The State of Connected Devices in North America 2020/21

May 2021

Our report provides a holistic analysis of the connected device market in North America, its recent trends, areas of growth and challenges, including the impact of the COVID-19 pandemic. Our data encompasses 1 billion connected devices in the span of 15 months between January 2020 and April 2021. This is the first real-life analysis of device usage in North America at this scale and precision. Our data shows what types of devices are online, their actual distribution, the overall market landscape as well as changes in popularity and how the pandemic impacted smart device usage on consumer home networks, which includes dozens of distinct IoT devices that make up the current smart home ecosystem.

Methodology

The information in this report was compiled using the following resources:

- **CUJO AI Labs Insights**

The CUJO AI Labs team provided in-depth analysis and historical data about the distribution, usage and identification of over 50,000 different device models and modifications on consumer networks. The scale and precision of our data comes from advancements of the CUJO AI Labs Device Intelligence team, which has developed robust artificial intelligence algorithms that can classify device types and models with extreme precision. Labs researchers provided insights into device intelligence and threat analysis as well as the Internet of Things (IoT).

- **CUJO AI Explorer Data**

CUJO AI Explorer is the cutting-edge device intelligence, identification and classification solution for large Network Service Providers (NSPs), deployed at unmatched scale–over 1 billion devices. AI algorithms in CUJO AI Explorer identify and classify connected devices down to the OS version. CUJO AI Explorer provides the highest quality data about the connected consumer device ecosystem while being fully compliant with the best privacy practices.

The data presented in this report is aggregated and fully anonymized before leaving any NSP's servers and does not use any privacy-invading technologies to identify and classify a device. Device identification algorithms used in Explorer are proprietary solutions patented by CUJO AI that can figure out:

The type of device that connects to a network: laptop, mobile, smart watch or any of the other 60+ categories of devices.

The brand or make of the model: Apple, Nintendo, etc.

The OS version or configuration of the device: iOS 11, Windows 8, etc.

Over 95% of all devices get identified down to the OS version in the first 24-48 hours with moderate Internet usage. CUJO AI Explorer can identify over 50,000 device models and configurations and is constantly updated with information about the newest devices and OS versions.

Device intelligence is an essential part of network security, which CUJO AI uses to determine whether there is anything suspicious about a given device. For example, an IP camera that starts sending data to an unusual location can be flagged and reported to the user or simply quarantined off direct access to the internet. In the past, when individual infected devices would threaten an NSP's infrastructure, there would be no other option than to cut off access to the Internet for the user. With device intelligence and CUJO AI multilayer security solutions, NSPs can isolate the affected device from the network without taking any other devices offline.

“**Precise device intelligence is an essential piece of the puzzle when it comes to preventative cybersecurity**: CUJO AI identifies a device and can wall it off from the rest of the network if it starts acting out of character, for example when a webcam starts connecting to servers in another country, as it is a sign that the device is compromised by malware or malicious actors.
Device intelligence also solves other challenges for network service providers, as they can create reliable device inventories and use this aggregated data for major decisions in network management or daily service provision, including dynamic bandwidth allocation.

Kimmo Kasslin
Head of CUJO AI Labs

Data

The data presented in this report is aggregated and fully anonymized before leaving any NSP's servers and does not use any privacy-invading technologies. As shown in the mobile device section, device intelligence is an extremely useful tool for evaluating cybersecurity risks.

A sample of the anonymized and pseudonymized data CUJO AI Labs use to improve device intelligence and other services:

Hostname: JohnDoe-iPhone —> {{NAME-[f-bead7ee21e099d7e7985e2f571f4c0d1b0665efdd13992c4f20234eeec8d595]}}-iPhone
MAC address: fa:60:db:a6:c7:12 —> fa:60:db:0610dcaca370-fa8350042e28ab9c0926d298bbd5b521a6cb218e691d04513d8b

Device distributions are presented as percentages of the overall device population, and changes in this percentage are treated as the indicator of the popularity of a category or device. Data points provided in the graph are quarter by quarter, signifying the end of the quarter. Some graphs will show device/category trends on a monthly basis for a more detailed view. All data points are gathered at the last day of the period and represent the whole period (i.e., Q1 2020 data will cover data from Jan. 1 to Mar. 31, 2020). More granular (monthly) data points are limited to July 2020-April 2021 and represent monthly data gathered on the last day of the month. Graphs that present "new connected devices" show only devices that went online on the network for the first time during the noted period.

CUJO AI categorizes devices into more than 60 distinct categories. Some niche categories (e. g., smart industrial fans) are not shown in the report for the sake of brevity. Find more information on the report and additional data at https://cujo.com/iot-device-usage-report/2020.

"Scale and data make artificial intelligence better–**the more devices we encounter, the better and more precise our results become**. At present, the scale CUJO AI operates at has allowed us to provide the most accurate device intelligence for network service providers without any noticeable service interference.
There is a lot of brain power and ingenuity that goes into making device intelligence algorithms at CUJO AI, and I am very proud of our team's results, which are bound to improve in the very near future.

Karolis Povilavičius
Device Intelligence Lab Manager CUJO AI

“ CUJO AI's **privacy compliance is a key value of our service**, as we ensure no personal data leaves the customers' premises without several steps that decouple the data from the user and the device.

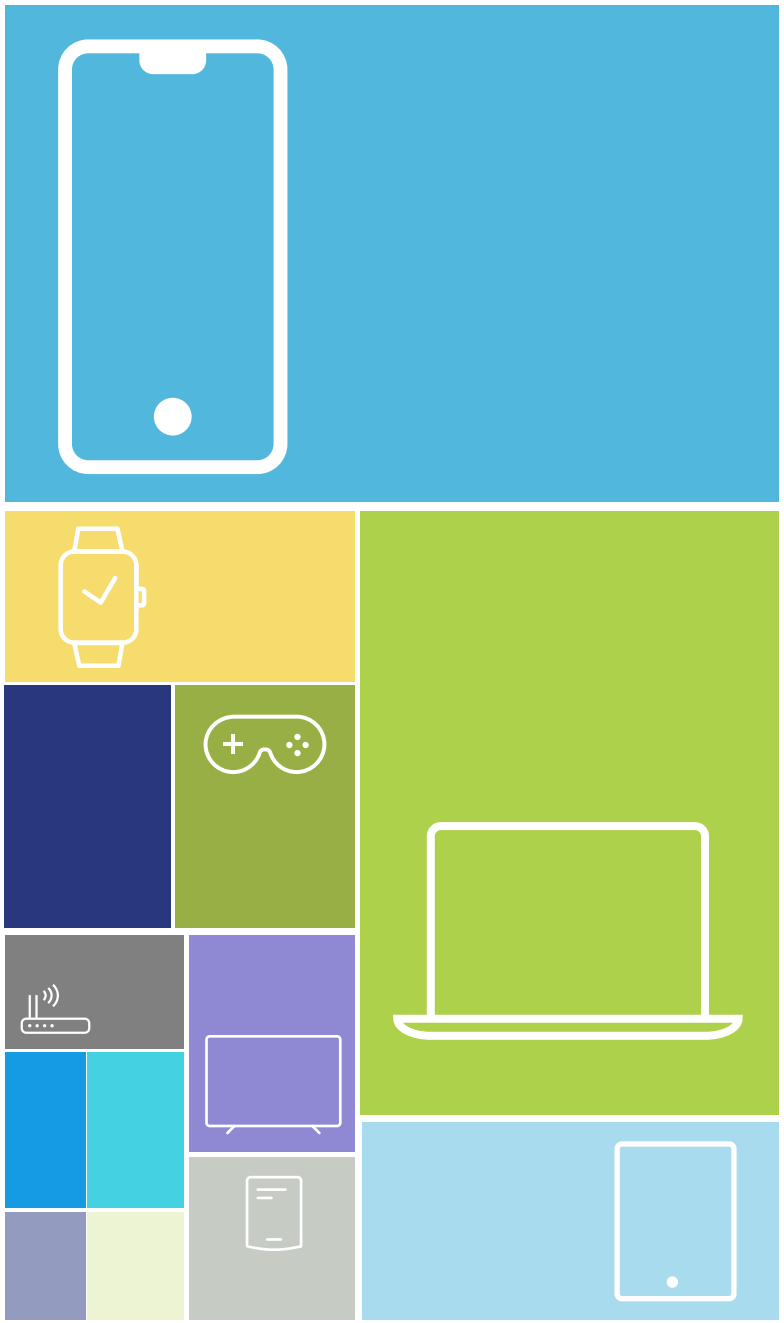
Our process uses several steps of anonymization and pseudonymization. Anonymization removes any identifying information, such as emails, names or passwords, and replaces it with placeholders. Some data such as MAC addresses are key for the operation of our services, but are personal and therefore pseudonymized and never stored in cleartext. We encrypt this data with state-of-the-art encryption, using unique cryptographic keys in each environment. All data is encrypted both in transit and at rest.

Matteo Cafasso
Lead Architect
CUJO AI

Table of Contents

Connected Devices: What Is Popular

Large Network Service Providers (NSPs) have tens of thousands of distinct device types, models and configurations (OS or firmware versions, etc.) online at any given moment. CUJO AI uses more than 60 distinct categories to simplify the inventory of millions of devices. While new categories are constantly added to the list, the top two connected device types (phones and computers) make up close to 60% of all connected devices.



NEW CONNECTED DEVICES IN NORTH AMERICA, APRIL 2021

- Phones
- Computers
- Tablets
- Watches
- Game Consoles
- Smart TVs
- Streaming Video Devices
- Routers
- Voice Control Devices
- Printers
- Set-top Boxes
- Cameras
- Other

The distribution of devices favorably falls into several tiers:

Most popular device categories make up over 3% of the overall device population

Widespread device categories that make up 0.5%-3% of all devices

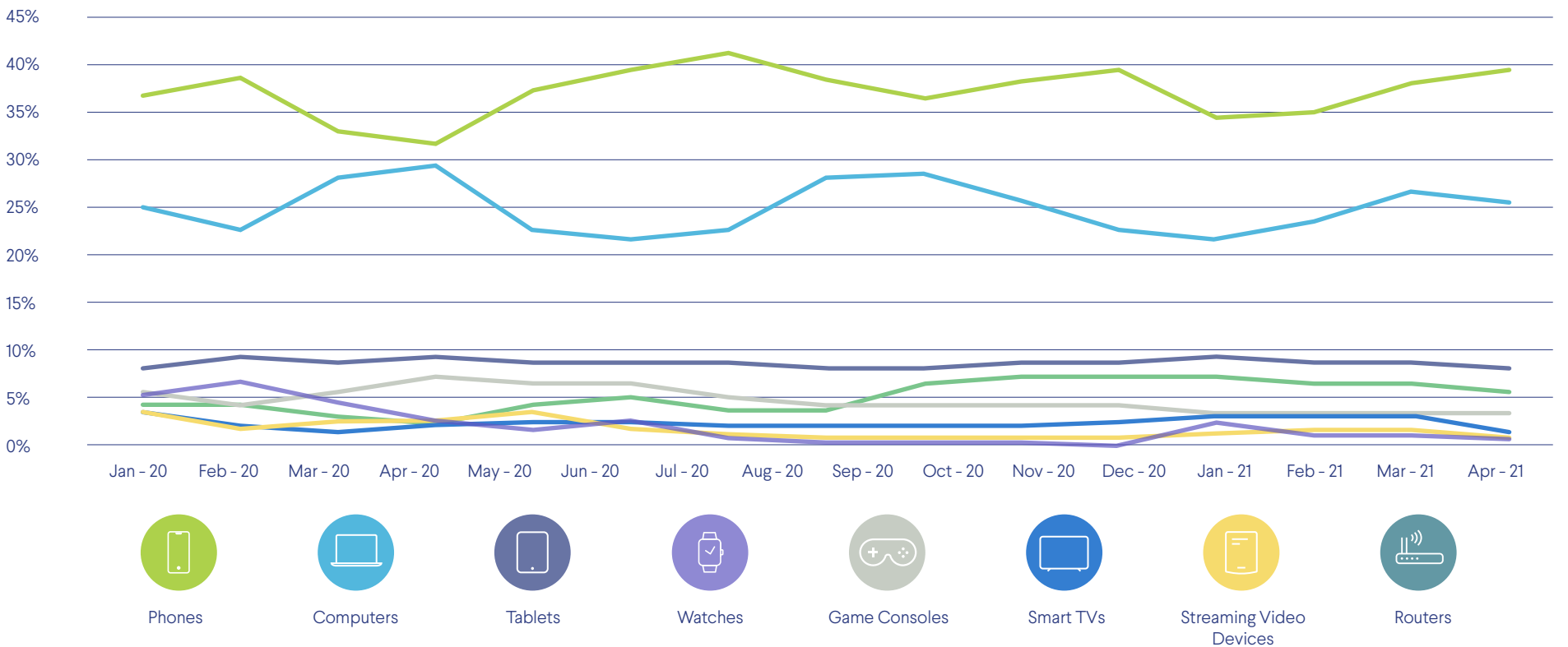
Niche categories that comprise 0.05%-0.5% of the device pool

Smartphones are the most common connected devices with a little over 38% of all connected devices.

In general, device categories below 0.5% distribution will not be reviewed in this report, with a few notable exceptions relating to the themes of the other sections of the report. Note that 1% distribution represents approximately 10,000,000 devices going online, which makes even the smallest fluctuations in these graphs quite substantial.

Smartphones are the most used connected devices, rivaled only by computers (desktops and laptops combined), with a little over 38% of all connected devices in March 2021, a nominal increase of nearly 3% since January last year, while it had experienced a significant decrease in relative new connections during the initial quarantine.

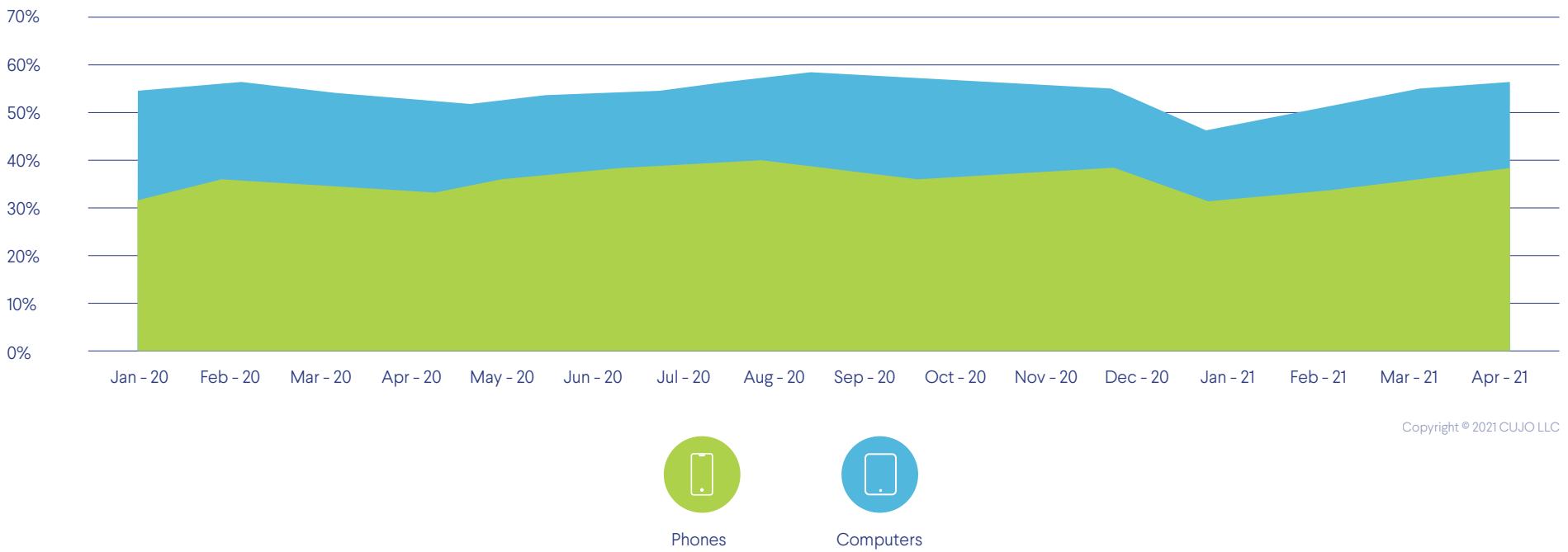
CONNECTED DEVICE CATEGORIES THAT MAKE UP OVER 3% OF THE TOTAL CONSUMER DEVICE POOL IN NORTH AMERICA



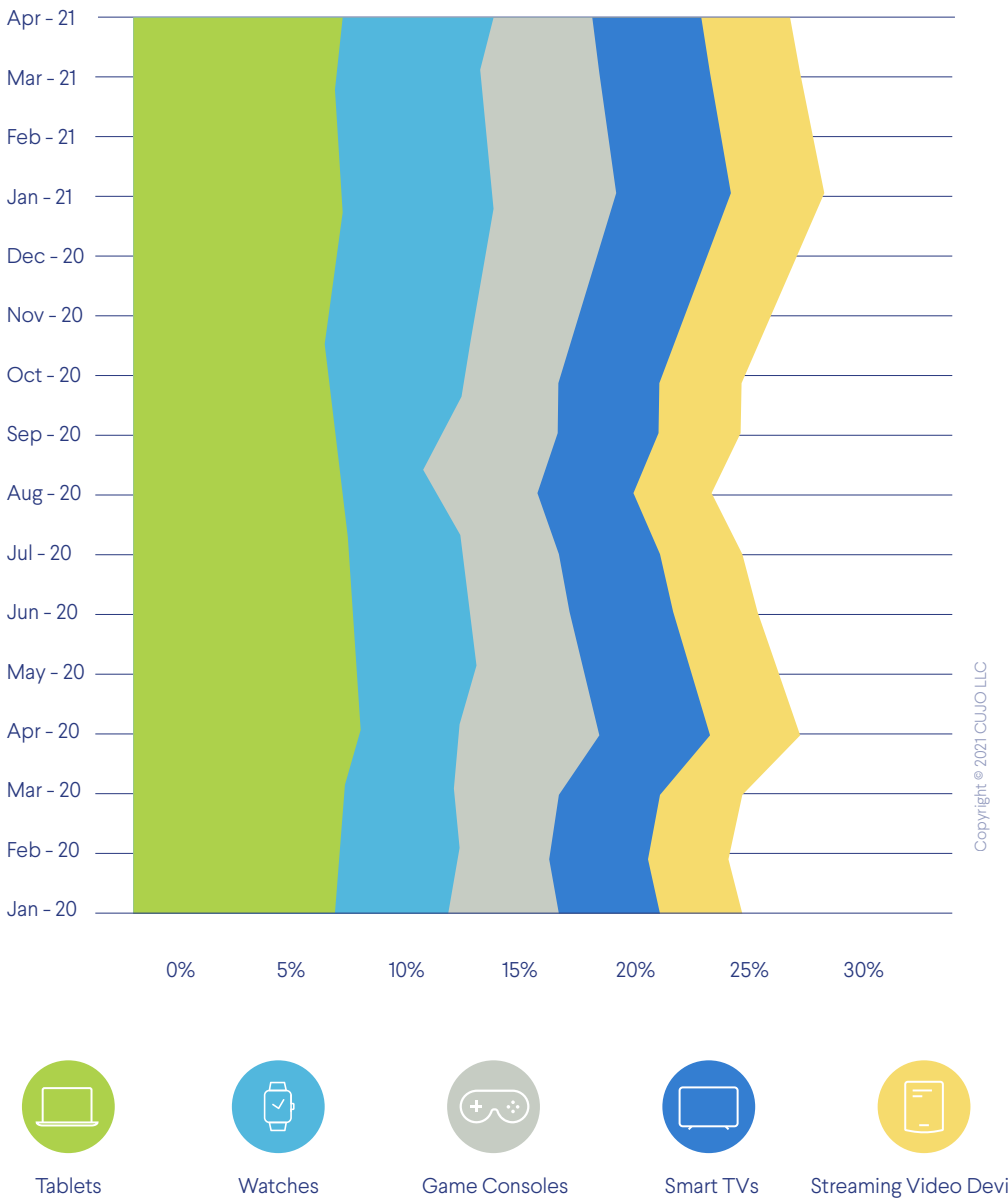
The 2020 lockdown resulted in more computers going online on consumer networks.

We can see that the 2020 lockdown resulted in more computers going online on consumer networks, which we associate with remote work as well as remote schooling and the need for pupils to have their separate computers at home. We have previously released data on the rise in malicious activity patterns related to remote work, which can be accessed here.

MOST POPULAR DEVICES: COMPUTERS AND PHONES, PERCENTAGE OF ALL NEW DEVICES CONNECTED, JANUARY 2020 - APRIL 2021



POPULAR DEVICES, PERCENTAGE OF ALL NEW CONNECTED DEVICES, JANUARY 2020 - APRIL 2021

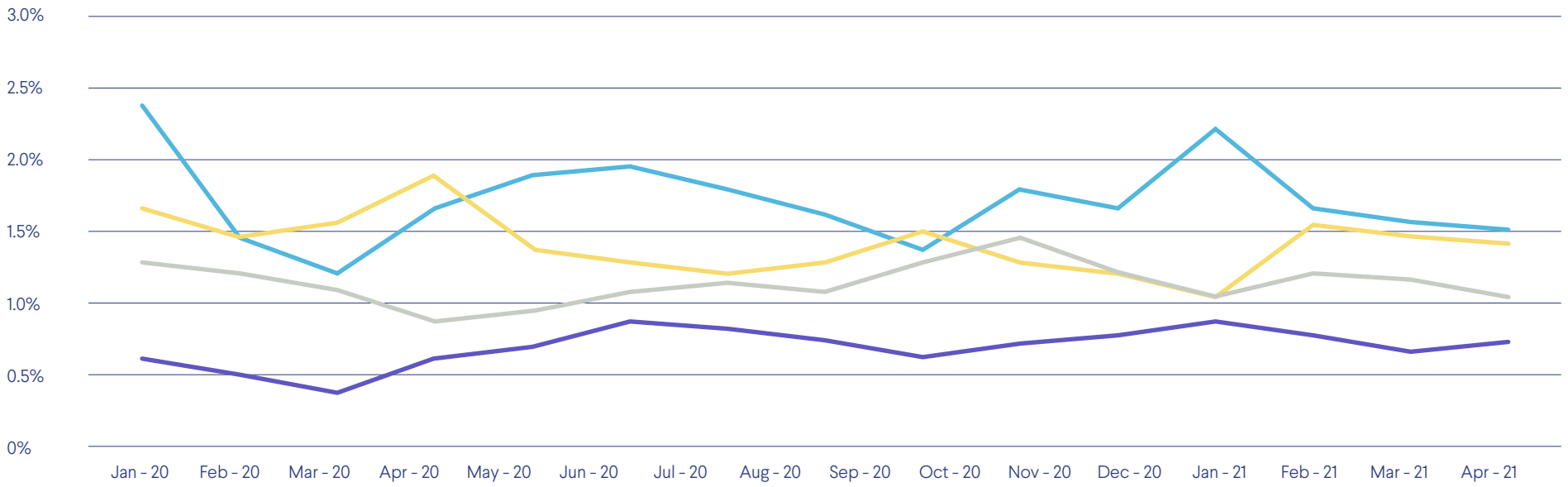


Tablets and smart TVs do not show growth trends in their respective markets.

As for other device categories that make up over 3% of new devices in consumer networks every month, we see five notable device types: tablets, smart watches, gaming consoles and smart TVs. Of the four, only smart watches and gaming consoles had significant fluctuations, which will be reviewed in subsequent sections of the report. The tablet and smart TV categories seem to have reached points of saturation in their respective markets.

Connected device categories that make up 0.5%-3% of new connected devices in North America every month

POPULAR WIDESPREAD DEVICES, PERCENTAGE OF ALL NEW CONNECTED DEVICES, JANUARY 2020 - APRIL 2021



Voice Control Devices

Printers

Set-top Boxes

Cameras

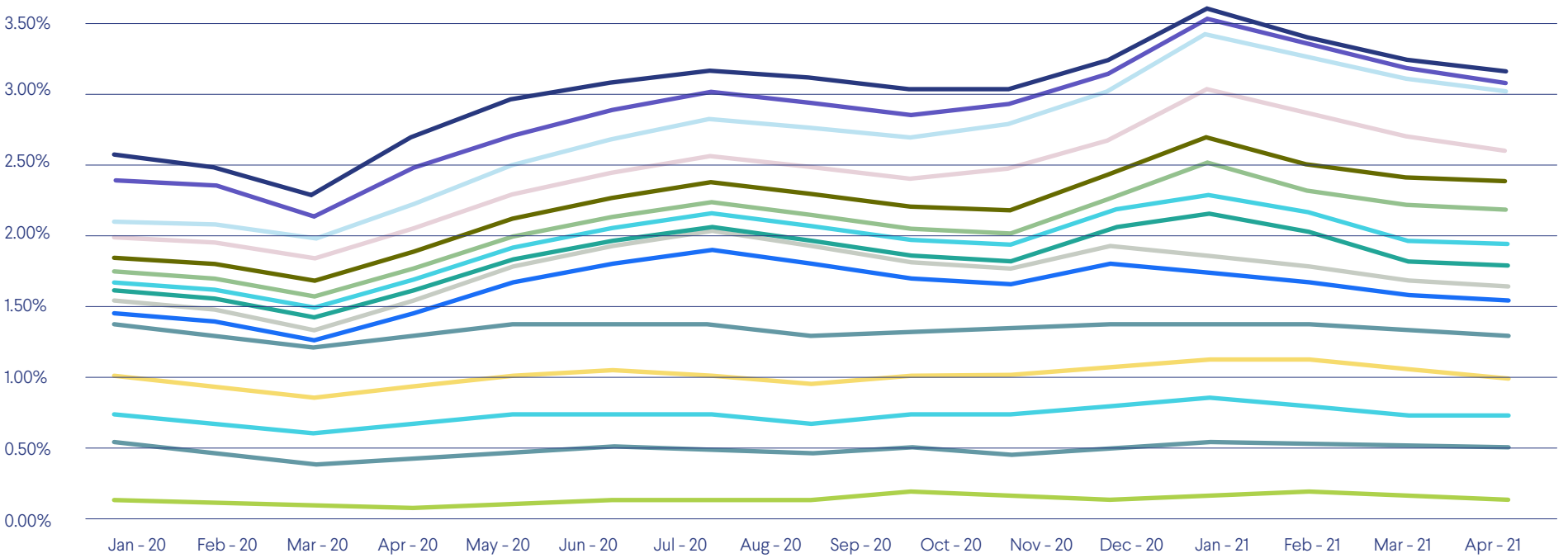
Streaming video devices and set-top boxes did not gain a lot of popularity during the pandemic.

Several notable device categories are in the range of 0.5%-3%: a mix of smart home (IoT) appliances, traditional gadgets (cameras, printers) and connected multimedia devices. Set-top boxes, much like streaming video devices, are not gaining a lot of popularity, even though the latter had a significant boost at the start of the pandemic.

Printers, cameras, voice controllers and IoT-connected devices experienced somewhat steady popularity from January 2020 to April 2021. Voice control devices showed a significantly increased popularity after the holidays. See the smart home IoT section for more details on voice control devices and IoT appliances.

Connected device categories that make up 0.05%-0.5% of the total consumer device pool in North America every month

NICHE DEVICES, PERCENTAGE OF ALL NEW CONNECTED DEVICES, JANUARY 2020 - APRIL 2021



- IP Cameras
- Wireless Audio Devices
- Lighting Appliances
- Thermostats
- Portable Music Players
- E-readers
- Doorbells
- Outlets
- Alarm Systems
- Other Devices
- Sports & Fitness Devices
- Audio-video Devices
- Home Robots
- Smart Home Automation Devices
- DVR Devices
- Garage Openers

Dozens of device categories are below the 0.5% threshold. While these devices can be considered niche, it is important to remember that every 0.1% in this chart represents approximately 1 million devices across North America.

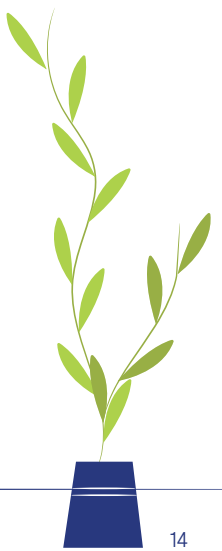
While not found in most consumers' homes, these devices have strong niche usage patterns with several device types showing promise for wider adoption in the future. We will take a closer look at some of these categories in the IoT smart home section.

The General Device Population: Key Takeaways

The data in this report reflects how people in North America dealt with the Covid-19 pandemic, quarantine and self-isolation. As the quarantine began, some interesting trends emerged in IoT devices as well as more common niches (gaming, wearables).

Device connectivity after the holiday season is an important metric for new device adoption: After all, it's not the sales but the usage of the device that signals its usefulness and desirability. Since some of our later graphs will represent device popularity in quarter-over-quarter graphs, the Q4 2020 will combine Black Friday and the holiday season into a single data point for device desirability.

It is also plain to see that popular devices have a stable demand. For instance, GSMA predicted that adoption of smartphone devices could reach 75% by 2020, so it's perfectly normal to see only a 3% variation in new smartphone popularity during the given period because of a saturated market.



Mobile Devices Still Dominate

This section combines smartphone and tablet data to give you an overview of the largest segment of the connected device ecosystem: mobile devices. Research shows that there will be 328 million smartphone users across the region by 2025, making up nearly nearly 86% of the local population. And many of them will own more than one connected mobile device, bringing the number to 420 million subscribers by 2025. These predictions suggest a 109% market penetration.

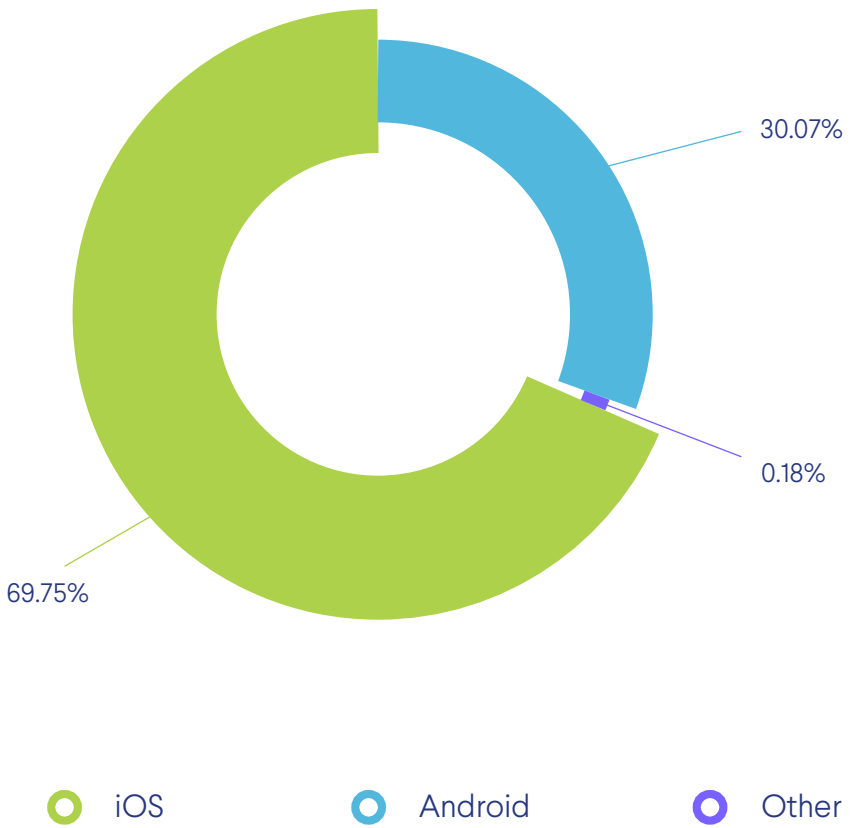
While these numbers are impressive, it is also essential to consider the massive security challenges stemming from abandoned devices that are no longer updated.

"We see many new brands and devices coming into use over time, but if there's one key takeaway I have from working with the data for this report, it is the dominant position a single brand has in North America: close to **40% of all connected devices are made by Apple.**

Paulius Janonis
Device Intelligence Lab analyst

SMART PHONE OS DISTRIBUTION IN NORTH AMERICA, APRIL 2021

The mobile device ecosystem in North America is clearly dominated by iOS devices, making up over two-thirds of the mobile device population. Android has close to one-third penetration, with legacy systems no longer represented in any significant numbers.



iOS devices make up over two-thirds of the new mobile device population in North America.

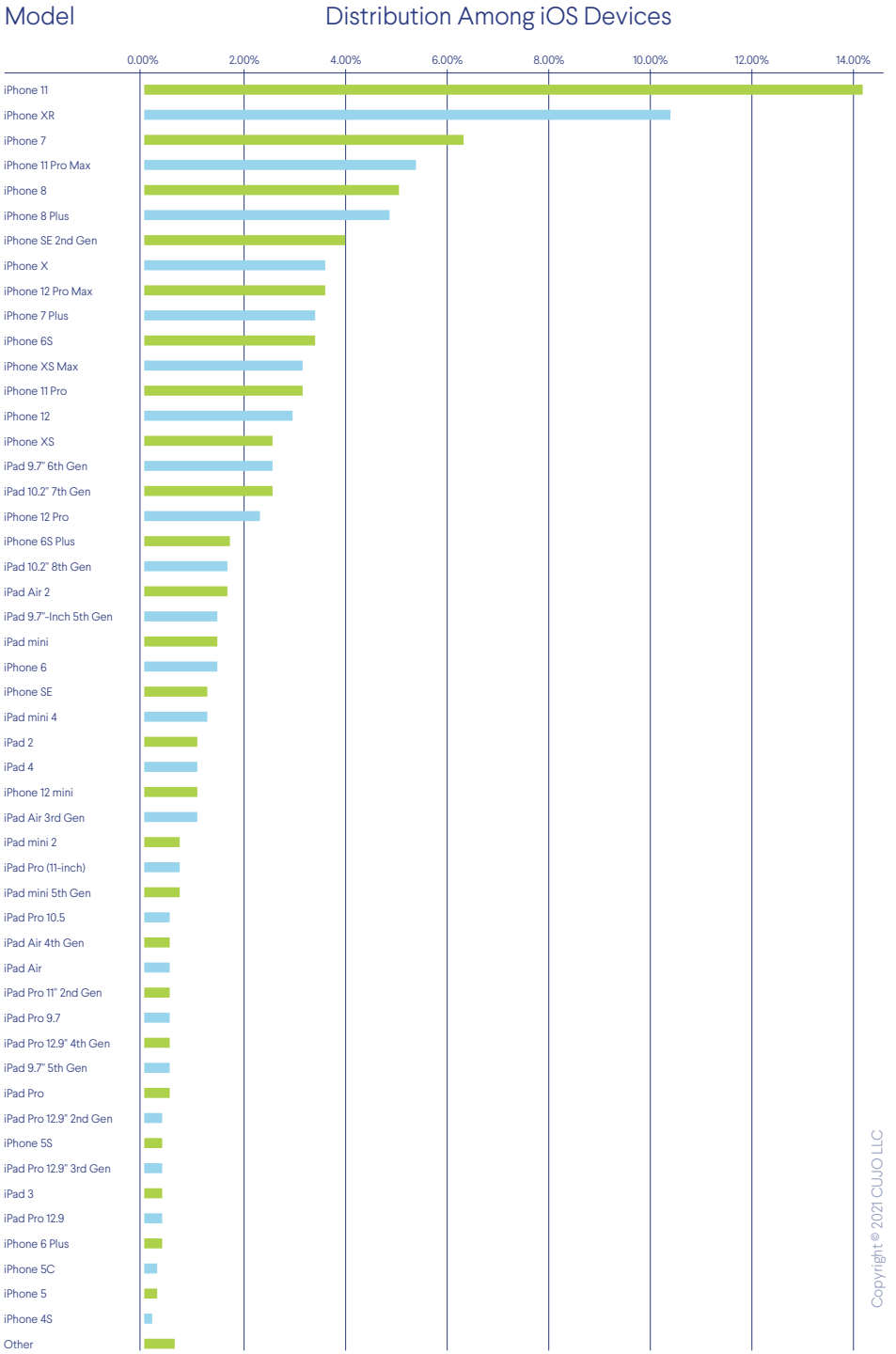
iOS Device Breakdown by Model

Close to six months after the release of the series 12 iPhones, we can see how the adoption of the newest models and the lifetime of older devices looks in North America. The most popular iOS devices are the iPhone 11 (14%), iPhone XR (10.4%) and iPhone 7 (6.3%). In terms of iOS tablets, only a few iPad models have significant numbers. The highest share for an iPad amongst all iOS devices is for the iPad 6th generation (released three years ago) at 2.35%.

> ***iPhone 11 is the most popular iOS device, making up 14% of all iOS devices online.***

In May, new iOS devices made up 72% of new mobile devices. This short-term fluctuation was likely due to the release of the new iPhone SE 2 model. The budget iPhone may have seduced a significant number of Android users to switch over.

Overall, the iPhone SE (2nd generation) is the fourth most popular iOS model as of April 2021, used by 3.7% of iOS users, closely followed by the newest flagship device iPhone 12 Pro Max.



SMART PHONE OS DISTRIBUTION IN NORTH AMERICA, APRIL 2021

Android Device Breakdown

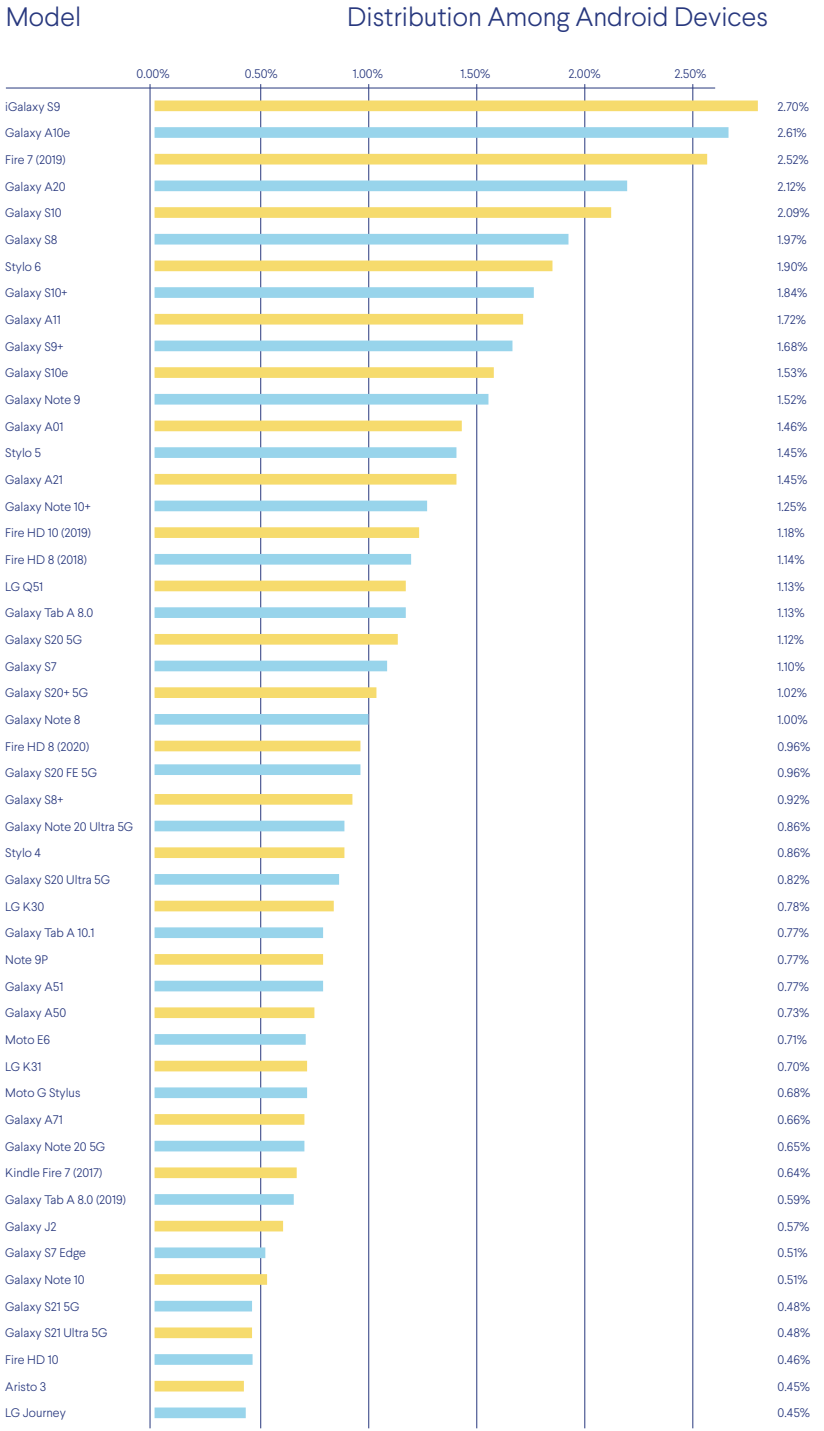
The Android device ecosystem is a lot more differentiated. There are thousands of Android devices online, which is why providing a full in-depth overview in this report is not feasible. Even the most popular Android models have a significantly smaller distribution when compared to iOS devices.

Among thousands of models, no Android device has more than 3% of the Android market.

Samsung Galaxy S9 was the most used Android phone for 2.7% of the market, while Samsung Galaxy A10 came in a close second with 2.61% of Android users. The latest flagship Android devices from Samsung, the Galaxy S21, currently make up close to 1% of the mobile Android device ecosystem. Amazon's Fire 7 tablet is one of the most popular Android devices with over 2.5% adoption.

It is important to note that many people still use mobile Android devices that are quite old. This can pose **a serious security threat** to their personal data since these devices no longer get security updates from manufacturers. We asked our researchers from CUJO AI Labs to briefly overview this information and provide some security insights about the mobile device ecosystem.

MOST POPULAR ANDROID MOBILE DEVICES (56% OF ALL ANDROID DEVICES)



Smartphone Population Signals Security Issues

Written by Zoltán Balázs,
Head of Vulnerability Research Lab
CUJO AI

There are currently more than 7,000 Android devices online with no easy way to determine which ones are no longer supported by vendors.

CUJO AI Labs investigated the distribution of the top 50 iOS and top 50 Android phone and tablet models to see how many of these devices are already end-of-life (EoL), meaning they no longer had a vendor-supported way to install security patches.

By looking at the top 50 devices only, we can see that the situation is good for both the iOS and Android ecosystems. In terms of device models, only 2.7% of devices from the top 50 Android models are EoL, and only 5.2% of the top 50 iOS devices. But this does not tell the whole story.

Close to half (43.6%) of all Android devices are not represented among the top 50 devices, while this number is only 0.8% for iOS devices. What does it mean? Android phones and tablets are highly fragmented, as there are in total **7,027(!) different Android device models** in active use in our userbase. As for iOS, this number is 56.

When we talk about Android security, it is important to note that some vendors are better than others at providing information about their security practices. For example, Samsung makes it is easy to identify whether a device is still supported. It is also clearly communicated how long a new Samsung Android device will be supported. Unfortunately, this is not the case with many other vendors manufacturing Android phones and tablets.

On the other hand, the fragmentation of the Android device ecosystem can also be seen as a small positive on the security side. Many attacks are tailor-made for specific device models and do not work on others. This means that it might be less beneficial for malicious actors to create attacks against Android devices than iOS–as these attacks will work against fewer devices. One thing is for sure: Even with advanced device intelligence, network service providers might struggle to investigate the security risks in their mobile device population, as things are quite complicated when it comes to patching Android devices and determining the EoL of 7,000+ device models.

Computers Still Going Strong

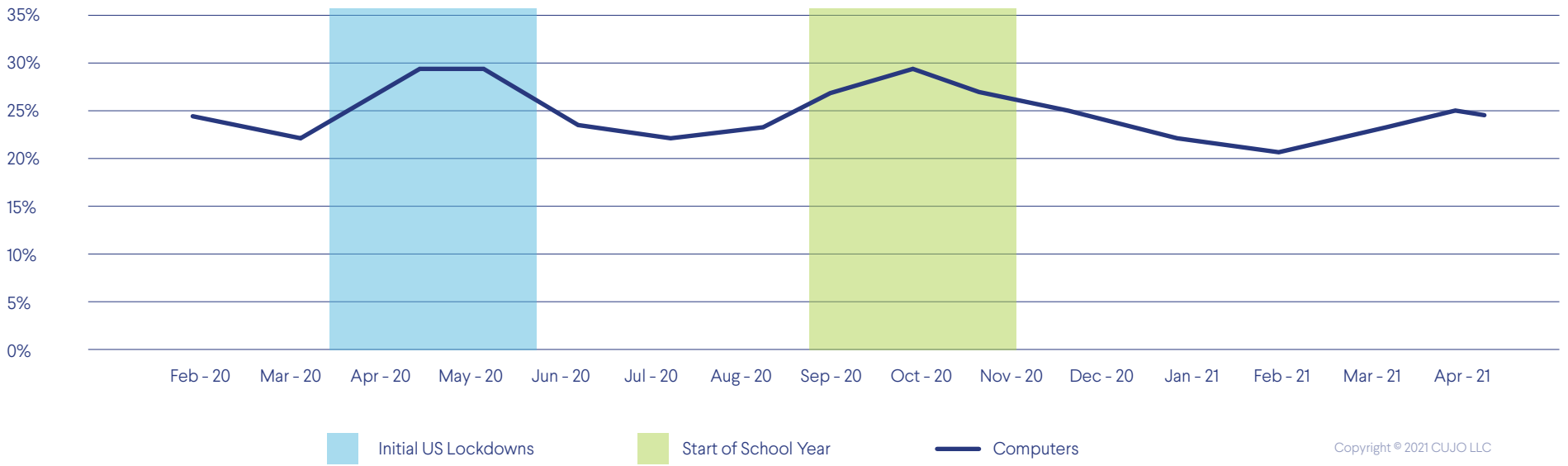
Personal computers no longer make up the majority of consumer devices on the Internet, yet they remain one of the largest segments of connected devices. As smartphones, wearables and IoT devices continue grow and evolve, it is likely that computers will continue to decline in relative popularity and will make up a smaller percentage of all connected devices.

> ***Personal computers no longer make up the majority of consumer devices on the Internet.***

The pandemic significantly increased the usage of computers on consumer networks for short periods of time.

As for the year 2020, our data shows that the pandemic significantly increased the population of new computers on consumer networks for short periods of time, which we attribute to remote work (i.e. more work computers) and remote schooling (i.e. more school computers at home) during stricter quarantine lockdowns, as the distribution of computers among new devices went back to around 25% by April 2021.

COMPUTER PERCENTAGE OF ALL NEW CONNECTED DEVICES, FEBRUARY 2020 - APRIL 2021



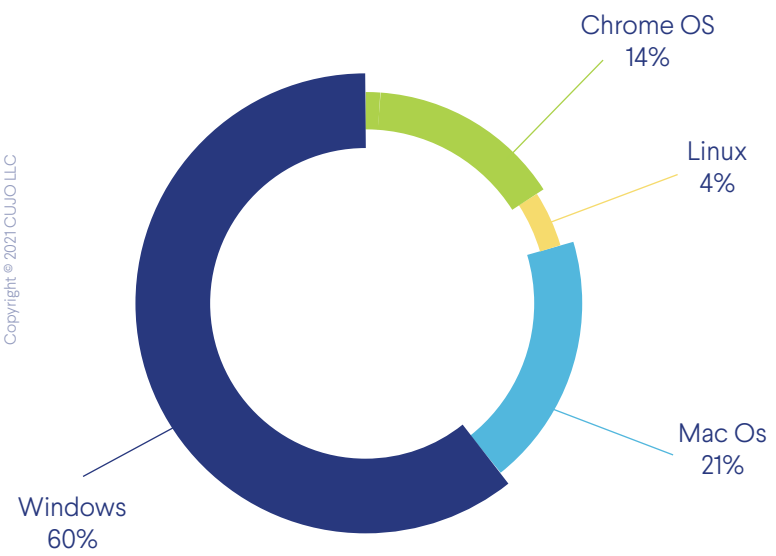
22%-25% is a good benchmark for the percentage of new devices that are computers, as seen in the start-of-the-month data for February and March 2020. However, as the lockdowns became stricter by the end of March 2020, computers made up a larger percentage of new devices on consumer networks, increasing from 24.5% in February to 29.1% and 29.4% by the start of April and May 2020, respectively. A similar jump happened in August-September, likely due to the start of a new school year. Note: Data in the graph shows device percentages at the start of the month.

Computer Category Breakdown by OS Type

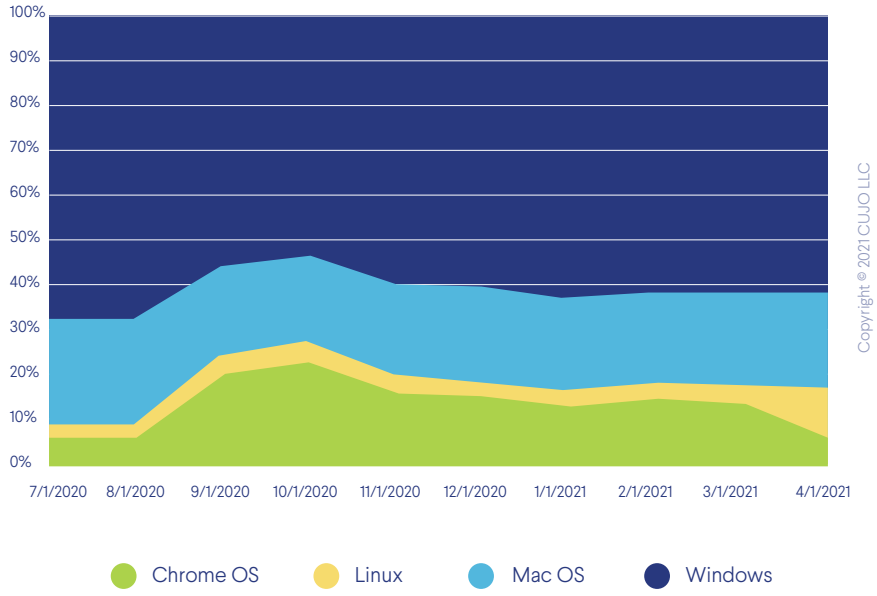
As far as the distribution of the OS types in the North American computer ecosystem, Windows has continued to maintain its dominance. It had a share of 59%, followed with Mac OS with 20%, Chrome OS by 14%, and Linux and Android with 4% and 0.6%, respectively.

There was a notable increase in Chrome OS usage as Chromebooks were rolled out for distanced learning. The impact was especially notable around August and September, at the start of the new school year.

DISTRIBUTION OF COMPUTER OPERATING SYSTEMS, APRIL 2021



SIGNIFICANTLY MORE NEW CHROME OS COMPUTERS WENT ONLINE AT THE START OF THE 2020/2021 SCHOOL YEAR



Seeing how computers are already present in most homes, the largest changes in their relative popularity were related to work or schooling. With more wearable and other IoT devices, personal computers will very likely make up an even smaller segment of the Internet.

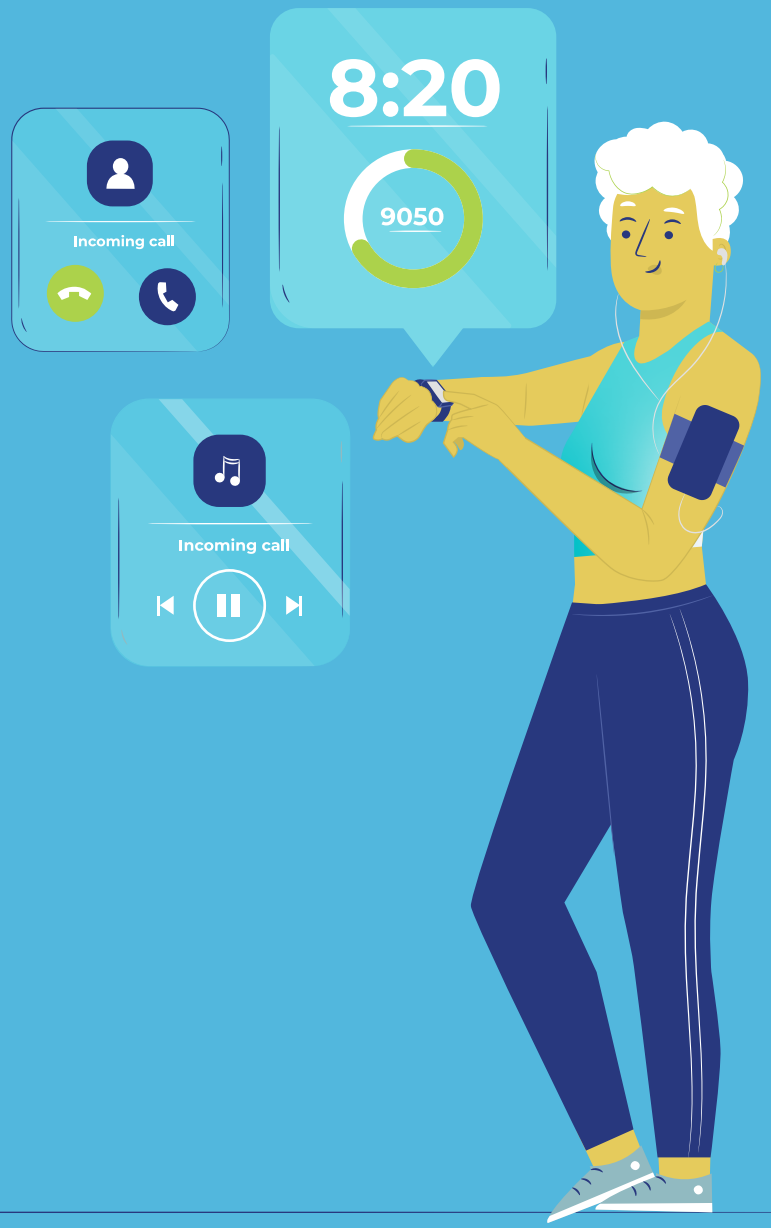
A Rising Star: Smart Watches

The Internet went from the computer age to the mobile age, but there are some signals that we have another rapidly growing connected device segment—wearables, notably smart watches.

> ***In 2020, smart watches were one of the fastest growing device categories in North America.***

Smart watches have been around for many years, yet these devices have seen much slower adoption rates due to battery size and overall functionality. Nevertheless, in 2020 smart watches were some of the fastest growing devices in North America, as their popularity experienced several spikes.

Overall, smart watches are third among the most popular categories of devices and the only truly wearable device.



Smart Watch Ecosystem Breakdown: It's All Apple

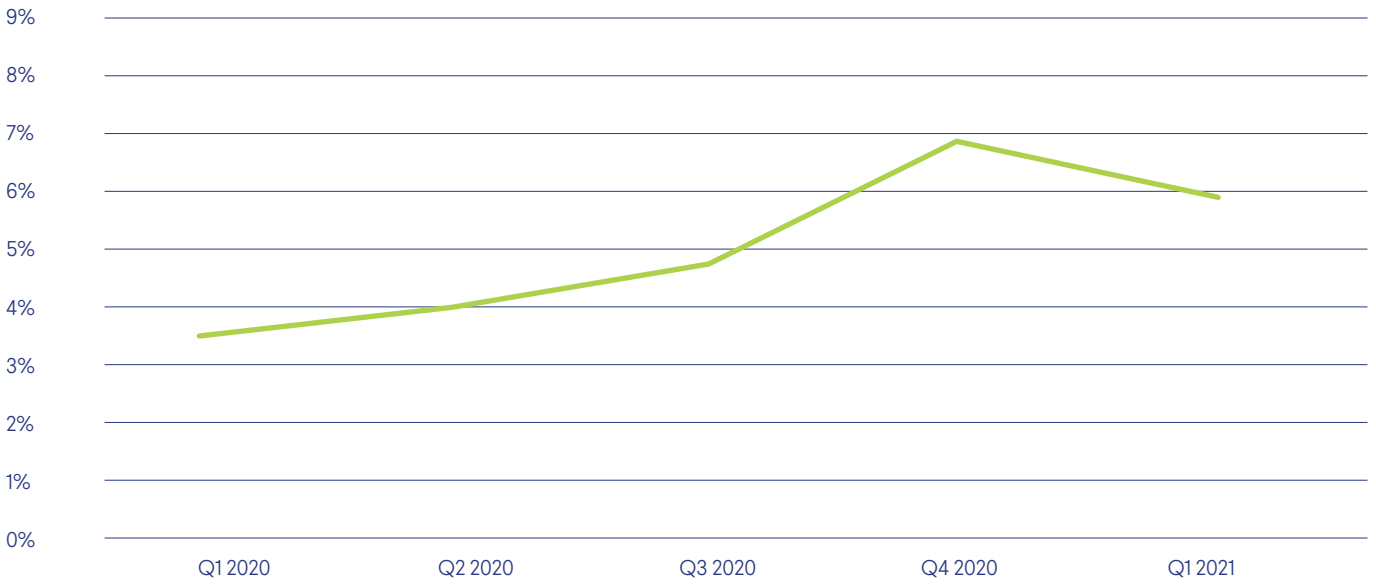
SMART WATCH DISTRIBUTION BY BRAND, APRIL 2021

Apple leads the smart watch category with over 80% of the market in the US and Canada.

The newes Samsung smart watch release did not move the needle in market share, as even more Apple Watches went online at the time. Apple leads the smart watch category with over 80% of the market in the US and Canada. This distribution corresponds with the data we see in mobile devices, where Apple has most of the market. It is also true that Apple device interoperability is a key factor for adoption, when we consider the number of distinct brands that offer Android phones and not necessarily smart watches. A notable mention goes to Fitbit, which focuses on the health and fitness sector to hold 2%-3% of the market.

Last year, smart watches were one of the most popular purchases at the end of the year, with 40% rise in popularity. Share of new connected devices shows that smart watches are gaining popularity.

SMART WATCHES AS A PERCENTAGE OF ALL NEW CONNECTED DEVICES IN JANUARY 2020 - APRIL 2021



Smart watches were one of the most popular purchases at the end of 2020, with 40% rise in popularity.

As smart watches gain wider adoption, it is completely possible that the market will reach enough maturity to become **the next breakout device type**. Watches are currently the most popular IoT devices, already seeing adoption close to that of mobile tablets.

The Covid Effect

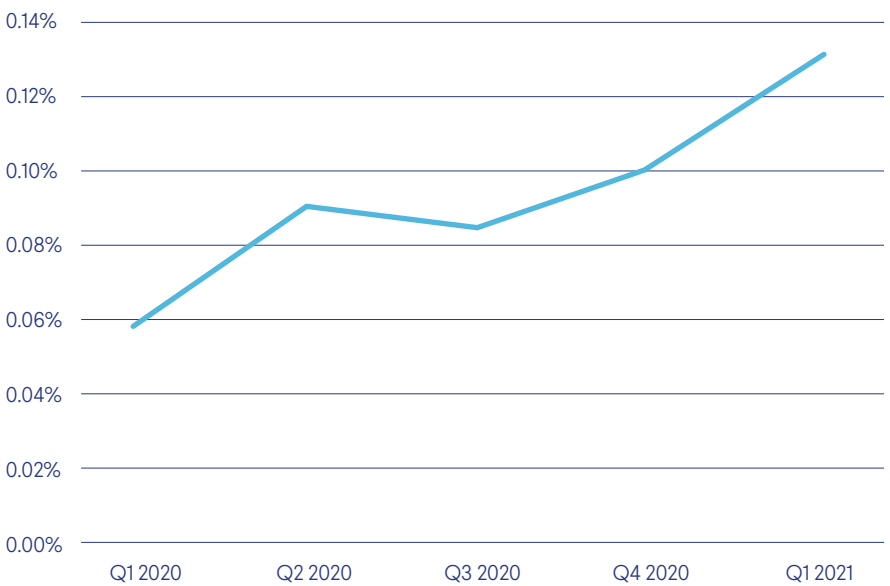
2020 was a truly unique year, and the changing daily habits of consumers were clearly visible in the types of devices they bought and used throughout the year. In our other reports, we have noted how the threats to home networks changed as people started working from home and home networks became more valuable targets from March onward.

> ***Changing daily habits of consumers were clearly visible in the types of devices they bought and used throughout the year.***

The 1st quarter (Q1) of 2020 saw a notable popularity boost for several smart device categories, which we present in this section.

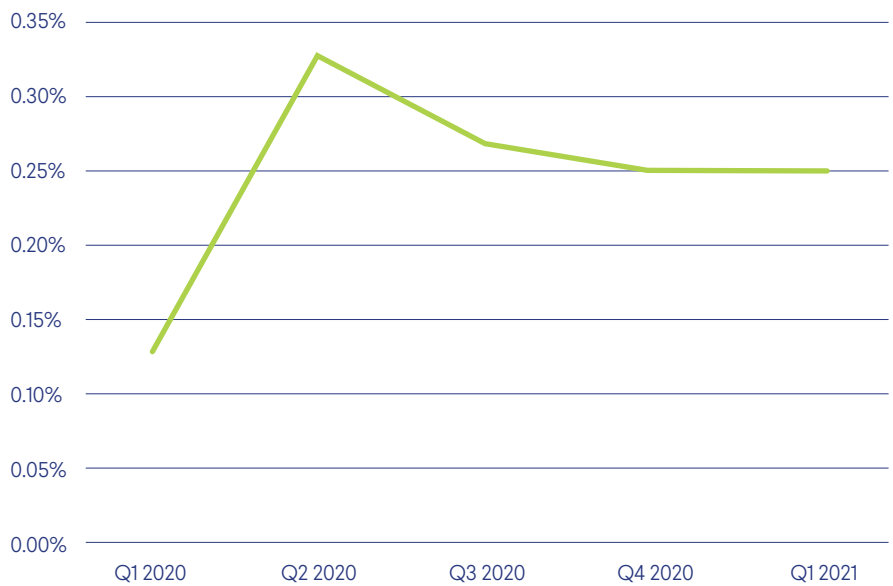
Sports and fitness devices – Gym lockdowns and more time at home did not stop people from exercising, and we saw an increase in smart fitness and sports devices connected in March 2020 onward. An overall increase of 50% in popularity, fitness and sports devices show how a significant change in the daily habits and living conditions impact the online smart device ecosystem.

SPORTS & FITNESS DEVICES, PERCENTAGE OF ALL NEW CONNECTED DEVICES, JANUARY 2020 - APRIL 2021



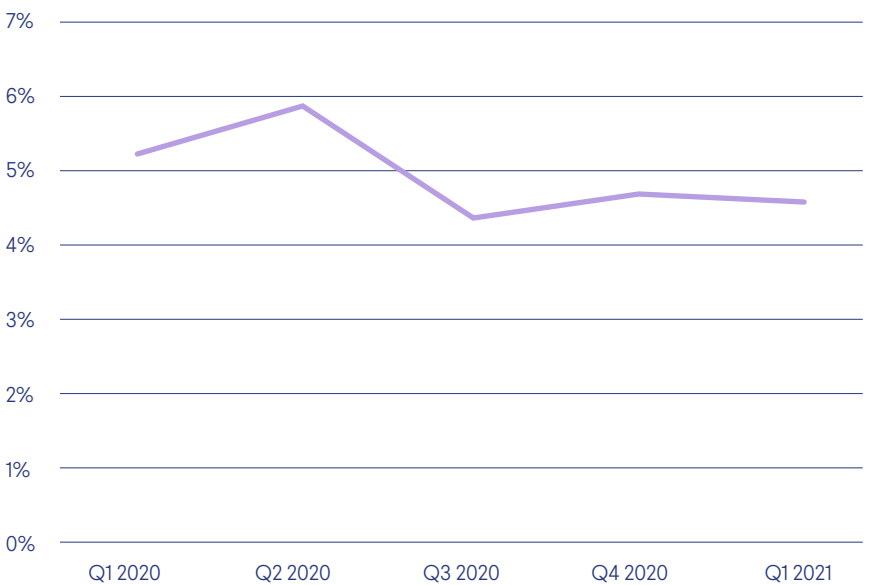
E-readers had a massive +150% increase in Q2 2020. Making up a very small portion of the overall device population (0.3%), this jump in e-reader popularity was quite significant yet did not create any lasting trend in the year since.

E-READERS, PERCENTAGE OF ALL NEW CONNECTED DEVICES, JANUARY 2020 - APRIL 2021



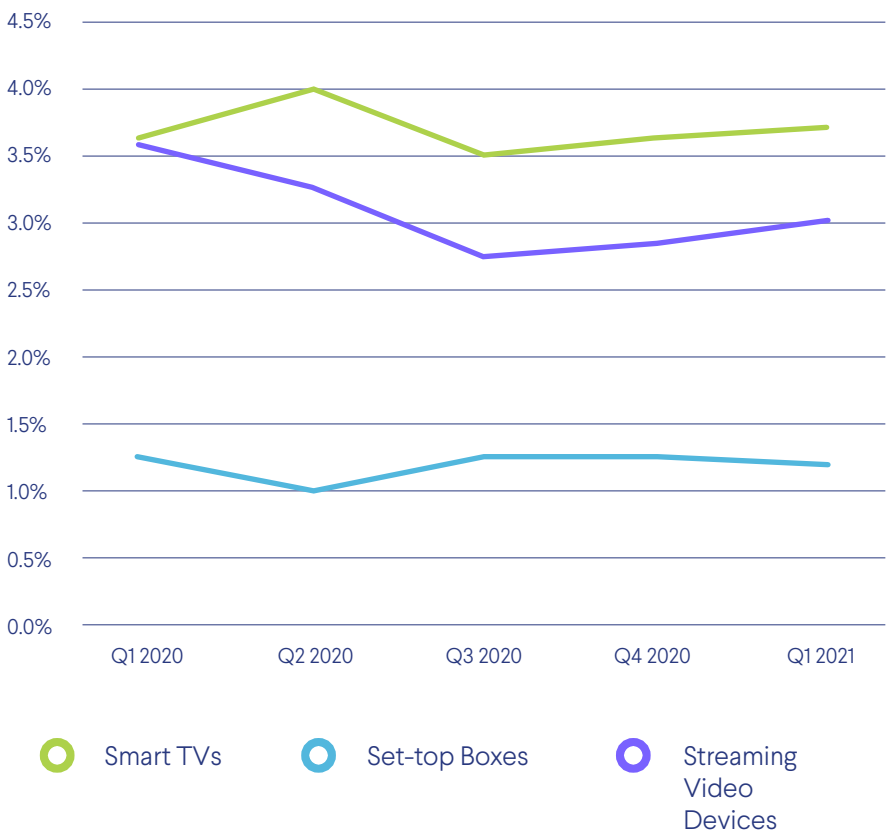
Gaming consoles had a good Q2, 2020 with an overall boost of close to 19%. Newly released consoles did not create a market shift yet, but the holiday season did bring more gaming devices online. See the gaming section for more insights about the gaming device ecosystem.

GAMING CONSOLES, PERCENTAGE OF ALL NEW CONNECTED DEVICES, JANUARY 2020 - APRIL 2021



Smart TVs, streaming video devices and set-top boxes had a stable portion of the market without much fluctuation during the peak of the pandemic, except an initial boost in streaming video device connectivity. It seems that most households already had smart TV setups and multimedia devices, signaling a clearly saturated market.

SMART TVS, SET-TOP BOXES AND STREAMING VIDEO DEVICES, PERCENTAGE OF ALL CONNECTED DEVICES, JANUARY 2020 - APRIL 2021



Winter Holidays Made a Difference for Some Device Types

Connected device population shows consumer buying habits. We can determine the desirability of a category by new devices coming online in Q4, combining winter holiday presents with Black Friday and Cyber Monday purchases. We will use several real-world examples of smart device trends to show how their adoption increased in Q4 2020.

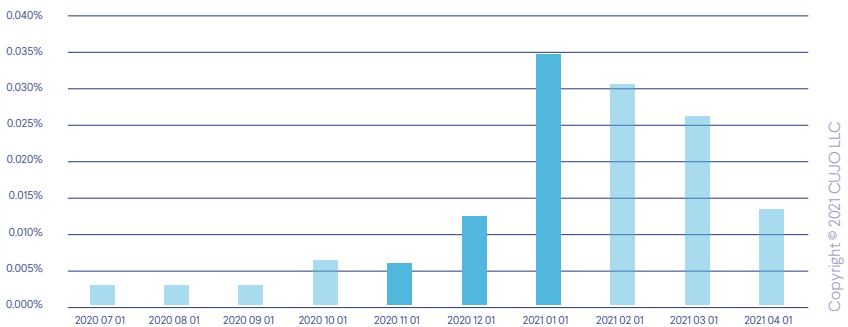
We can determine the desirability of a category by the number of new devices coming online in Q4 2020, combining winter holiday presents with Black Friday and Cyber Monday purchases.

Sales and Winter Holidays: What Did People Really Buy?

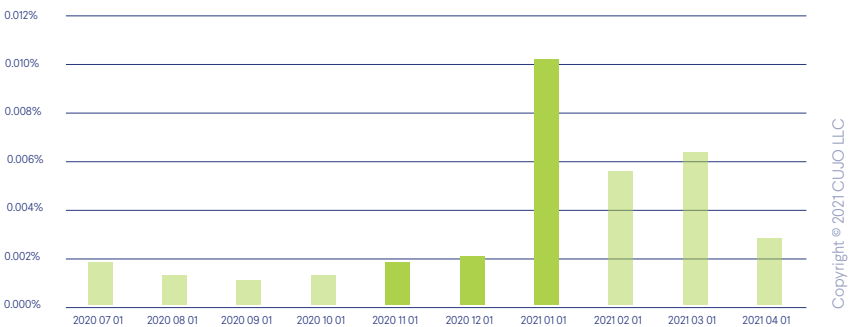
There were several device categories that experienced a significant increase in popularity during Q4 2020, so we looked at which device categories experienced the largest increases in popularity among new devices during the holiday season. Monthly data shows that some devices experienced extremely large jumps in popularity after the winter holidays.

We picked four categories to demonstrate the holiday season's impact on new device connections. Two of them–**smart clocks and photo frames**–were clear outliers that had massive increases in new connections. The other two–**voice control appliances and baby monitors**–were also positively impacted by the holiday season but had smaller upward momentum.

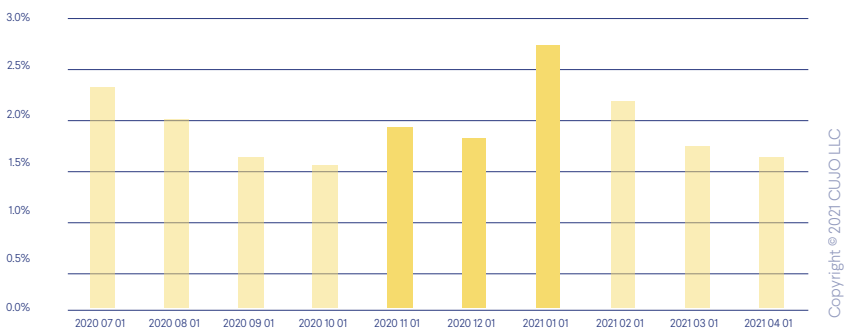
*HOLIDAY SEASON IMPACT ON THE **SMART CLOCK** POPULATION*
(PERCENTAGE OF ALL CONNECTED DEVICES, JULY 2020 - APRIL 2021)



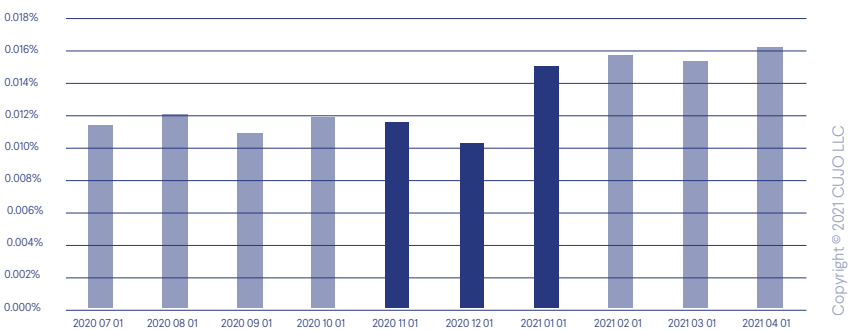
*HOLIDAY SEASON IMPACT ON THE **SMART PHOTO FRAME** POPULATION*
(PERCENTAGE OF ALL CONNECTED DEVICES, JULY 2020 - APRIL 2021)



*HOLIDAY SEASON IMPACT ON **THE VOICE CONTROL APPLIANCE** POPULATION*
(PERCENTAGE OF ALL CONNECTED DEVICES, JULY 2020 - APRIL 2021)



*HOLIDAY SEASON IMPACT ON THE POPULATION OF CONNECTED **BABY MONITORS***
(PERCENTAGE OF ALL CONNECTED DEVICES, JULY 2020 - APRIL 2021)

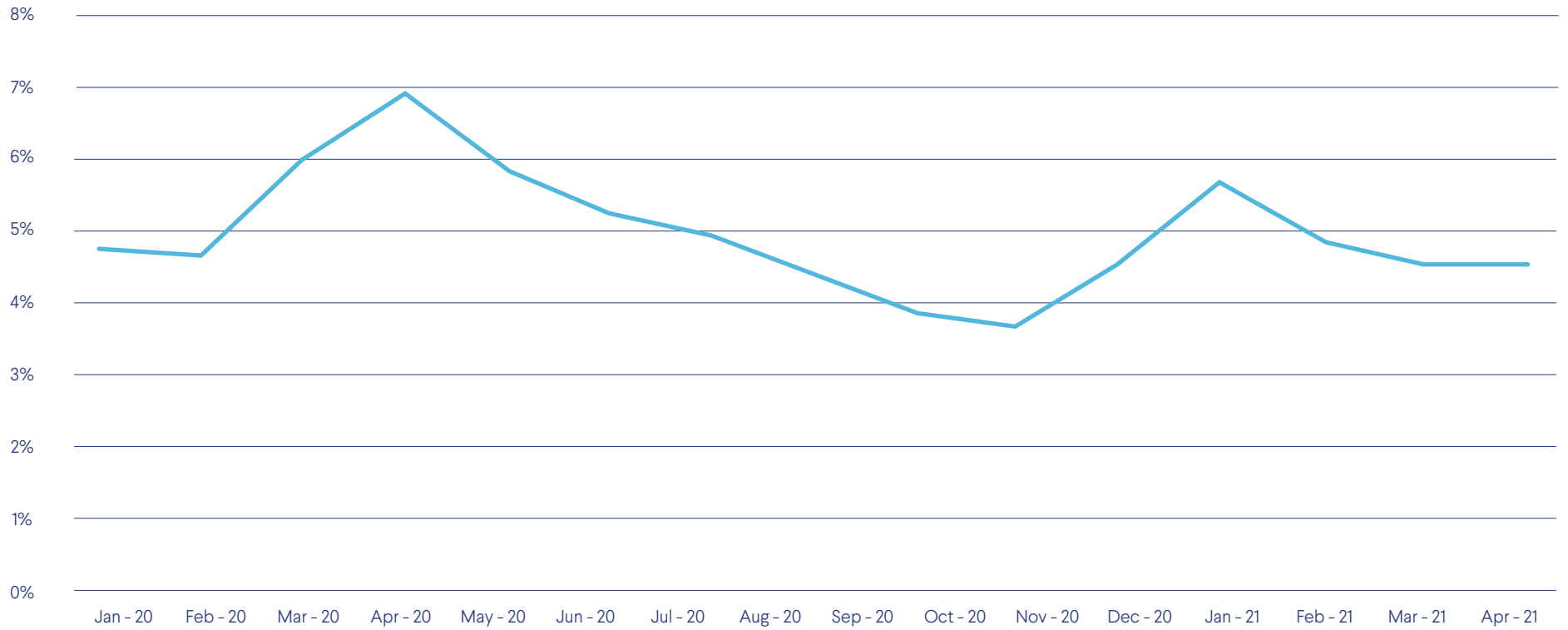


The Gaming Ecosystem

This section reviews gaming console and VR headset trends. While we realize **VR headsets have a wider adoption than just gaming**, the correlating trends in our data suggest that the drivers for these devices are quite similar. Note that our data reflects connected devices and is thus strongly biased toward standalone VR headsets.

Gaming Console Ecosystem Under the Magnifying Glass

GAME CONSOLE POPULARITY SPIKES (PERCENTAGE OF ALL NEW CONNECTED DEVICES), JANUARY 2020 - APRIL 2021

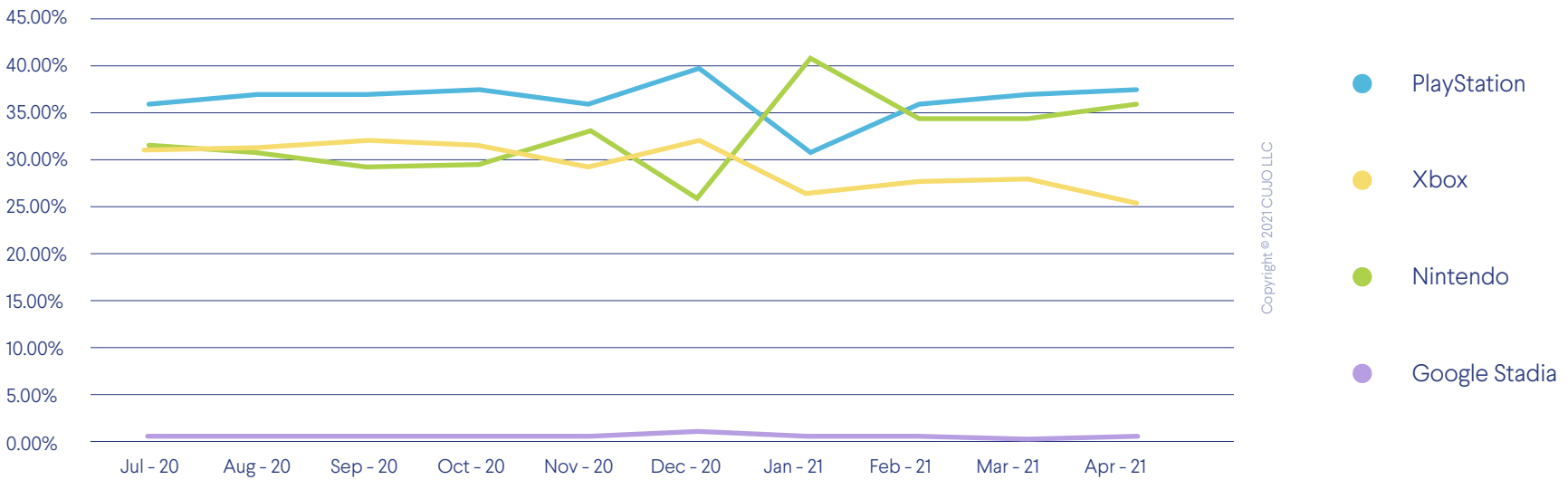


Gaming consoles experienced two surges in popularity in the last 15 months: The first one happened when the quarantine started and a second one with the end of the year sales and holidays. While there are only a few leading console brands, their market penetration is quite significant, making gaming consoles some of the more common connected devices on home networks.

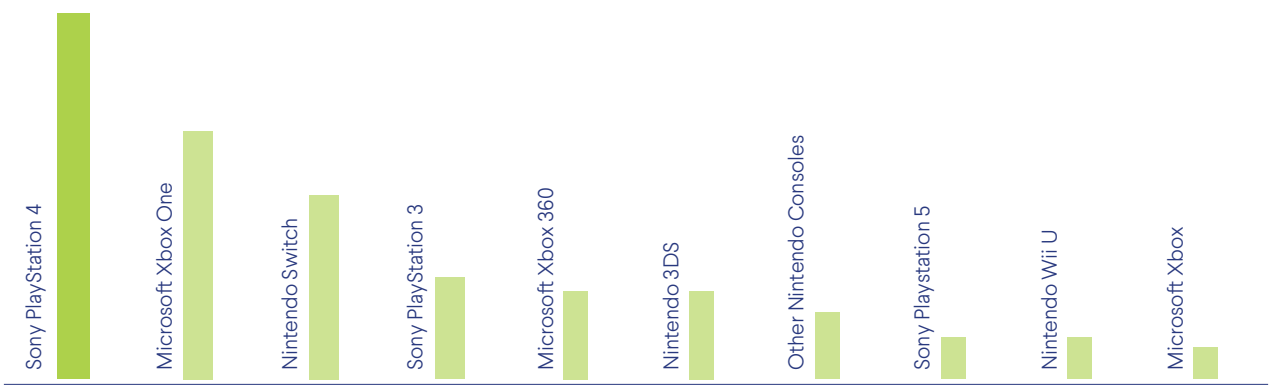
Gaming consoles experienced two surges in popularity in the last 15 months.

When we look at the distribution of gaming consoles, we see that Nintendo has significantly boosted its market share to overtake Xbox and is now contending with Sony for the most-used gaming console brand in the US.

MOST POPULAR GAMING CONSOLES IN NORTH AMERICA, JULY 2020 - APRIL 2021



Our device distribution data also shows that the PlayStation 4 is by far the most popular gaming console, while the new PS5 has seen low usage due to unit shortages and scalpers buying up the stock and not using the devices themselves.



TOP 10 GAMING CONSOLES BY POPULARITY, NORTH AMERICA, APRIL 2021

The PlayStation 4 is by far the most popular gaming console.

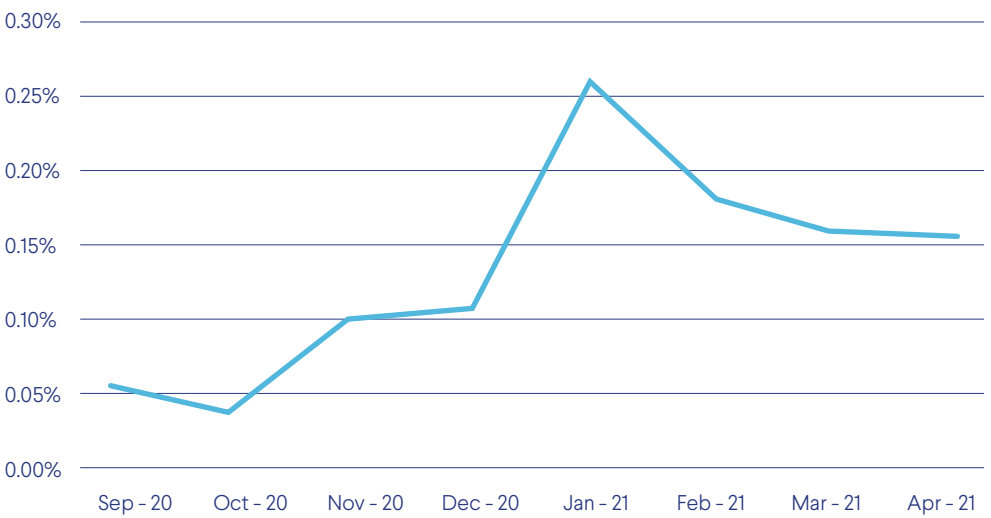
Virtual Reality Headset Trends

Standalone VR has experienced growth and increased adoption in recent years, and the largest brand that is responsible for this is Facebook's Oculus, which has solid reviews and seems like a good value for early adopters.

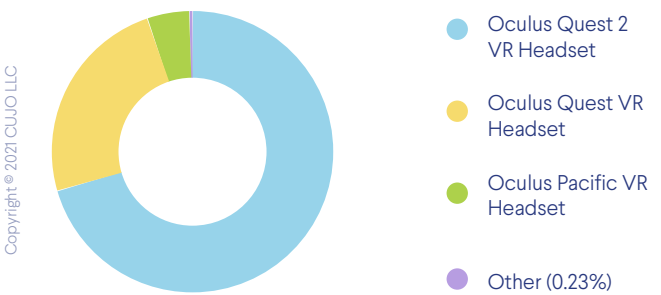
Our data shows that VR headsets are growing in popularity, and a major increase of VR headsets happened after the winter holidays as VR device popularity almost tripled.

VR headsets are growing in popularity, and a major increase of VR headsets corresponded to the initial lockdown in 2020.

VR HEADSET POPULARITY, PERCENTAGE OF ALL NEW DEVICES, NORTH AMERICA



STANDALONE VR HEADSET BREAKDOWN BY DISTRIBUTION, NORTH AMERICA, APRIL 2021



Facebook's new Oculus Quest 2 is the de facto dominating force in connected VR headsets. Facebook currently covers over 99% of the connected standalone headset market.

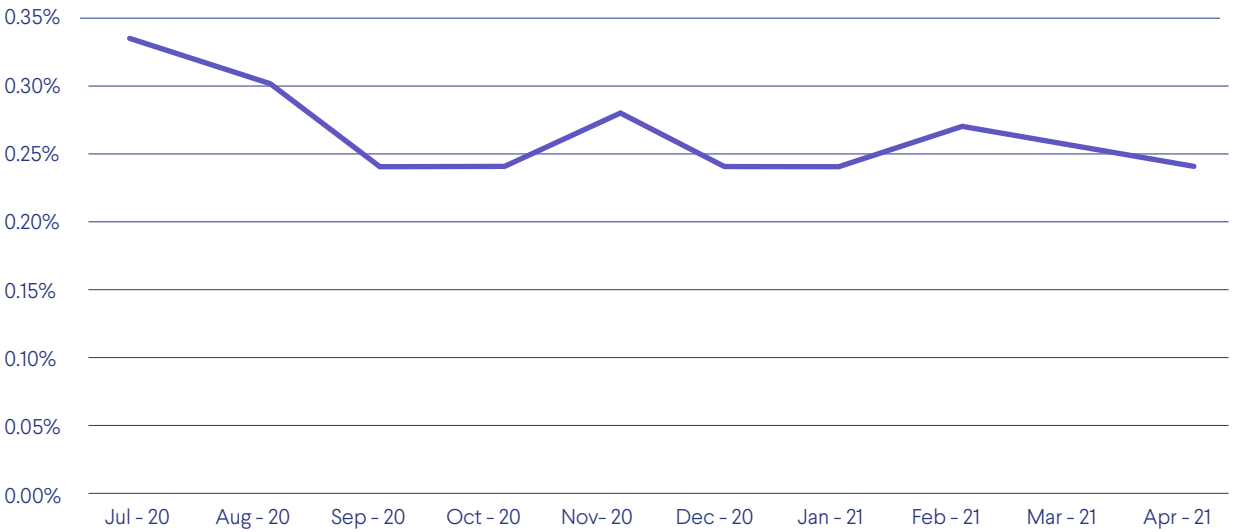
Inside the Smart Home (IoT Devices)

Smart homes are an ever-evolving concept that may work as unified systems of devices or loosely related solutions. While most households have over a dozen devices, they do not necessarily use voice controllers to manage their home temperature through smart thermostats. There are some devices that are quite popular, and this section reviews interesting smart devices and leading models in that space.

Smart Thermostats

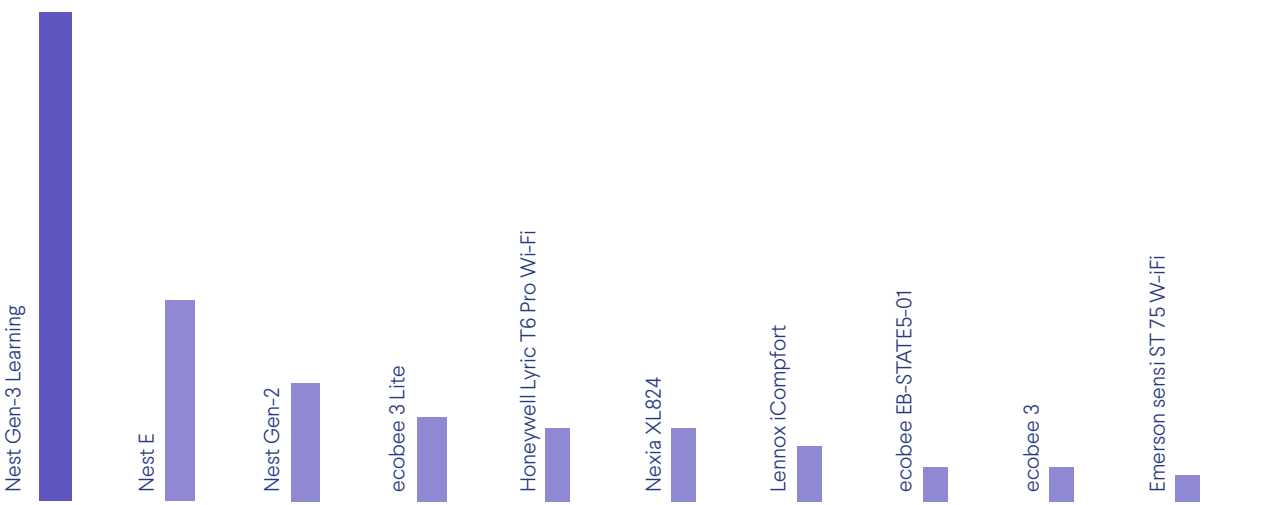
Keeping people cooler or warmer with smarter dynamic controls, smart thermostats have a stable, established segment in the smart home ecosystem that did experience a nominal decrease in popularity over the last few months.

SMART THERMOSTAT POPULARITY, PERCENTAGE OF ALL NEW CONNECTED DEVICES, NORTH AMERICA, JULY 2020 - APRIL 2021



In terms of the most popular smart thermostat models and makers, Google's Nest, ecobee and Honeywell are the most popular brands on the market.

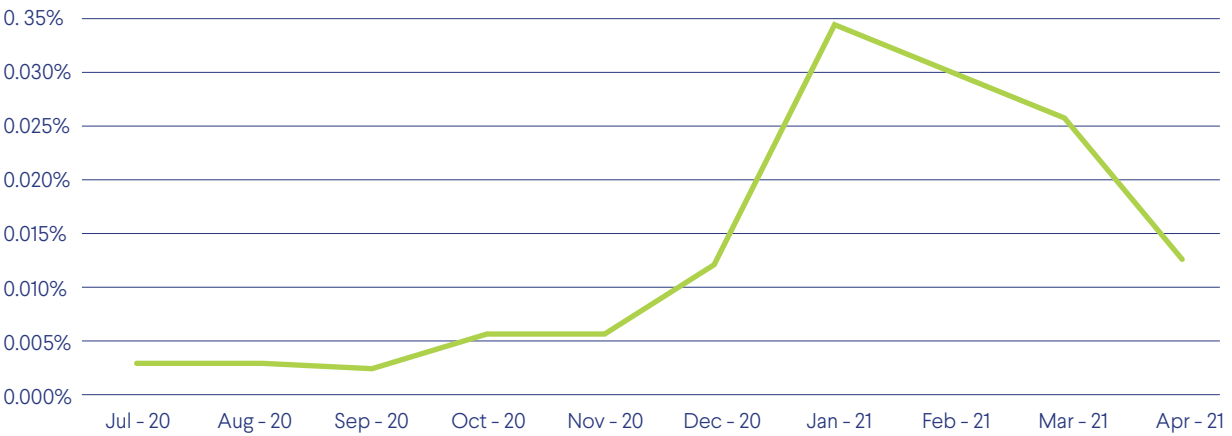
TOP 10 SMART THERMOSTATS BY DISTRIBUTION, NORTH AMERICA, JULY 2020 - APRIL 2021



Smart Bedroom Devices

We've already noted that **smart clocks** had a boost in popularity after the winter holidays, and Lenovo is the clear leader in this space:

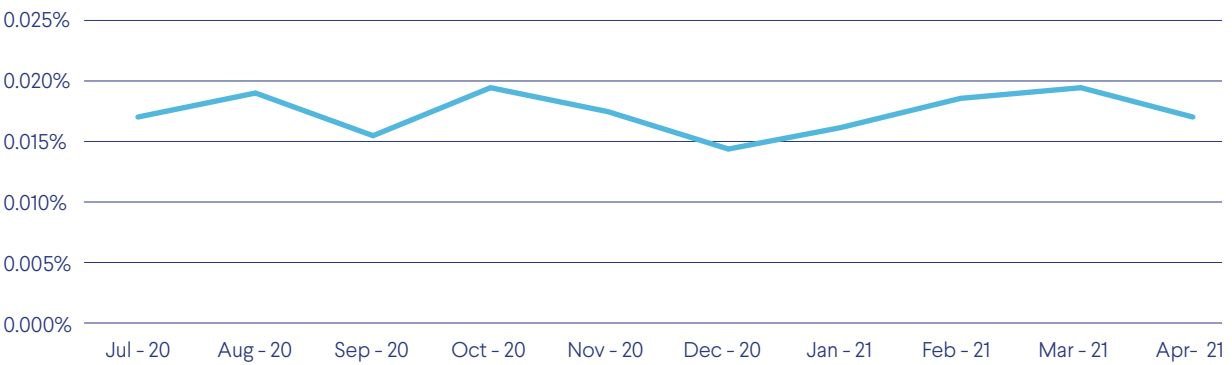
SMART CLOCKS AS A PERCENTAGE OF ALL NEW CONNECTED DEVICES, NORTH AMERICA, JULY 2020-APRIL 2021



TOP 5 SMART CLOCK BRANDS, NORTH AMERICA, APRIL 2021

Smart beds are some of the more peculiar smart devices, with Sleep Number being a clear leader in the space with over 93% of smart beds in the ecosystem.

SMART BEDS, PERCENTAGE OF ALL NEW CONNECTED DEVICES, NORTH AMERICA, JULY 2020 - APRIL 2021



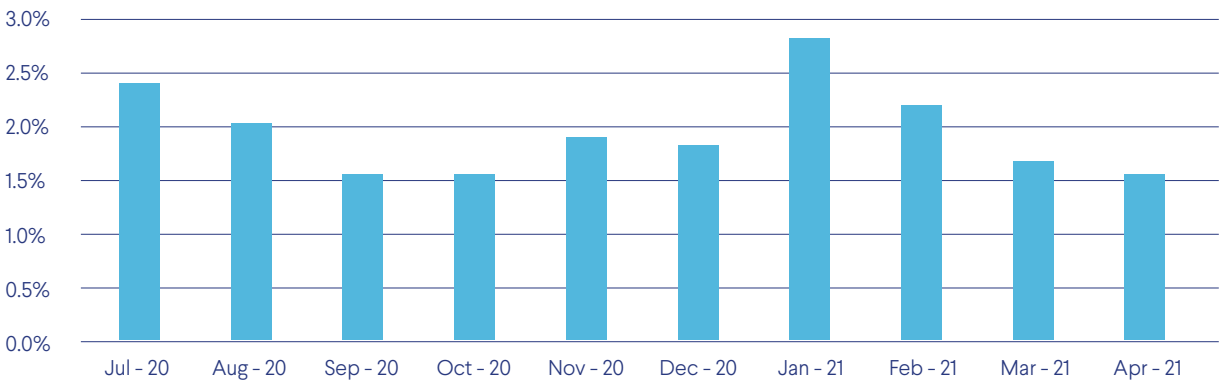
Voice Controls

According to our data, Amazon's Alexa is dominating the voice control space in the US.

MOST POPULAR VOICE CONTROL DEVICE BRANDS, NORTH AMERICA, APRIL 2021

- Google
- Amazon
- Facebook
- Lenovo
- Apple
- Insignia

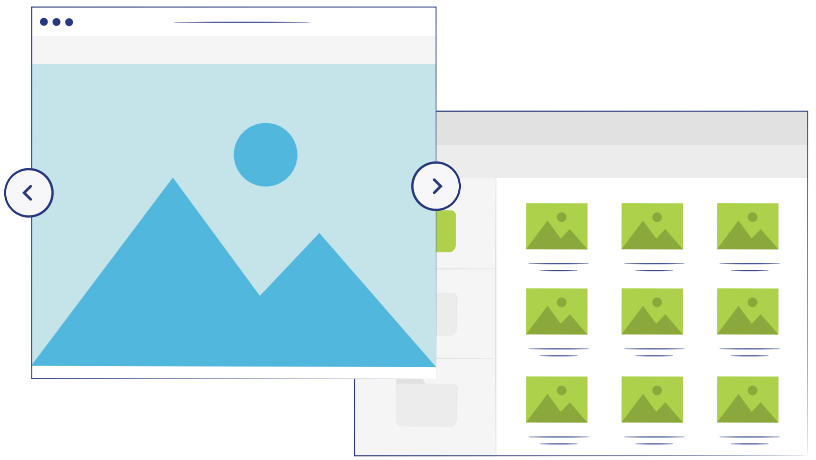
The popularity of voice control devices has seen a boost in Q4 2020, making it one of the most popular smart presents of 2020.

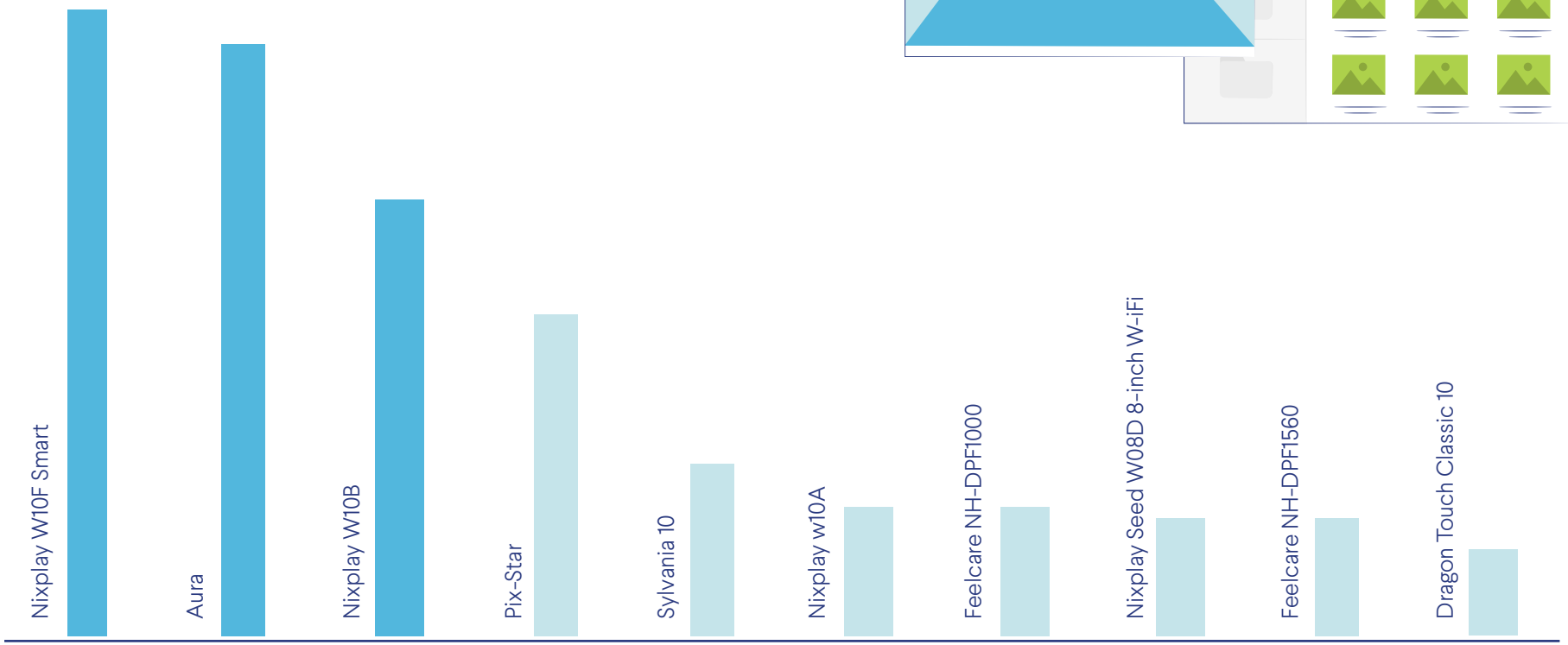


VOICE CONTROL DEVICE POPULARITY, PERCENTAGE OF ALL NEW CONNECTED DEVICES, JULY 2020 - APRIL 2021

Smart Photo Frames

An exotic IoT device that got a lot of new users last year is the smart photo frame, which allows people to connect their external (e.g. cloud storage) photos with the frame in their home. Several brands are strong in this market niche, making this an interesting category to watch in the near future.



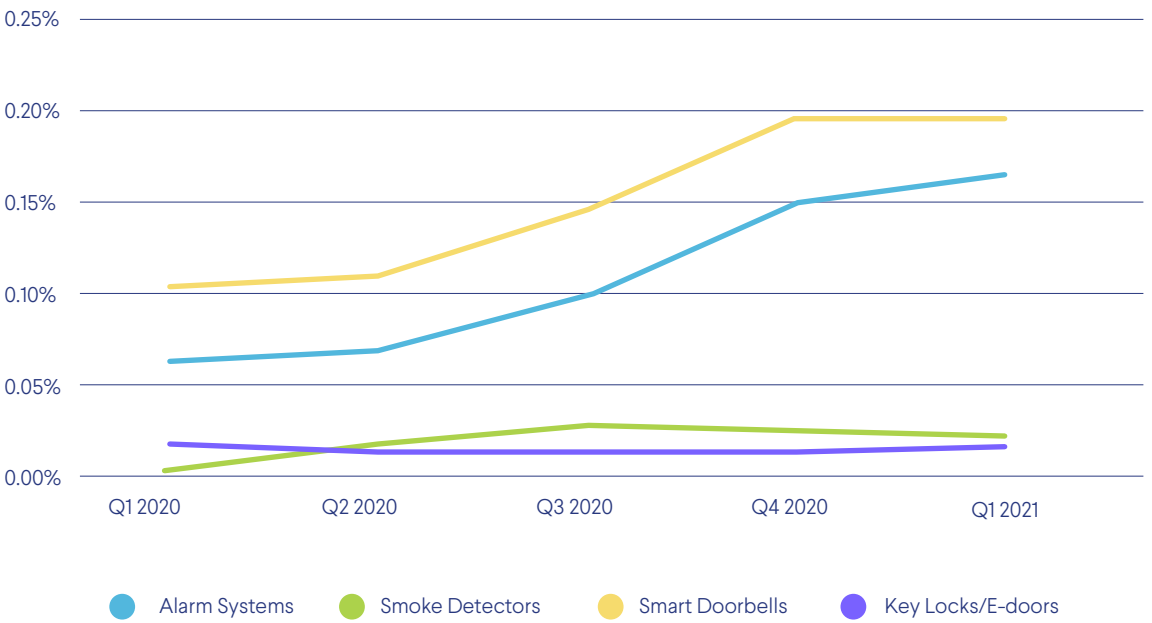


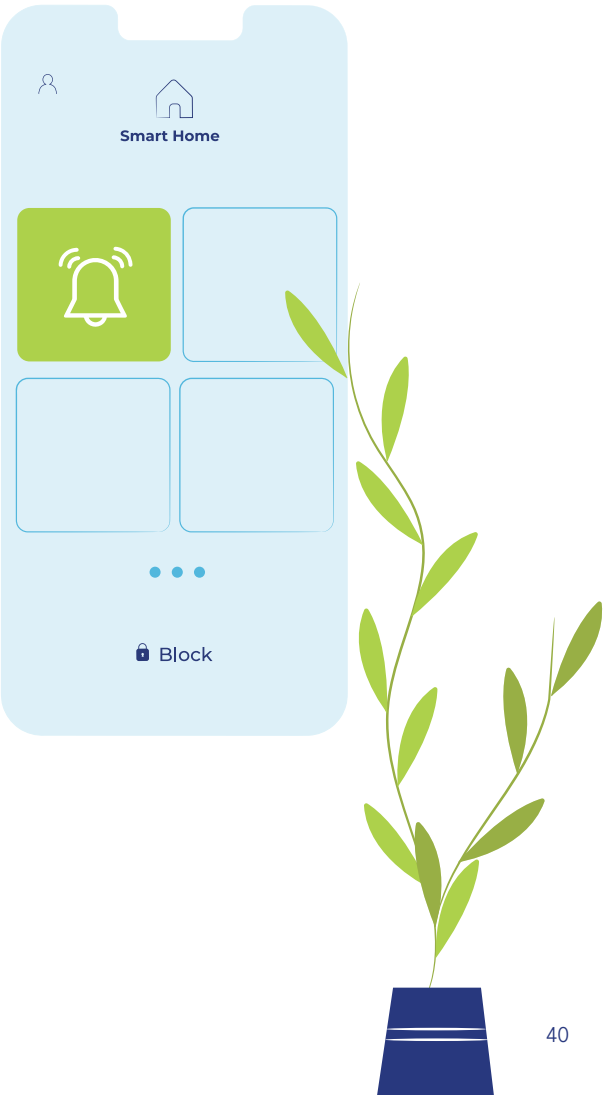
TOP 10 MOST POPULAR SMART PHOTO FRAMES IN NORTH AMERICA, APRIL 2021

Some Smart Home Safety Devices Are Gaining More Popularity

There are several categories of smart home safety devices, and the four we chose to present had similar adoption rates at the start of 2020. Nevertheless, our data shows that smart alarm systems and doorbells are becoming more popular, close to doubling their quarterly new device numbers. On the other hand, connected smoke alarms and smart key locks have small and stable niches in the connected device ecosystem.

SMART HOME SECURITY DEVICE POPULARITY, PERCENTAGE OF ALL NEW CONNECTED DEVICES, NORTH AMERICA, JANUARY 2020 - APRIL 2021

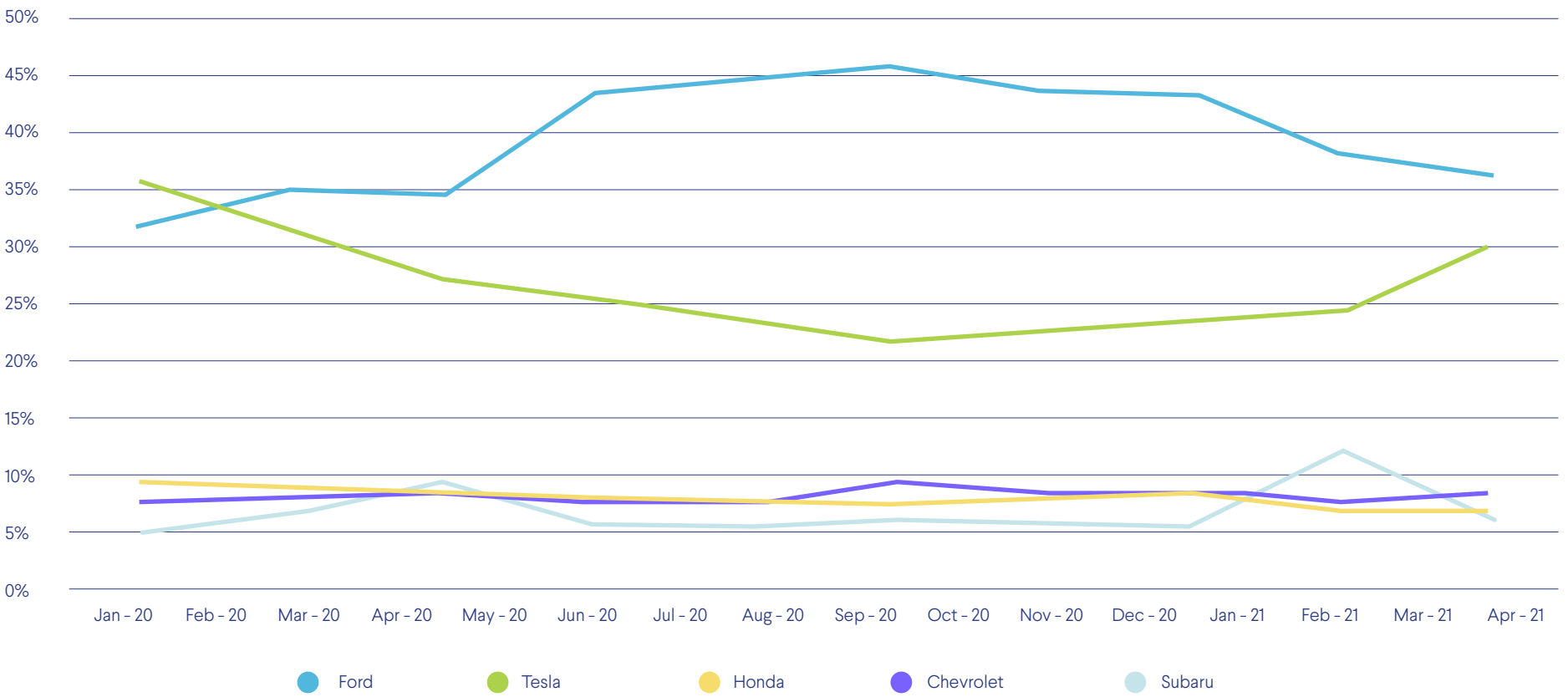




In the Garage: Ford Took the Lead in Connected Cars in North America

Still niche among connected devices (only 0.05% distribution), connected cars are slowly gaining traction, and two manufacturers are competing for the lead: Ford and Tesla. Ford has been the more popular connected car brand since last summer, while other manufacturers are struggling to carve out a significant portion of the market, with Subaru being the only other manufacturer that had any significant increases in new connections since July 2020.

TOP 5 MOST POPULAR CONNECTED CAR BRANDS IN NORTH AMERICA, PERCENTAGE OF ALL NEW CONNECTED CARS, JANUARY 2020 - APRIL 2021



CONCLUSION

The overall connected device ecosystem is diverse, even if mobile (phone and tablet) devices and computers still make up more than half of all connected devices. Over two dozen distinct device categories represent at least 0.5% of the device population each, with large fluctuations in device popularity corresponding to global events as well as seasonal changes. The IoT is a rapidly evolving ecosystem of devices from smart watches to photo frames. This ecosystem fluctuates with new model releases, has some niches that look like monopolies and has a very interesting "long tail" of niche devices.

The rapidly changing device landscape poses significant challenges to Network Service Providers (NSPs) that need to adapt their network management solutions and discover potential issues or threats as quickly as possible. Device inventories and knowledge of emerging trends is a key part of the cybersecurity puzzle for NSPs, and artificial intelligence solutions used in CUJO AI Explorer provide a significantly more detailed view of what is happening on a network.

Our data shows that major events, sales and the winter holidays really impact the popularity of some device types, while other devices do not gain any significant popularity despite new model releases. There are some interesting marketing takeaways too, as data from 2020 suggests that new device releases throughout the year might not reach their peak sales until the holiday season in Q4.

Oddly enough, the gaming console category shows how a single leading model does not ensure dominance in the field: Even though PlayStation 4 is the most popular device in the market, the limited availability of the brand-new PlayStation 5 allowed Nintendo to gain a larger market share of gaming devices in actual use at the start of 2021.

The technologies that made this report possible are already being used by leading NSPs to empower data-driven business decisions and new product offerings as well as full home network visibility and advanced management options for end users through customer-facing native applications.

The rapidly changing device landscape poses significant challenges to Network Service Providers, Providers that need to adapt their network management solutions and discover potential issues or threats as quickly as possible.

The technologies that made this report possible are already being used by leading NSPs to empower data-driven business decisions and new product offerings.

About CUJO AI

CUJO AI provides advanced multilayered cybersecurity and network intelligence solutions for Internet service providers, which allows them to protect end users' devices and home networks. Major mobile and broadband providers partner with CUJO AI to offer security as a core service to their clients. Thanks to a unified approach that encompasses AI algorithms and an unmatched scale of its database, the company's products have a proven positive impact on their partner telecom revenue streams and customer retention. As the only comparative platform deployed to monitor over 1 billion devices, CUJO AI offers the most advanced AI algorithms to help its clients uncover previously unavailable insights about devices on their networks. Data processed by these algorithms is in full compliance with all privacy regulations.

More information: **connect@cujo.com**
Media inquiries: **press@cujo.com**

About CUJO AI Labs

CUJO AI Labs is an advanced research department of CUJO AI that specializes in IoT threat research and NSP customer cybersecurity. Labs researchers use the largest scale real-world device behavior database of over 1 billion anonymized consumer devices to empower advanced machine learning technologies that protect tens of millions of households around the globe. Every year, CUJO AI Labs publish in-depth data-based reports, such as this one, on the IoT ecosystem and cybersecurity.

CUJOAI

cujo.com