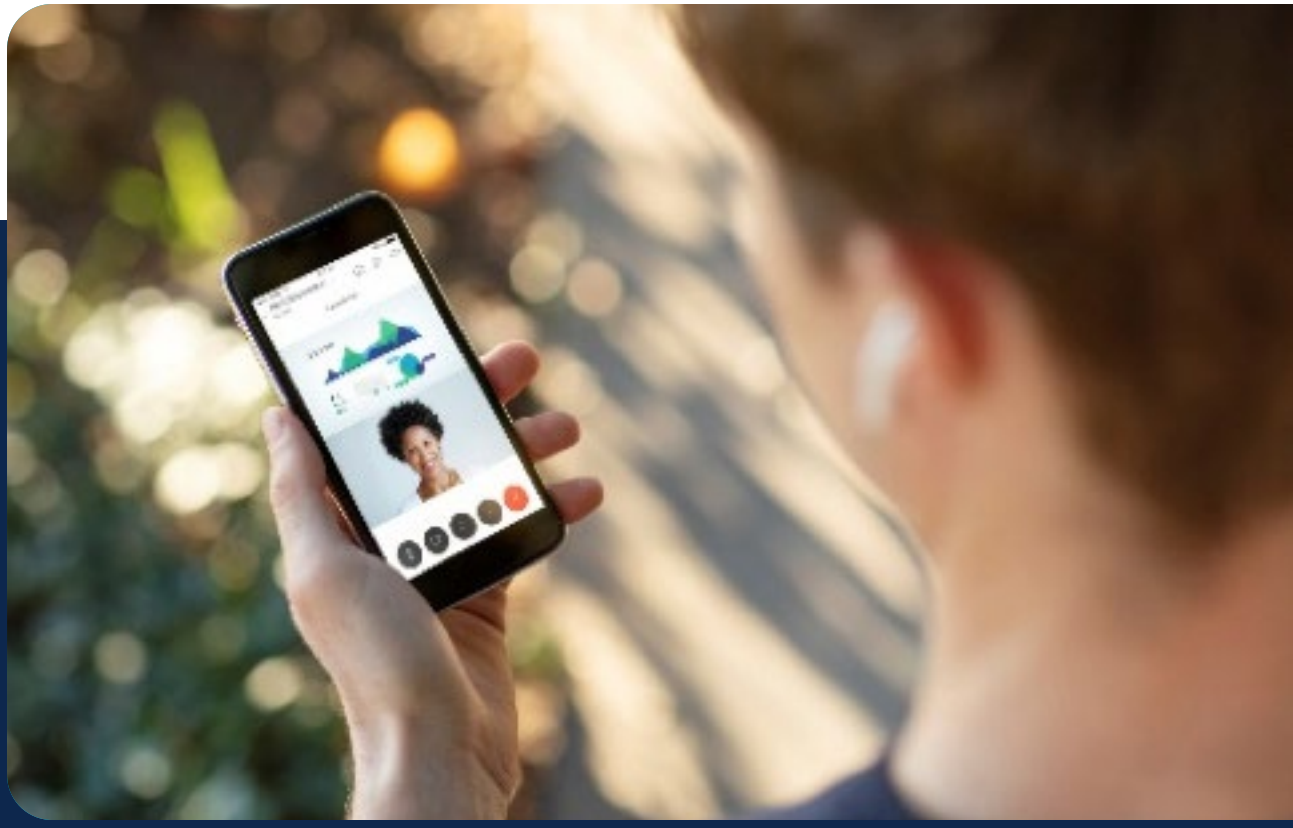
Mobility: Transforming the Internet for the future



Mobile technologies are transforming how we use the Internet to live, work, play, and learn. Access-technology innovations like 5G and Wi-Fi 6 give mobile subscribers better coverage, faster speeds, and lower latencies for better wireless experiences. Mobile advancements are also laying the foundation for a new era of tactile Internet applications and Internet of Things (IoT) development. This executive summary highlights mobile insights and projections from the *Cisco Annual Internet Report* and provides links to Cisco's mobile solutions that can support your business and networking strategies.

Global mobile users

Globally, the total number of mobile subscribers (those subscribing to a cellular service) will grow from 5.1 billion in 2018 to 5.7 billion by 2023. This represents 66 percent of the global population in 2018 and 71 percent of the global population by 2023. On a regional basis, North America and Western Europe will have the highest mobile adoption (as a percentage of regional population—see table 1). The fastest mobile growth will occur in the Middle East and Africa.

Table 1. Mobile subscribers as a percentage of regional population

Region	2018	2023
Global	66%	71%
Asia Pacific	65%	72%
Central and Eastern Europe	79%	81%
Latin America	75%	78%
Middle East and Africa	53%	57%
North America	86%	88%
Western Europe	84%	85%

Source: *Cisco Annual Internet Report*

By 2023, 71% of the global population will have a mobile subscription.

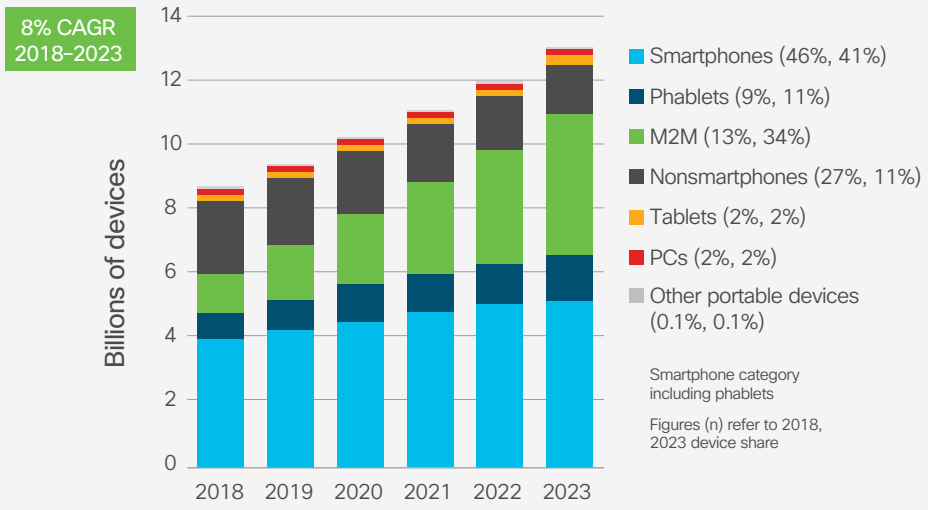
88% **of the North American population** will have a mobile subscription by 2023.

The mobile subscription rate in the Middle East and Africa will grow at a 4% **compound annual growth rate (CAGR) from 2018 to 2023.**

Global mobile devices and connections

The evolving mix and growth of wireless devices that access mobile networks is one of the primary contributors to global mobile traffic growth. Each year, new devices in different form factors with advanced capabilities and intelligence are introduced in the market. Recently, we have seen a rise of "phablets" and many new machine-to-machine (M2M) connections. By 2023, there will be 13.1 billion global mobile devices and connections (up from 8.8 billion in 2018). Figure 1 provides details on the composition of global mobile devices and connections.

Figure 1. Global mobile device and connection growth



Source: *Cisco Annual Internet Report*

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Mobile device and connection trends:

- By 2023, there will be 8.7 billion handheld or personal mobile-ready devices and 4.4 billion M2M connections.
- Mobile M2M connections enable a broad range of IoT applications and will represent 34 percent of global mobile devices and connections by 2023.
- Smartphones, including phablets, will increase from 4.9 billion in 2018 to 6.7 billion by 2023, representing 51 percent of global mobile devices and connections.
- North America and Western Europe will have the fastest growth in mobile devices and connections with 16 percent and 11 percent CAGR, respectively, from 2018 to 2023.

5G adoption and impact

Mobile devices are evolving from lower-generation network connectivity (2G) to higher-generation network connectivity (3G, 3.5G, 4G or LTE, and now 5G). Combining device capabilities with faster, higher-bandwidth, and more intelligent networks will facilitate broad experimentation and adoption of advanced multimedia applications. The phenomenal growth in mobile applications and the expanded reach of mobile connectivity to a growing number of end users has prompted the need for optimized bandwidth management and new network monetization models to sustain a maturing mobile industry. In a highly competitive mobile market, we have seen the growth of global 4G deployments as well as early-stage 5G implementations. Table 2 provides details on the global and regional share of mobile connections by network type.

Table 2. Network generation distribution

	3G and Below	4G	5G	LPWA*
% share				
Global				
Global	29%	46%	11%	14%
By region				
North America	1%	45%	17%	37%
Western Europe	13%	43%	16%	28%
Central and Eastern Europe	31%	50%	2%	16%
Asia Pacific	23%	52%	13%	12%
Latin America	37%	50%	7%	6%
Middle East and Africa	73%	22%	1%	4%

* Low-Power Wide-Area (LPWA) is an ultra-narrowband wireless network meant specifically for M2M modules that require low bandwidth and wide geographic coverage.

Source: *Cisco Annual Internet Report*

5G connectivity will emerge from trial phase to commercial availability driven by mobile IoT growth.

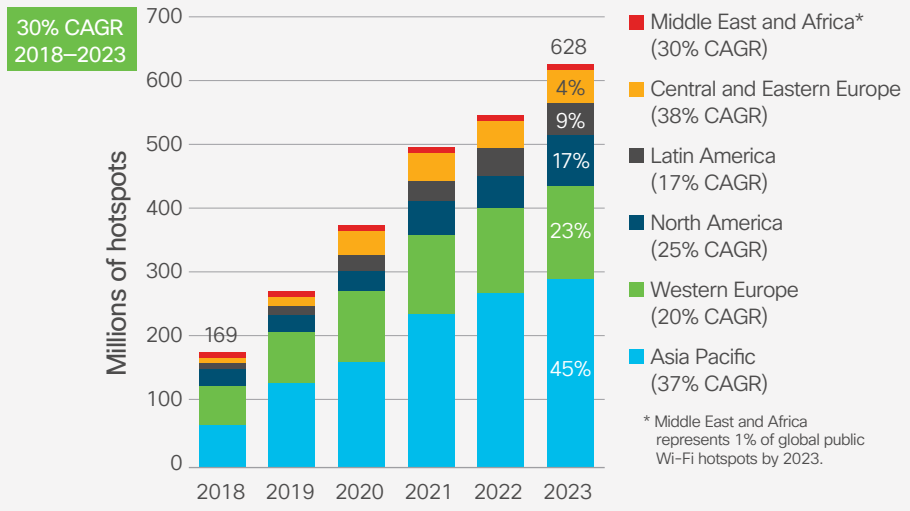
Cellular networking trends:

- By 2023, 11 percent of global mobile devices and connections will be supported by 5G.
- 4G will be the predominant mobile network connectivity from 2018 to 2023. By 2023, 4G connections will be 46 percent of total mobile connections, compared to 42 percent in 2018.
- Globally, mobile M2M connections will grow from 1.2 billion in 2018 to 4.4 billion by 2023 (fourfold growth).
- By 2023, 5G speeds will reach 575 Mbps—13x faster than the average mobile connection.

Wi-Fi 6 adoption and impact

Wi-Fi upgrades (Wi-Fi 6) are driven by our insatiable demand for wireless connectivity. A significant amount of cellular traffic is offloaded to Wi-Fi networks. The latest standards, Wi-Fi 6 and Wi-Fi 5, serve as a necessary complement to cellular networks and can enable higher-definition video streaming and services that require higher data rates. Figure 2 provides details on the global and regional share of public Wi-Fi hotspots.

Figure 2. Global public Wi-Fi hotspots growth by region



Source: *Cisco Annual Internet Report*

The Asia Pacific region is expected to experience the highest Wi-Fi speeds, at 116.1 Mbps, by 2023.

Wi-Fi trends:

- An important factor in the use of Wi-Fi technology is the number and availability of hotspots. By 2023, there will be 628 million global public Wi-Fi hotspots, 4x more than in 2018 (169 million).
- Total Wi-Fi homespots will grow fourfold from 2018 to 2023, from 159.4 million in 2018 to 616.7 million by 2023.
- Globally, Wi-Fi 6 hotspots will grow 13-fold from 2020 to 2023 and will be 11 percent of all public Wi-Fi hotspots by 2023.
- Globally, Wi-Fi connection speeds originated from dual-mode mobile devices will triple by 2023. The average Wi-Fi network connection speed (30.8 Mbps in 2018) will exceed 91.6 Mbps by 2023.

Build and enhance your mobile strategy and tactical plan with Cisco.

Bring your mobile strategies into the future—take full advantage of all our tools and resources so you can stay ahead of all the trends. Big changes are coming to connectivity. Become the ones leading those changes.

Learn more from the full *Cisco Annual Internet Report*.

Explore global and regional mobile trends from the Cisco Annual Internet Report Highlights Tool.

Compare global-, regional-, and country-level network performance with the Cisco Internet Readiness Tool.

Learn more about the role Cisco will play in empowering global 5G networks.

Learn more about Cisco's Wi-Fi 6 solutions.