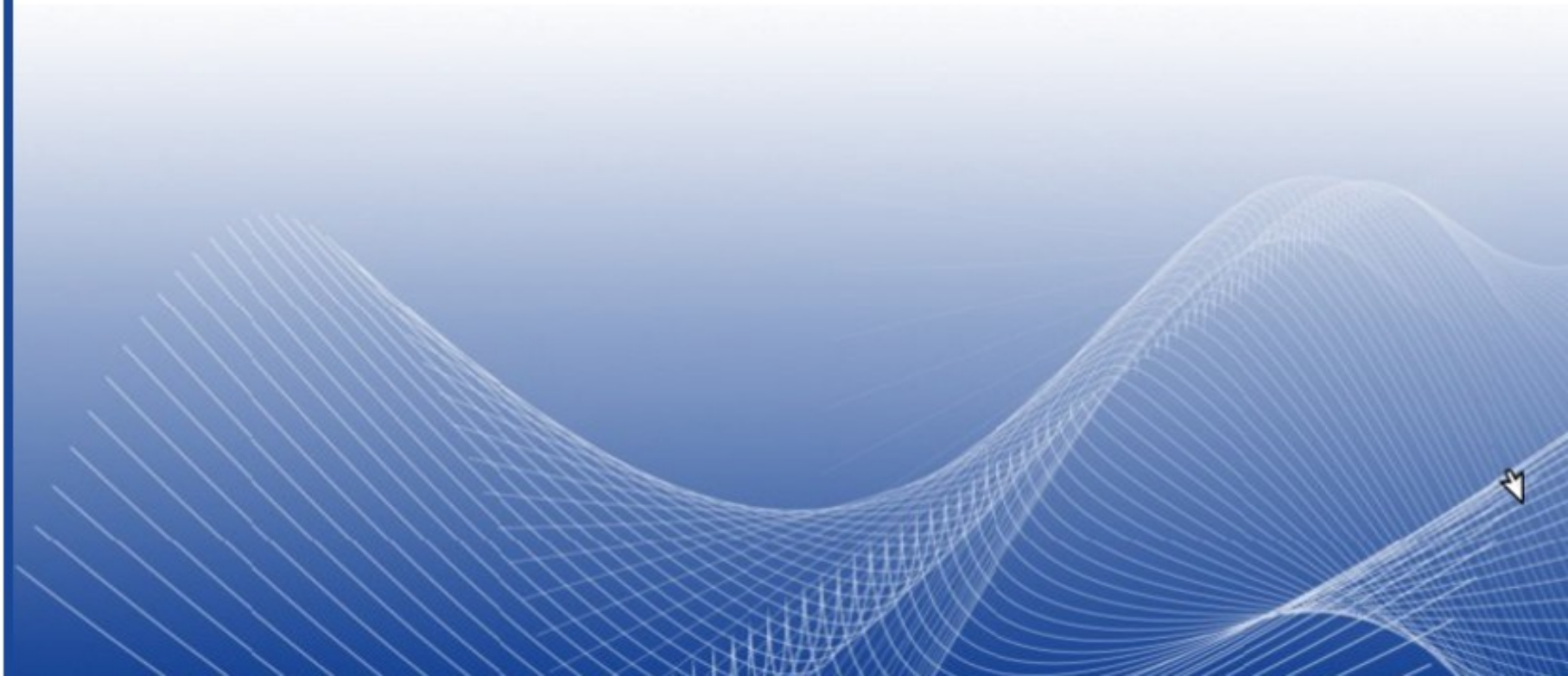
Networking Trends

Arquitetura de Redes Avançadas



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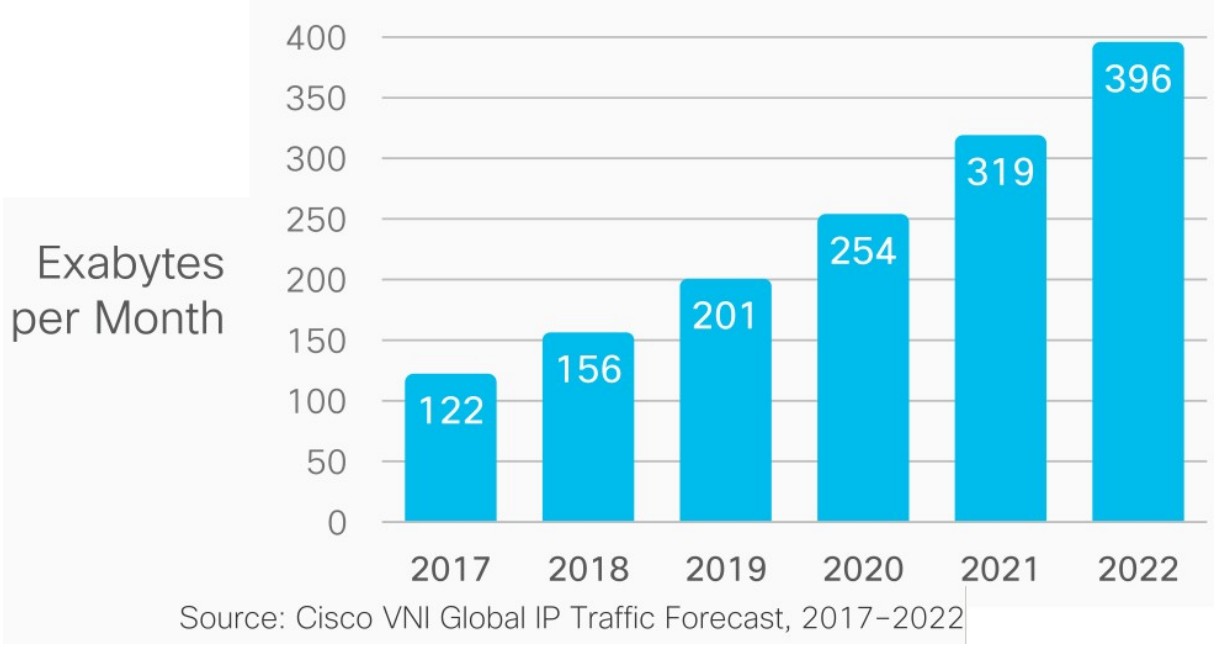
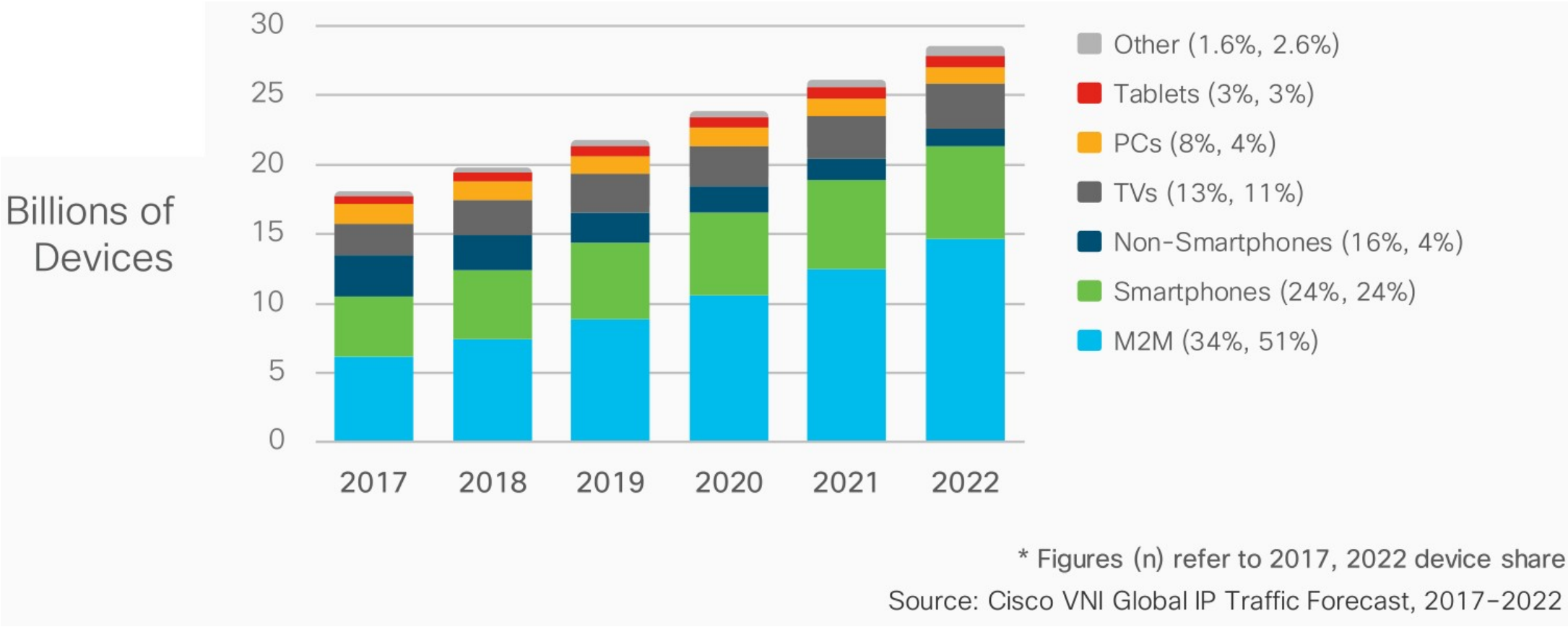
Global IP Traffic

- Total Internet traffic has experienced dramatic growth in the past two decades.
  - More than 20 years ago, in 1992, global Internet networks carried approximately 100 GB of traffic per day.
  - Ten years later, in 2002, global Internet traffic amounted to 100 gigabytes per second (GBps).
  - In 2014, global Internet traffic reached 16,144 GBps.
- Nearly triple from 2014 to 2019.
  - Globally, IP traffic will reach 22 GB per capita by 2019.



Source: Cisco VNI Global IP Traffic Forecast, 2017–2022

Global Devices Growth

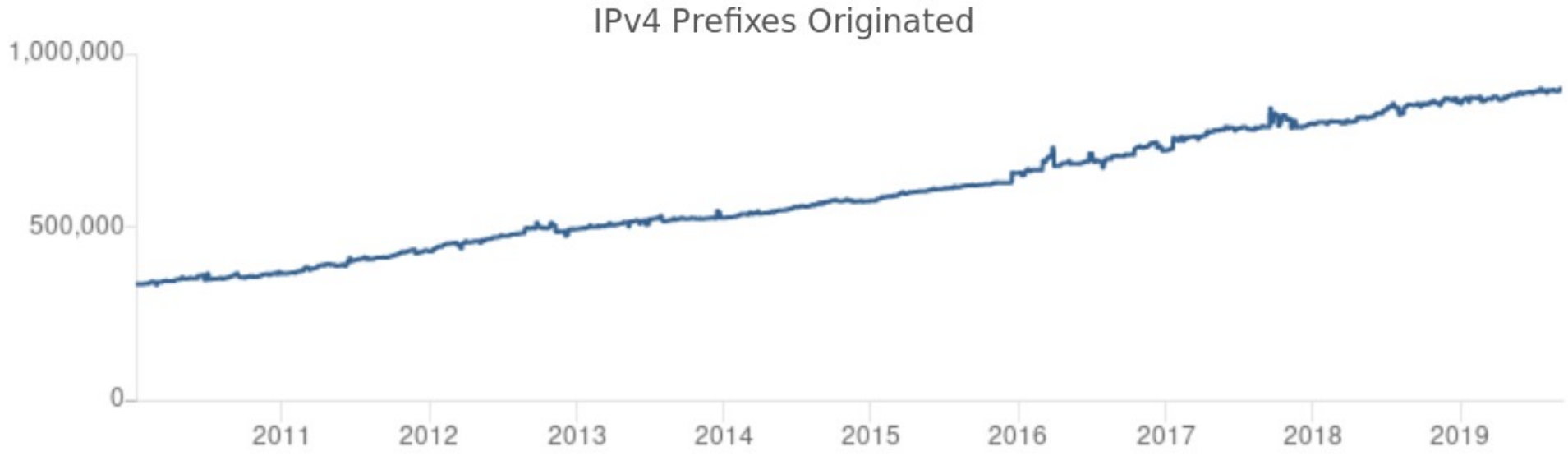


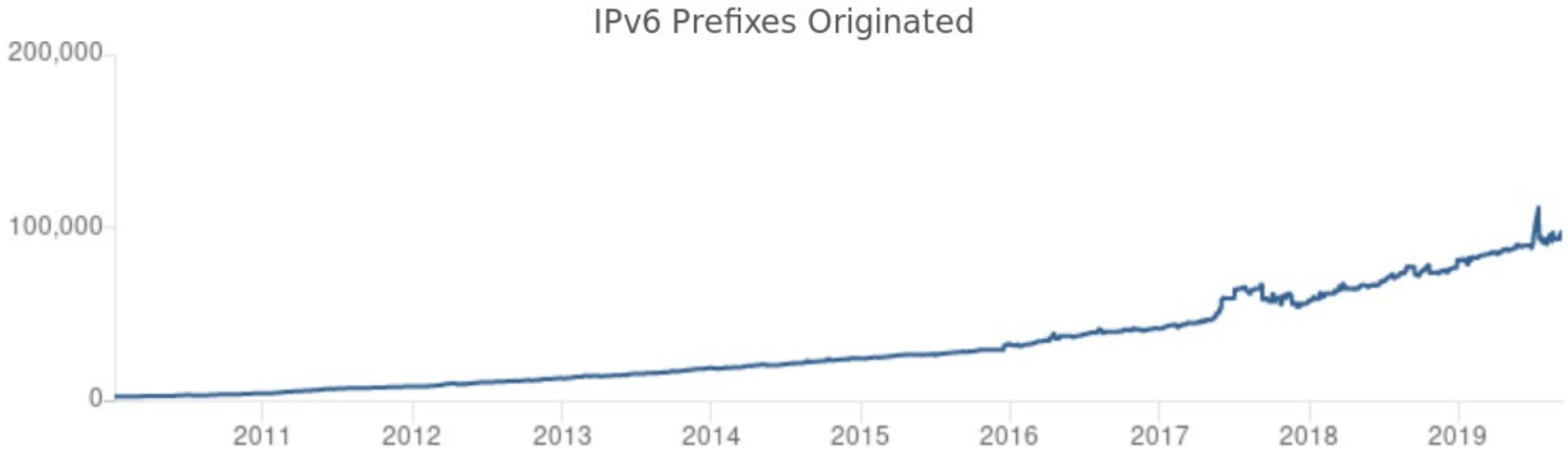
* Figures (n) refer to 2017, 2022 device share

Source: Cisco VNI Global IP Traffic Forecast, 2017–2022

- Device numbers are growing faster than both the population and Internet users.
- By 2022, M2M connections will be 51 percent of the total devices and connections.
  - Smart meters, video surveillance, healthcare monitoring, transportation, and package or asset tracking.

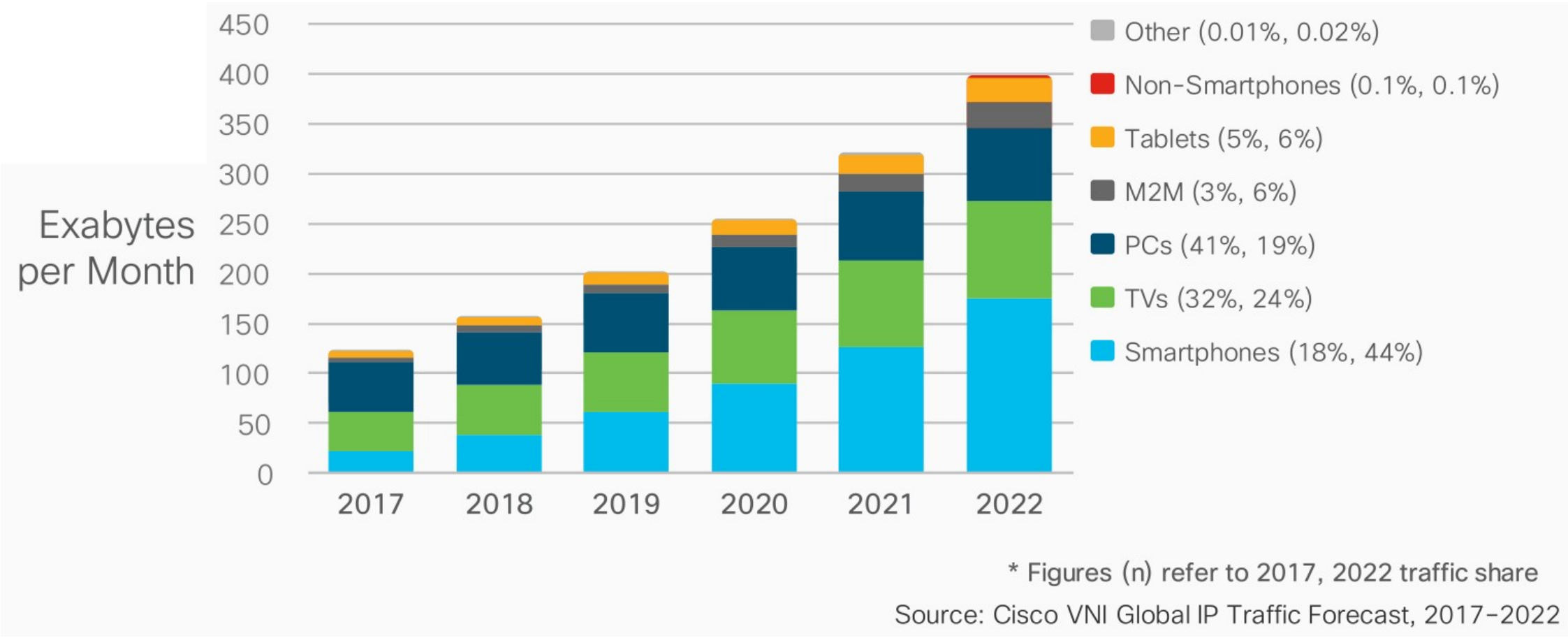
IPv4/IPv6 Prefixes





Updated 10 Sep 2019 20:45 PST © 2019 Hurricane Electric

Global IP Traffic by Devices



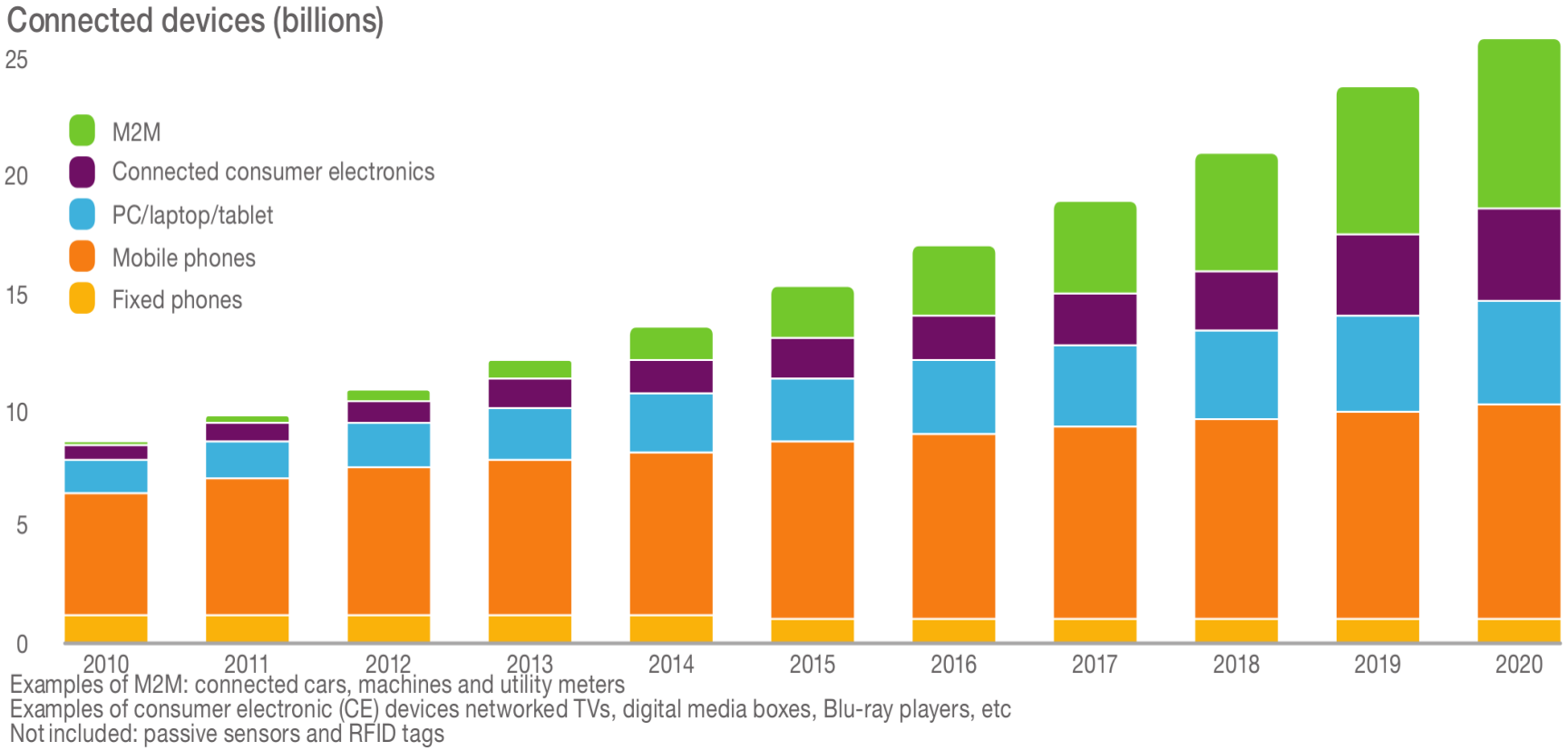
* Figures (n) refer to 2017, 2022 traffic share

Source: Cisco VNI Global IP Traffic Forecast, 2017–2022

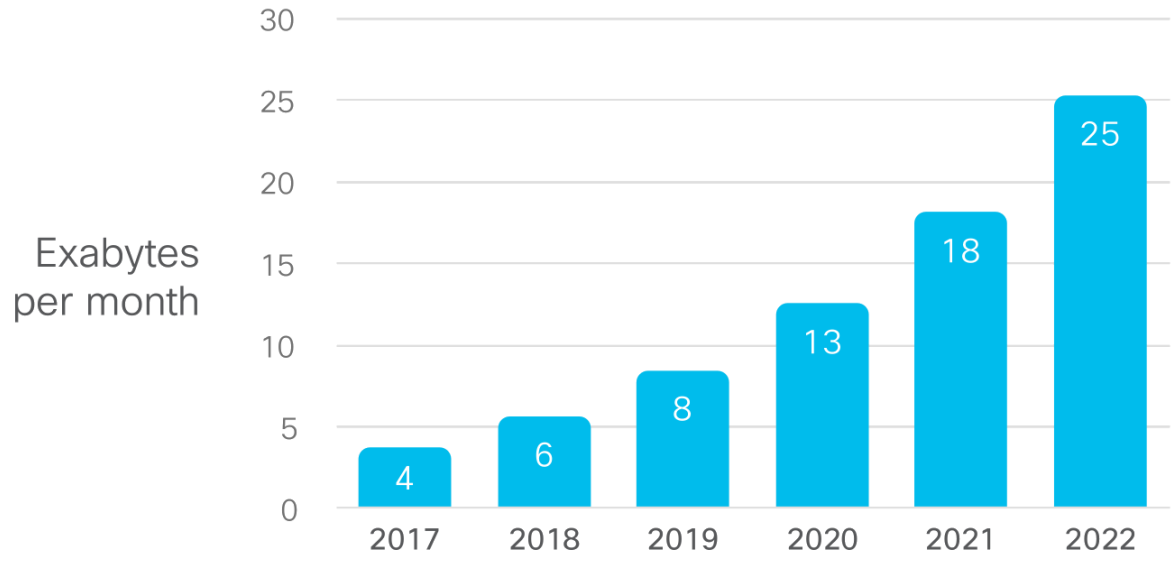
- At the end of 2017, 59 percent of IP traffic originated from non-PC devices.
- By 2022, 81 percent of IP traffic will originate from non-PC devices.

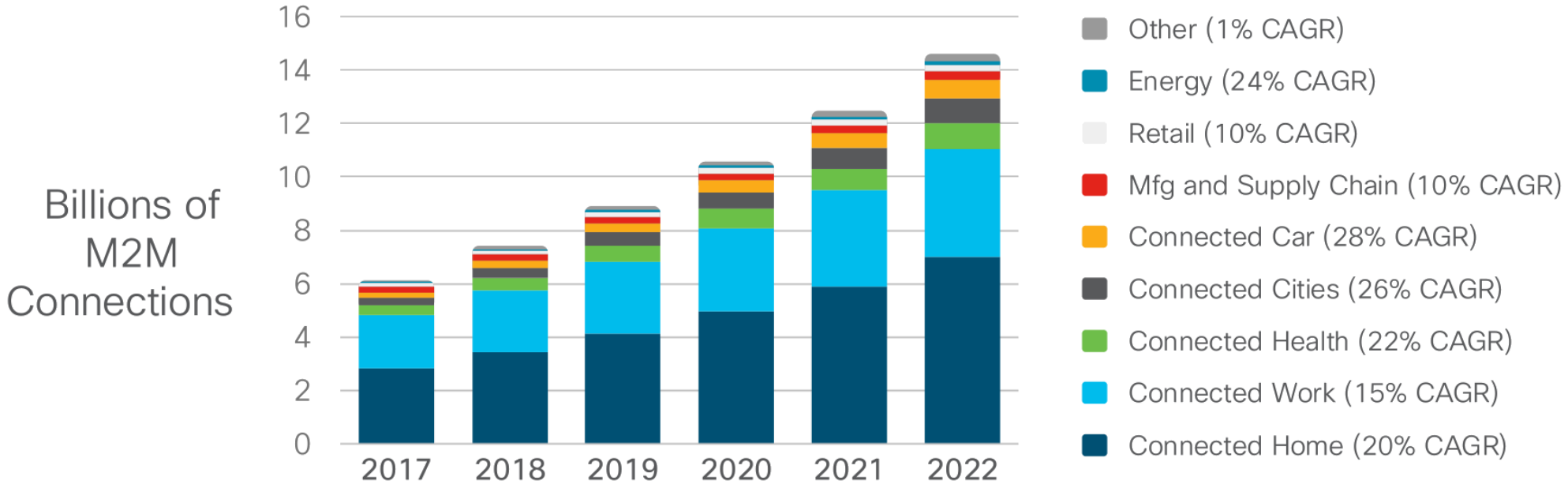
Internet of Things (IoT)

- Machine-to-Machine (M2M) is expected to show strong growth, driven by new use cases, e.g., in cars, machines and utility metering.
- The connected home is driving connectivity in consumer electronics
  - Mostly over Wi-Fi or Ethernet.



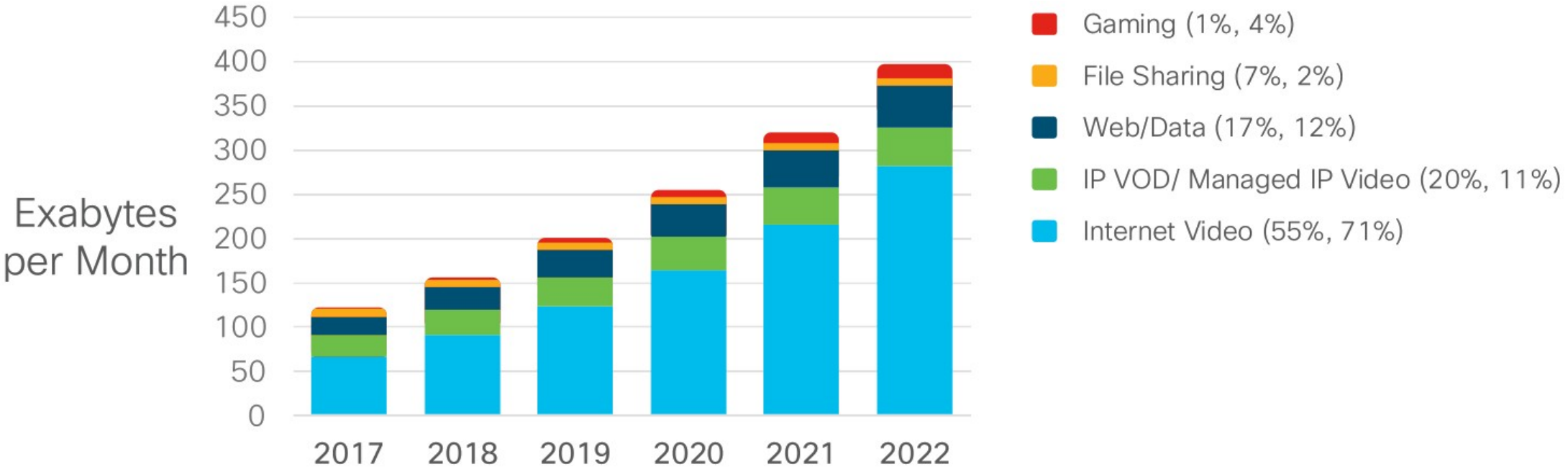
M2M Traffic





Source: Cisco VNI Global IP Traffic Forecast, 2017–2022

IP Traffic by Application

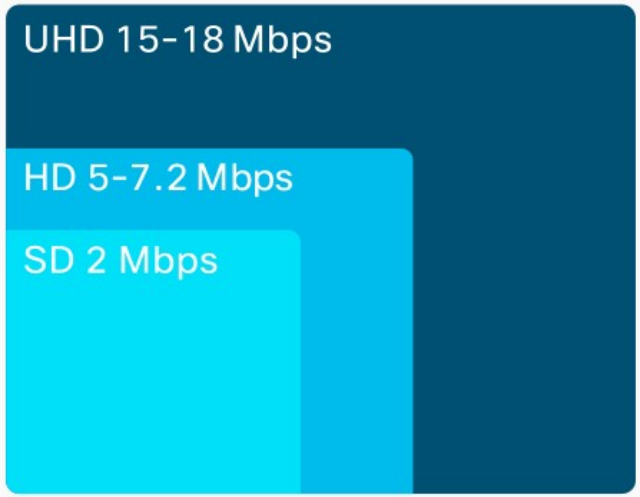


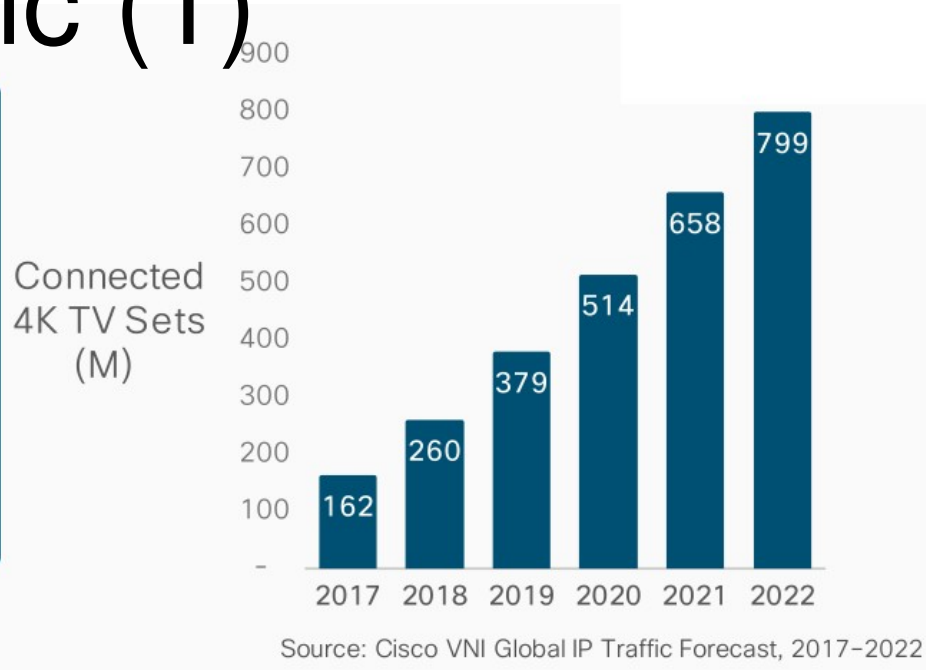
* Figures (n) refer to 2017, 2022 traffic share

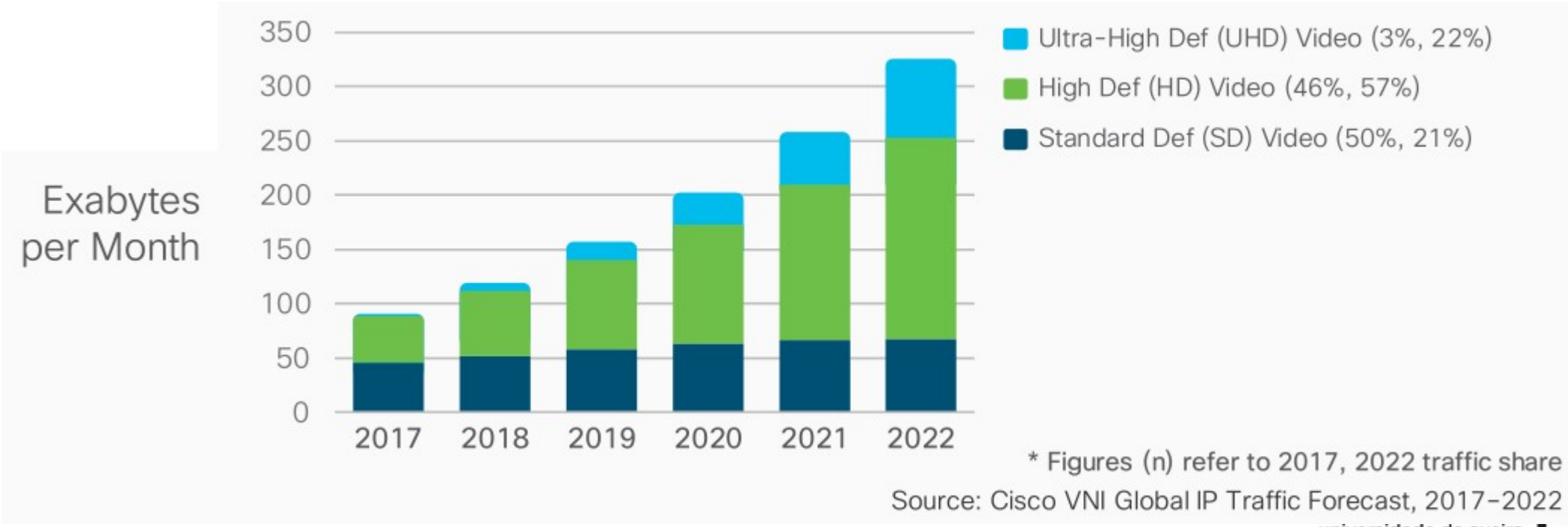
Source: Cisco VNI Global IP Traffic Forecast, 2017–2022

Video Traffic (1)

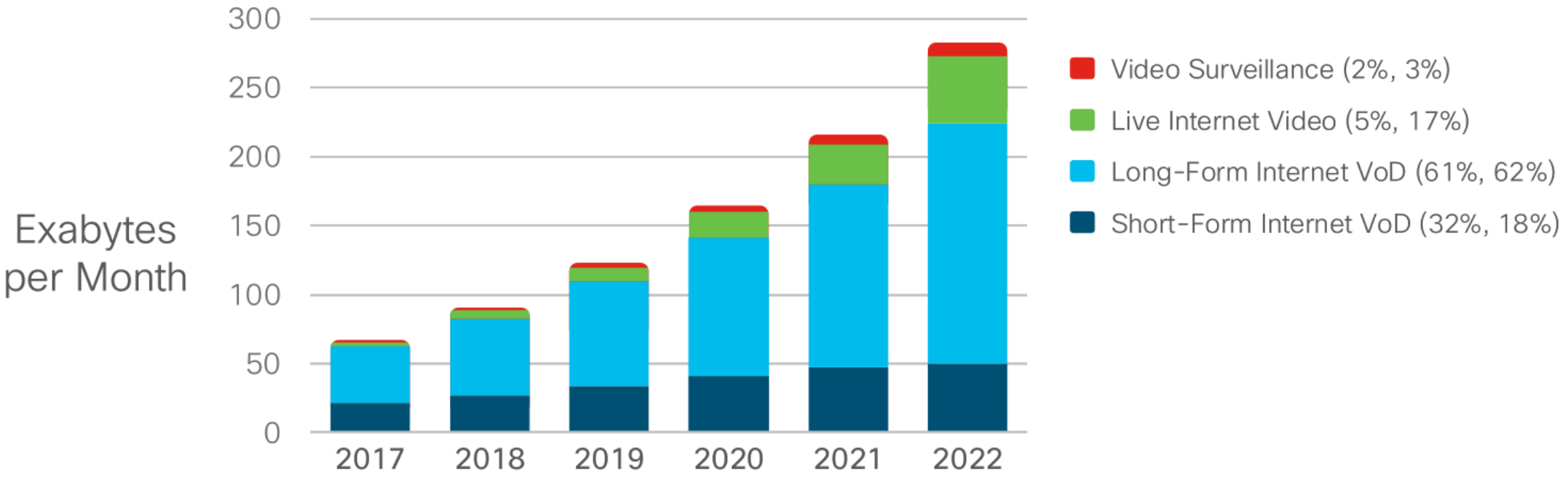
- The video impact of the devices on the traffic is more pronounced due to the introduction of ultra-high-definition (UHD), or 4K, video streaming.







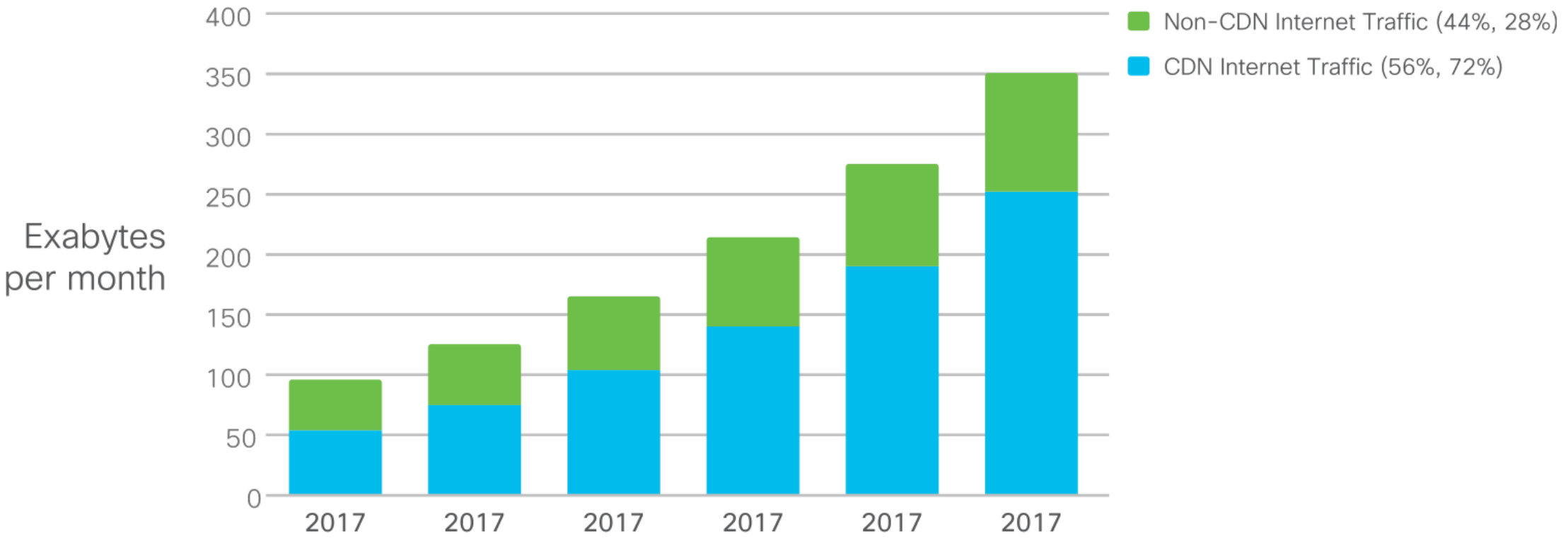
Video Traffic (2)



* Figures (n) refer to 2017, 2022 traffic share

Source: Cisco VNI Global IP Traffic Forecast, 2017–2022

Content Delivery Network (CDN) Traffic



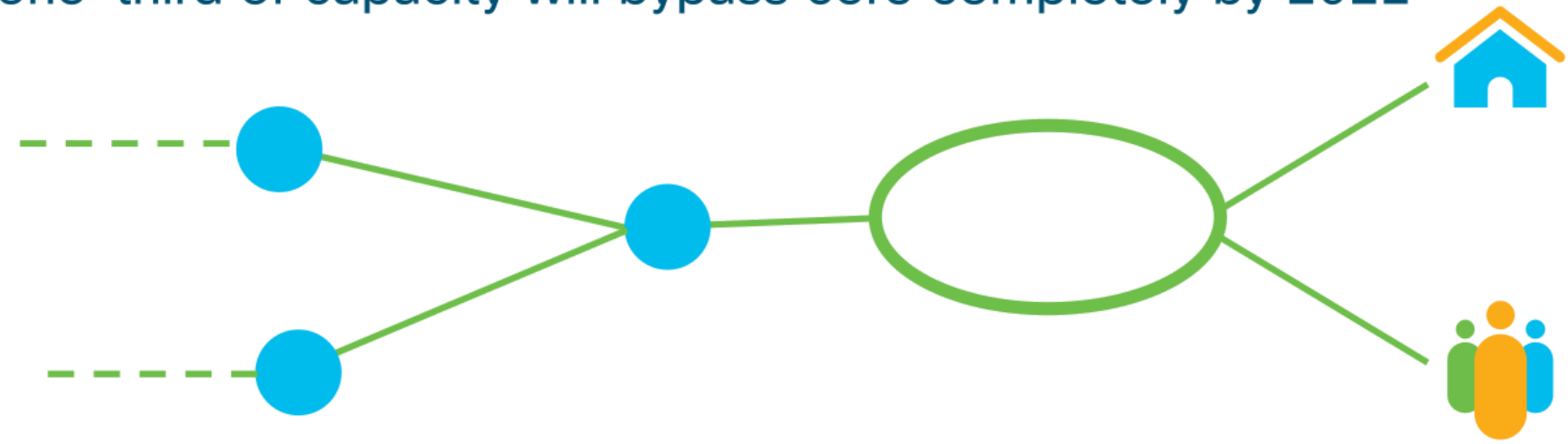
* Figures (n) refer to 2017, 2022 traffic share

Source: Cisco VNI Global IP Traffic Forecast, 2017-2022

- Changes in traffic topology are being brought about by the increasing role of Content Delivery Networks (CDNs) in data delivery.
- CDNs will carry 72 percent of total Internet traffic by 2022

CDN Traffic (Core to within Metro)

Over one-third of capacity will bypass core completely by 2022

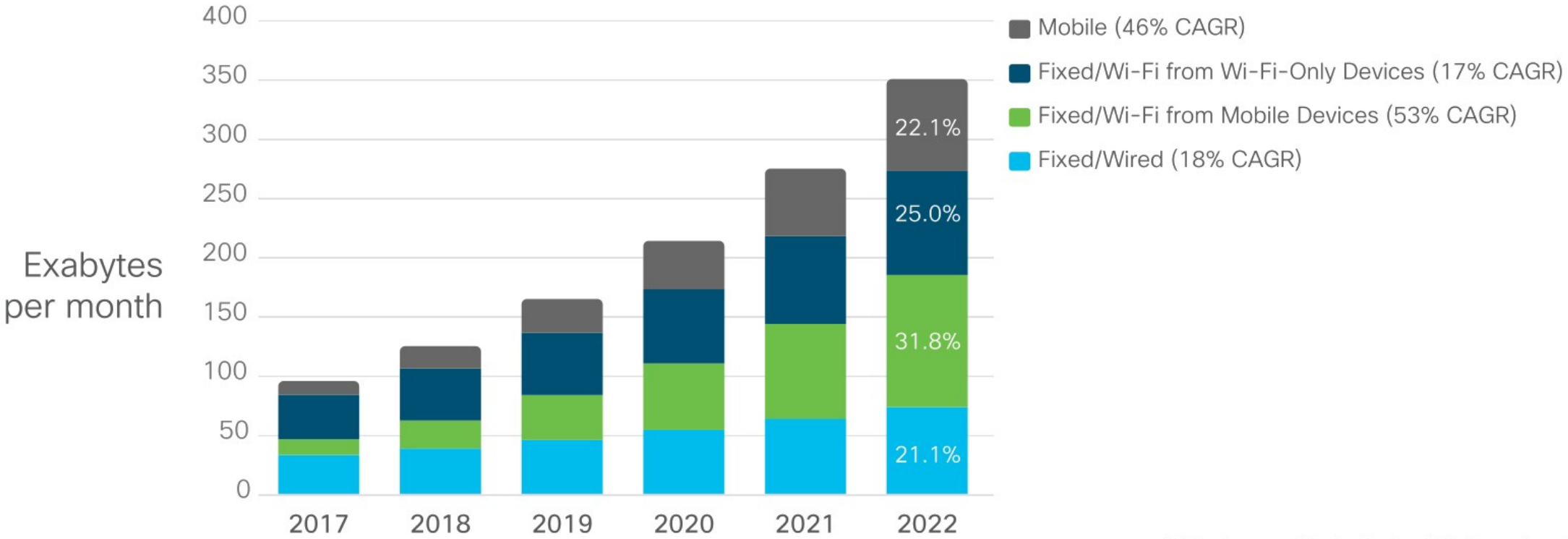


Core-Cross-Country	Core-Regional	within Metro
48% in 2017	25% in 2017	27% in 2017
43% in 2022	24% in 2022	33% in 2022

Source: Cisco VNI Global IP Traffic Forecast, 2017-2022

- CDNs will carry traffic closer to the end user, but presently much CDN traffic is deposited onto regional core networks.
- However, metro-capacity of the service provider networks is growing faster than core-capacity and will account for a third or 33 percent of total service provider network capacity by 2022, up from 27 percent in 2017.

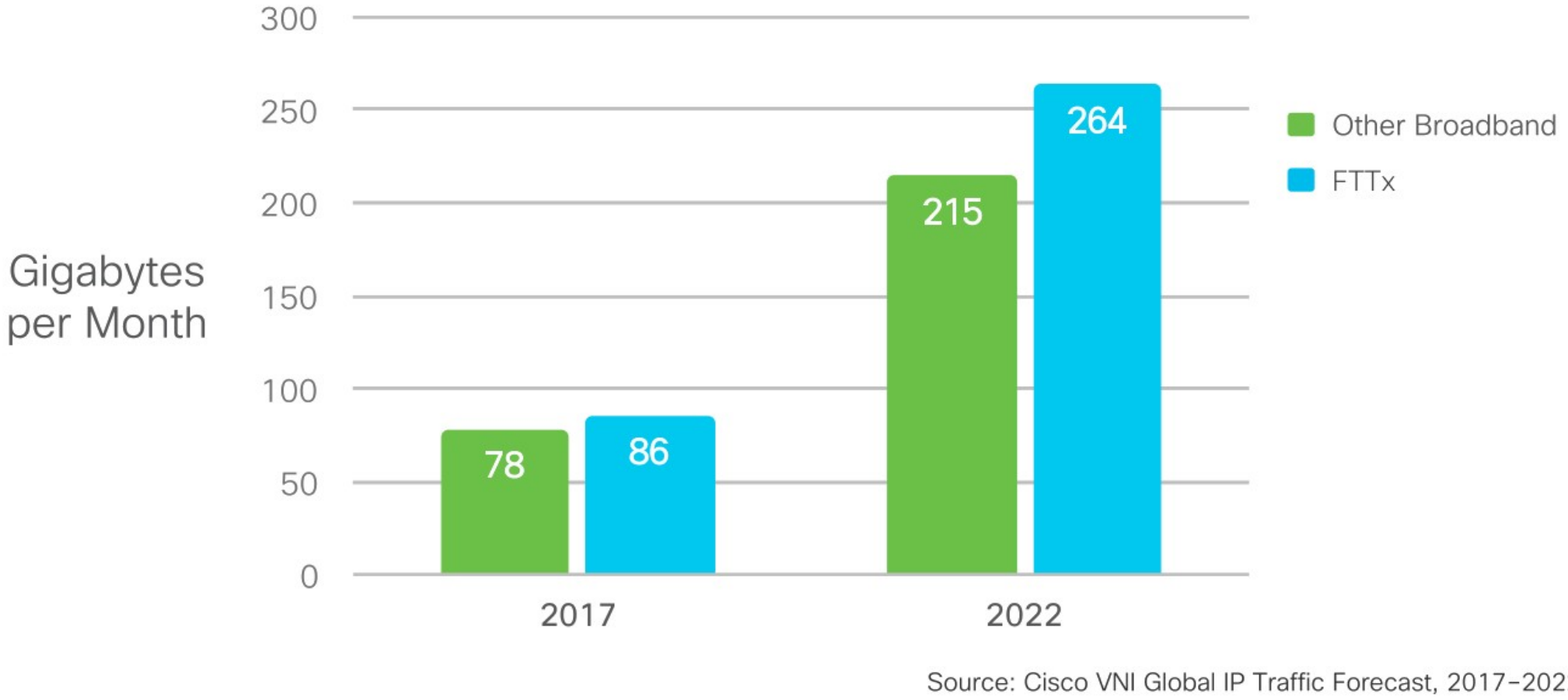
Wired vs. Wireless



*Wireless traffic includes Wi-Fi and mobile

Source: Cisco VNI Global IP Traffic Forecast, 2017-2022

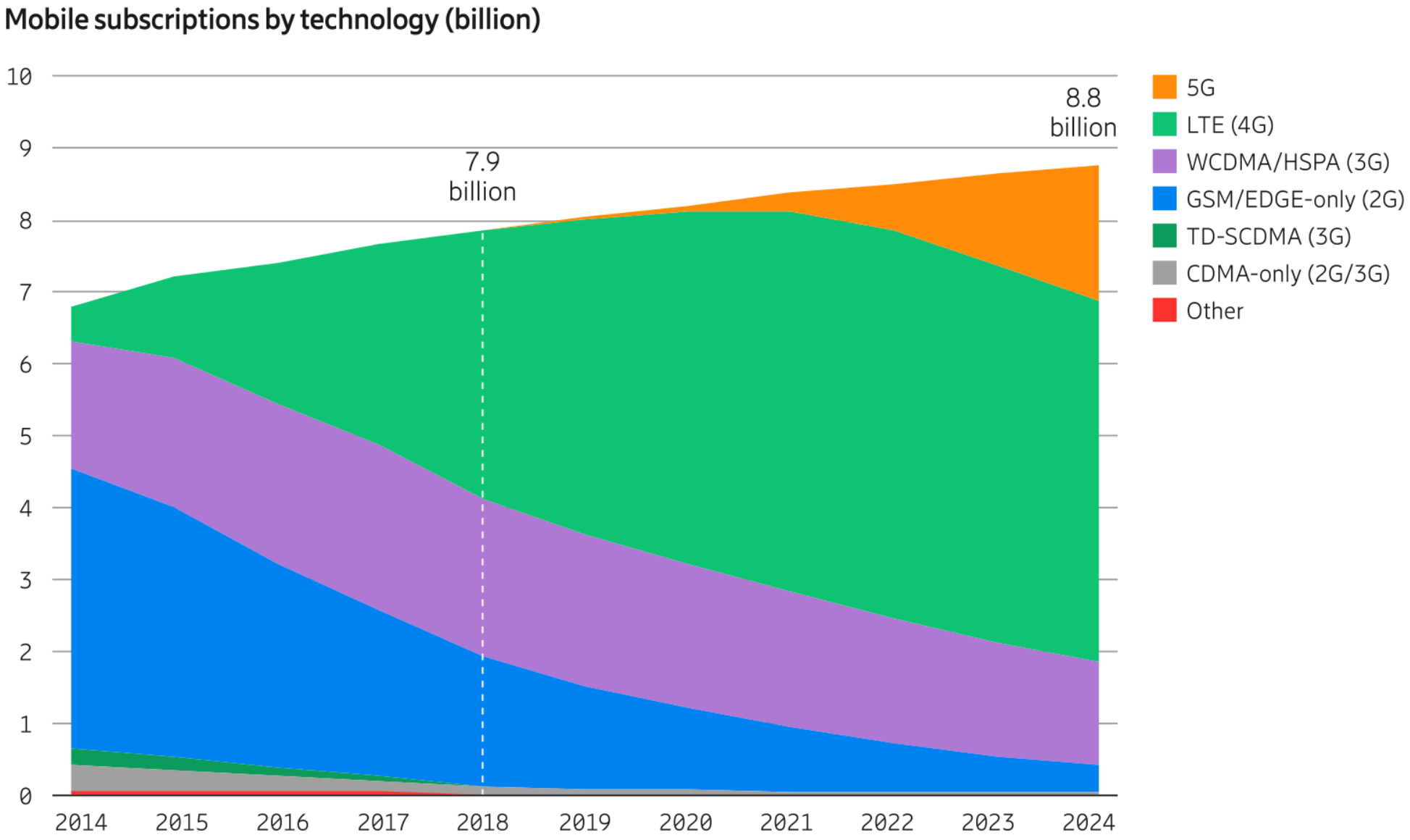
Fiber (FFTx) vs. other Broadband



Source: Cisco VNI Global IP Traffic Forecast, 2017–2022

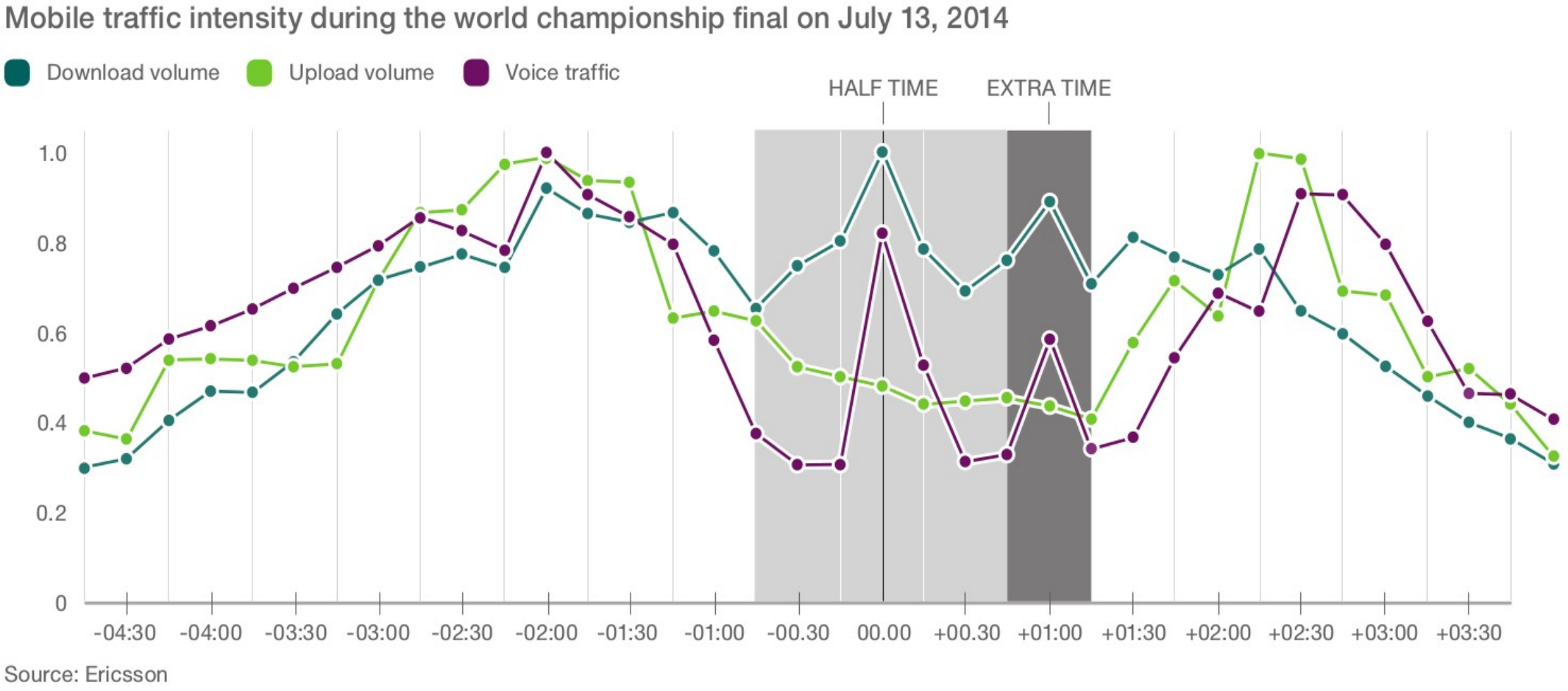
- 2017
  - FTTx/other=1.10
- 2022 prediction
  - FTTx/other=1.23

Mobile Technology



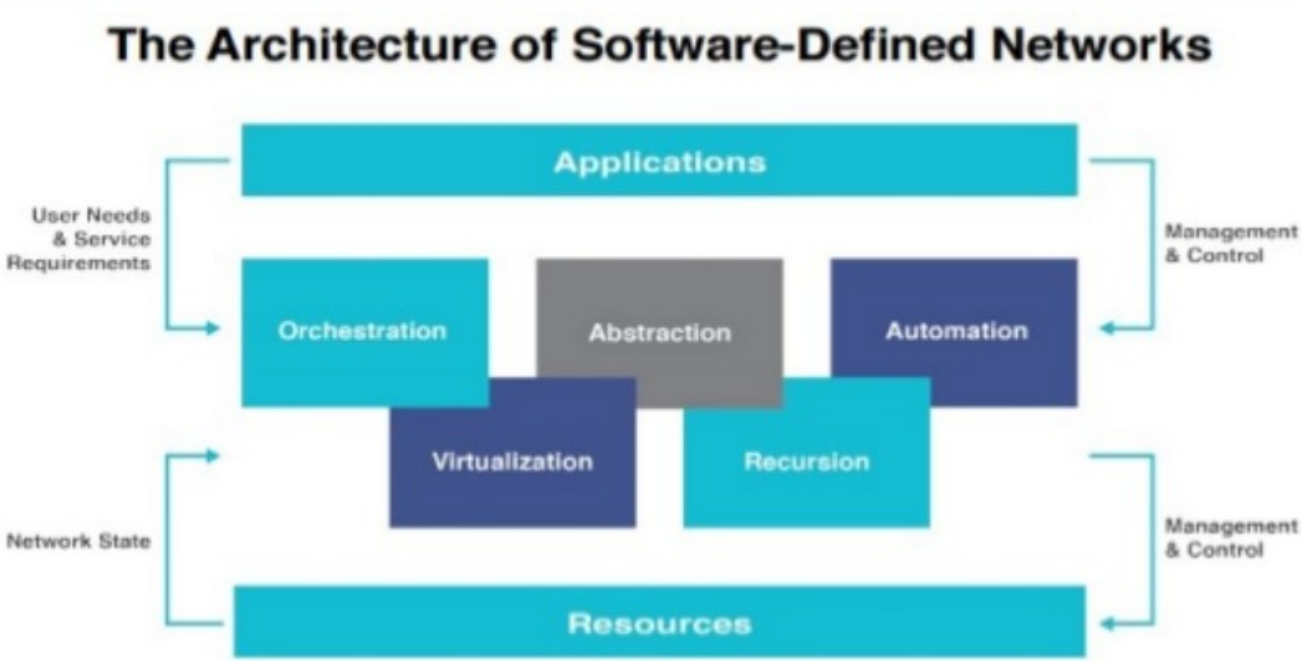
Source: Ericsson Mobilty Report 2019

Traffic Profiles Analysis and Prediction

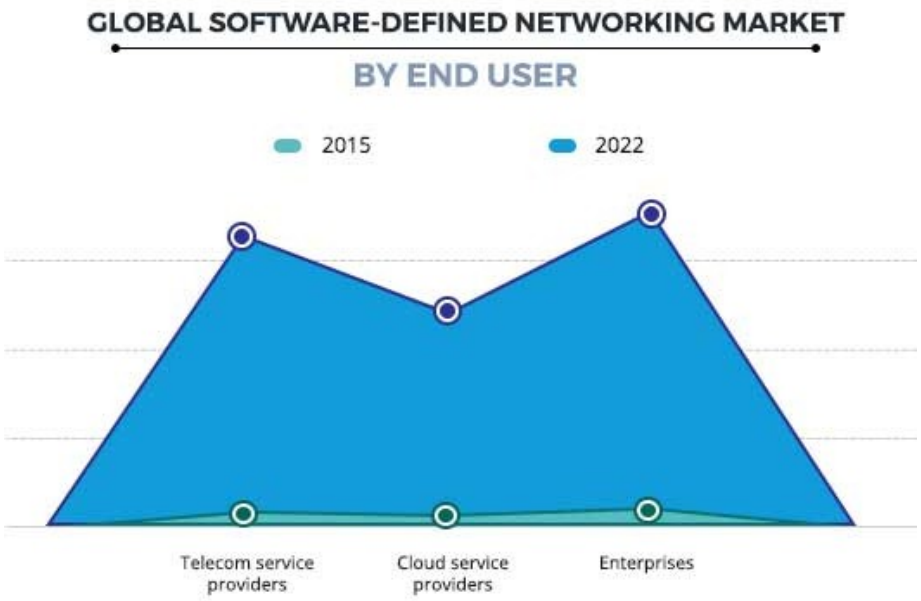


Need for Programmable Networks

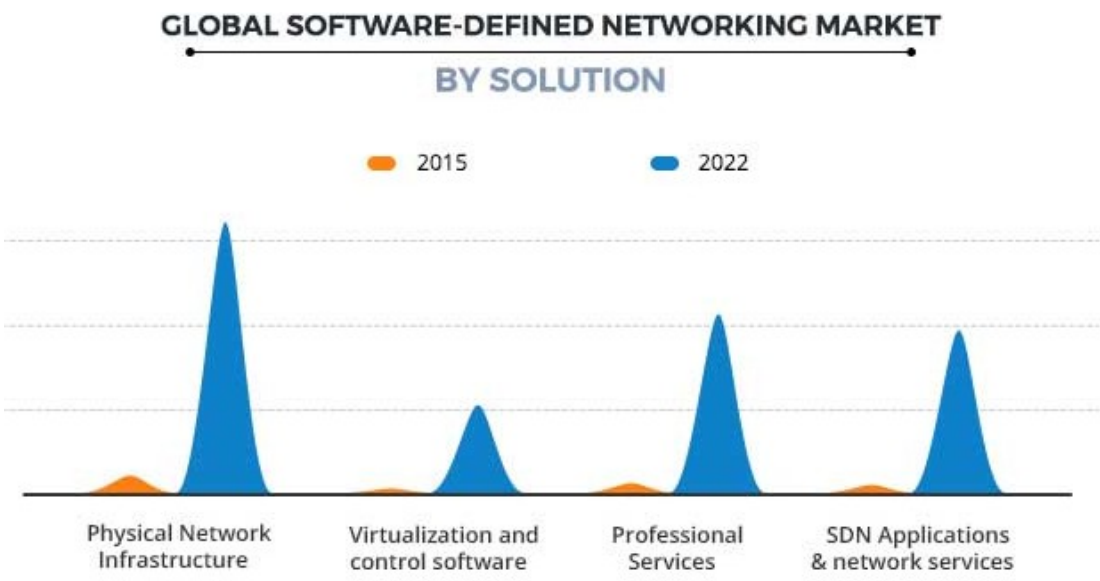
- Changing traffic patterns
- Rise of cloud services
- ‘Big data’ requires more bandwidth
- Inability to scale
- Need for open programmable networks
- Open standards-based and vendors-neutral



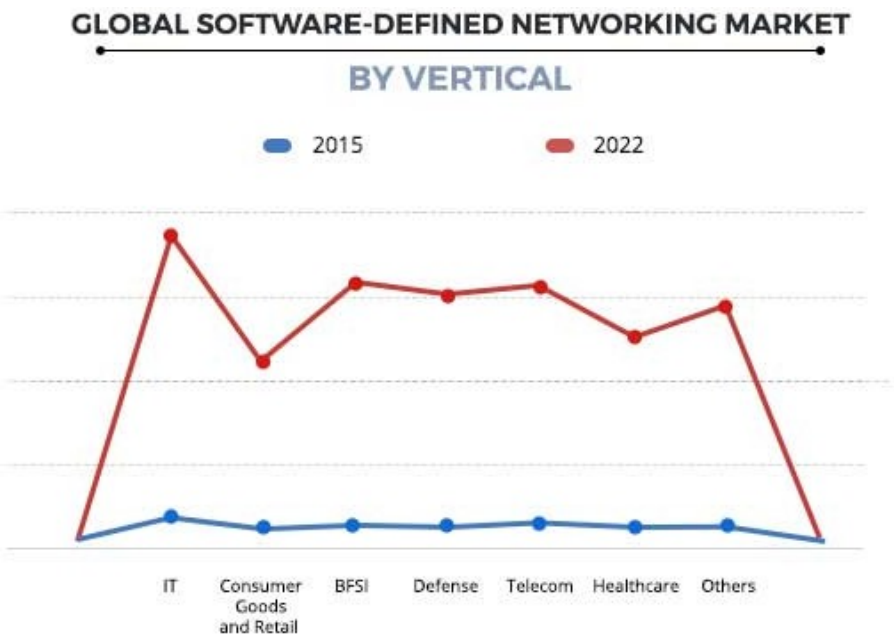
SDN Market Overview



Enterprises is projected as one of the most lucrative segments.



Physical Network infrastructure is projected as one of the most lucrative segments.



IT hold a dominant position in 2015.

Source: Allied Market Research - alliedmarketresearch.com

Sources

- Cisco, Cisco Visual Networking Index: Forecast and Trends, 2017–2022
  - https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-741490.html
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