent of total mobile data traffic; by 2019, 4G connections will account for 68 percent of total mobile data traffic.
- In 2014, the average 4G connection generated 2.2 GB of mobile data traffic per month; by 2019, the average 4G connection will generate 5.5 GB of mobile data traffic per month, 5.3X higher than the 1.04 GB/month for the average non-4G connection.

Wi-Fi Offload Traffic Surpasses Cellular Traffic
"Offload" refers to traffic from dual mode devices and supports cell and Wi-Fi connectivity, excluding laptops, over Wi-Fi and small cell networks. Offloading occurs at the user or device level when one switches from a cell connection to Wi-Fi and small cell access. The Cisco VNI Global Mobile Data Traffic Forecast (2014-2019) mobile offload projections include traffic from public hotspots and residential Wi-Fi networks.

- In 2014, 46 percent of total mobile data traffic was offloaded; by 2019, 54 percent of total mobile data traffic will be offloaded.
- Without offload, the 2014 - 2019 global mobile data traffic compound annual growth rate (CAGR) for global mobile data traffic would be significantly higher (65 percent instead of 57 percent).

Voice-over-Wi-Fi (VoWi-Fi) Surpasses Voice-over-LTE (VoLTE)
Given the growth and strategic mobile networking role of Wi-Fi technologies, this year's study includes an analysis of VoWi-Fi compared to other mobile voice services. VoWi-Fi is not new, but earlier solutions had limitations that affected adoption and end-user experiences. Carrier-grade VoWi-Fi offers are now being introduced, which can be delivered to non-SIM devices, such as Wi-Fi only tablets. VoWi-Fi has the potential for significant growth over the next five years.

- By 2017, VoWi-Fi traffic (10.8 PB/year) will exceed VoLTE traffic (10.7 PB/year).
- By 2018, VoWi-Fi will exceed VoLTE in the number of minutes used per year.
- By 2019, VoWi-Fi minutes of use will account for more than half -- 53 percent -- of all mobile IP voice traffic.
- By 2019, the number of Wi-Fi-capable tablets and PCs (1.9 billion) will be nearly 3.5-times the number of cellular-capable tablets and PCs (542 million).

Growth of Mobile Cloud Traffic
Cloud applications and services such as Netflix, YouTube, Pandora, and Spotify allow mobile users to overcome the memory capacity and processing power limitations of mobile devices.

- Mobile cloud traffic will grow nearly 11-fold from 2014 (2 exabytes/month) to 2019 (21.8 exabytes/month).
- In 2014, cloud applications accounted for 81 percent of total mobile data traffic; by 2019, cloud applications will account for 90 percent of total mobile data traffic.

Key Regional Growth Projections
In terms of mobile data traffic growth rates over the forecast period, the Middle East and Africa region is projected to have the highest regional growth rate. Below is how each of the regions ranks in terms of *growth rate* by 2019:

1. The Middle East and Africa will have a 72 percent CAGR and 15.3-fold growth
2. Central and Eastern Europe will have a 71 percent CAGR and 14.4-fold growth
3. Asia-Pacific will have a 58 percent CAGR 9.7-fold growth
4. Latin America will have a 59 percent CAGR and 10.1-fold growth
5. North America will have a 47 percent CAGR and 6.8-fold growth
6. Western Europe will have a 48 percent CAGR and 7.1-fold growth

In terms of mobile data traffic generation, the Asia-Pacific region is projected to generate the most mobile data traffic. Below is how each of the regions ranks in terms of anticipated mobile data *traffic generation* by 2019:

1. Asia-Pacific: 9.5 exabytes per month by 2019
2. North America: 3.8 exabytes per month by 2019

3. Western Europe: 2.4 exabytes per month by 2019
4. Central and Eastern Europe: 3.5 exabytes per month by 2019
5. The Middle East and Africa: 3.0 exabytes per month by 2019
6. Latin America: 2.0 exabytes per month by 2019

Cisco Mobile VNI Forecast Methodology
The Cisco VNI Global Mobile Data Traffic Forecast (2014-2019) relies upon independent analyst forecasts and real-world mobile data usage studies. Upon this foundation are layered Cisco's own estimates for mobile application adoption, minutes of use and transmission speeds. Key enablers such as mobile broadband speed and device computing power are also factored into Cisco mobile VNI projections and findings. A detailed methodology description is included in the complete report (see link below).

Supporting Quote

- ***Doug Webster, Vice President of Service Provider Products and Solutions Marketing, Cisco***

"The ongoing adoption of more powerful mobile devices and wider deployments of emerging M2M applications, combined with broader access to faster wireless networks, will be key contributors to significant mobile traffic growth in the coming years. This mobile-centric environment will give service providers a new landscape of challenges and opportunities to innovatively deliver a variety of mobile services and experiences to consumers and business users as the Internet of Everything (IoE) continues to take shape."

Images and Video

- Global Mobile Data Traffic Drivers
- Global Mobile Data Traffic Growth -- Top Line
- Infographic: Cisco Visual Networking Index Global Mobile Data Traffic Forecast Update (2014-2019)
- Video: Number of Mobile Devices and Connections

Additional Supporting Resources

- Cisco Visual Networking Index home page
- Cisco Visual Networking Index Mobile Data Traffic blog post: "Cisco VNI Global Mobile Data Traffic Forecast Update (2014-2019)"
- Read the complete Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2014-2019 white paper.
- Cisco Visual Networking Index: Global Mobile Data Traffic Forecast, 2014-2019
- Learn more about the free Cisco Visual Networking Index resources
- See the latest Cisco Data Meter results worldwide: http://ciscovni.com/data-meter/index.html
- Follow us on our LinkedIn page for targeted updates and announcements
- For more information about Cisco's service provider news and activities visit the SP360 Blog or follow us on Twitter @CiscoVNI.
- Cisco Service Provider SlideShare presentations
- Cisco Service Provider Mobility Community
- Subscribe to Cisco's SP360 feed
- See how the rapid evolution of mobile services to a virtualized cloud environment creates more than $500B in new opportunity by 2019. You can find out more using our Monetization and Optimization Index (MOI). And you can use it to forecast your specific market in cloud, mobile or video services.

Cisco VNI Global Mobile Data Traffic Forecast Update Webcast
Cisco invites press, analysts and bloggers to attend a webcast featuring Cisco executives talking about the global impact of mobile data traffic growth for service providers, organizations and consumers. The pre-recorded webcast begins at 8:00 a.m. (PST) today and can be accessed by registering at Cisco VNI Global Mobile Data Traffic Forecast Update (2014-2019).

Editor's Notes
Cisco also welcomes press, analysts, bloggers, service providers, regulators and other interested parties to use and reference our research with proper attribution, such as "Source: Cisco Visual Networking Index Global Mobile Data Traffic Forecast Update, 2014-2019."

Cisco defines the following terms:

- ***Cellular Traffic***: comes from a cellular or radio network connection -- 2G, 3G and 4G.
- ***Wi-Fi Offload Traffic***: refers to traffic from dual mode devices (supports cell and Wi-Fi connectivity; excluding laptops) over Wi-Fi/small cell networks. Offloading occurs at the user/device level when one switches from a cellular connection to Wi-Fi/small cell access.
- ***Fixed/Wi-Fi Traffic***: comes from a wireless connection enabled by some fixed network source, such as a residential Wi-Fi router or public hotspot.

Tags/Keywords
Cisco, Service Provider, Visual Networking Index, VNI, Mobile Internet, Mobile Data, Mobile Video, Mobile VNI, Doug Webster

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