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## Fixing the Great CPE Divide

By: [Jason Moore](#)

Over the last two decades, we've watched the world adopt a digital-first mindset. Once a luxury, the Internet is now a necessity. And while we were well on our way to a more connected universe before the pandemic, COVID-19 forced us to adapt to a new era of home offices, remote education, and video meetings—all of which placed additional strain on in-home networks.



During this adaptation, residential Internet usage skyrocketed, and domestic Internet Service Providers (ISPs) had to shoulder the burden of supporting this heavy usage. Because this change came about in a relatively rapid fashion, rather than gradually or at least on a pace on par with past adoption of Internet-enabled devices, many ISPs were unprepared for the high volume of additional usage placed on their systems. The fact that many ISPs managed the shift successfully with relatively few disruptions is a testament to their ability to adapt to new stressors, and to the quality of their infrastructure.

This increase in usage, though, revealed the technological hurdles that ISPs with even the most stable infrastructure need to overcome to meet and exceed subscriber expectations. This is because the problem isn't necessarily one of ISP infrastructure; rather, it's one of an overloaded in-home environment.

Many ISPs have made efforts to support the in-home experience and resolve WiFi connectivity issues. These solutions often focus on gaining visibility into the home—or at the very least, the router. Often, the solutions ISPs have found for supporting the in-home environment rely on some form of customer premise equipment (CPE), meaning ISP-provided hardware that provides the ISP with valuable information about the in-home network. On paper, CPE is a decent fix; it's given ISPs the visibility into the home they were after. But simultaneously, it's created a new

problem. Over time, CPE has slowly but surely fragmented ISPs' customer bases, adding to the challenge of supporting the in-home environment.

## **The fate of connectivity lies in the home**

In our new digital-first world, it isn't just computers and laptops online anymore. It's our doorbells, speakers, phones, watches, fridges, thermostats, stationary bikes, and in some cases even our toothbrushes. And then there is the growing crop of devices made to manage these smart devices, adding device on top of device, and creating an interconnected web of devices competing for bandwidth. In fact, modern households have an average of more than 10 connected devices, and this number is only going up as manufacturers see an ongoing demand for WiFi-enabled smart devices of every size, shape, and function.

With more devices and more usage come more issues and more calls into support organizations. Every smart device carries its own risk for malfunction, but homes loaded with these devices tend to run into bandwidth issues. As home Internet networks get clogged with more and more devices, overall connection reliability and stability goes down. It's like traffic on a freeway: when you're the only car on the road you can go as fast as you want, but when it's rush hour you're suddenly at the mercy of available asphalt. Each device takes up a little more of the digital roadway in the home, especially when outdated routers or WiFi networks made to support five or six devices are suddenly supporting twice as many.

The average ISP customer, however, isn't going to realize that their favorite streaming service keeps freezing up because their smart fridge and their smart water bottle are currently hogging all the in-home bandwidth. They're just going to blame their ISP for sub-par connection, despite it not being the issue at all.

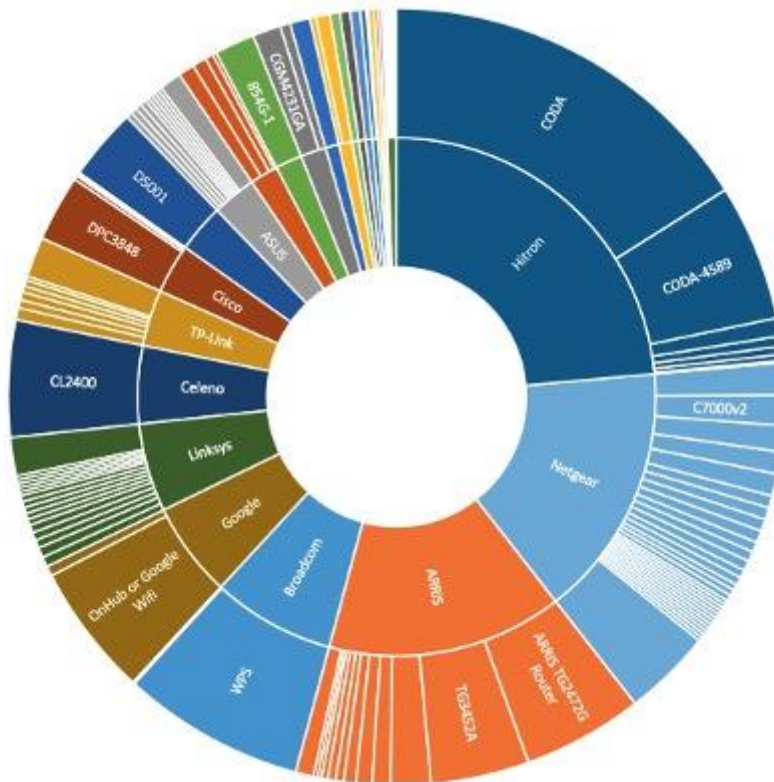
This is really the crux of the matter: while a strong infrastructure helps deliver the connection these devices need, it alone won't keep customers connected. It needs to be paired with an optimal in-home environment and, unfortunately, that's exactly where things go wrong for consumers today.

## **How CPE fragments customer bases**

CPE fragmentation has happened in gradual steps, from moves to new hardware vendors, equipment updates from existing vendors, and big tech marketing their equipment directly to consumers. Throw in an acquisition or two, which comes with the acquired company's tech stack, and ISPs are left with a subscriber base whose CPE breakdown looks like Figure 1 (see below).

This fragmentation creates a massive problem for ISPs because suddenly it becomes nearly impossible to create any semblance of consistency in subscribers' experience. They have no consistent data about issues that happen within their subscriber base. There are simply too many

variables, too many different data points. Agents must ask too many questions and consider too many possibilities just to be able to solve an issue.



**Figure 1: CPE breakdown across subscriber base of North American ISP.**

Take an ISP that supports three different routers—let’s call them router A, B, and C—each of which have their own backend providing various levels of visibility into the customer’s network. Now every support call your agents take has 60 seconds of added time as your agents play trial and error trying to sort out which dashboard they need to go to for that customer. Attach that to the fact that each of those systems probably provides a different set of information; router A might have great per-device diagnostics while router B doesn't, for instance. Now you have a situation where, every call, the agent needs to invent a new troubleshooting process based on the diagnostics available. It's easy to see that the 'tax' you pay by having multiple systems (or, even worse, by not having them at all for certain cases) builds quickly, diminishing the benefits you originally sought. This lack of consistency ends in frustrating and unproductive support interactions and an overall poor customer experience. It also leaves support teams with little to no insight into what works best to resolve issues, so they can't work to alleviate the inconsistency. It's a vicious, self-perpetuating cycle.

What’s the answer?

As can only be expected in a digital-first world, hardware cannot be the answer. CPE has proven that it will only serve to split customer bases further and, short of a global mandate, will likely never reach any level of mass consistency.

The answer to this issue of fragmentation is software-based. It's in the data ISPs use. ISPs need solutions that help them override the fragmentation CPE has created, so they can access the right information about a customer's network using the same path every time, whether the customer is managed, has legacy equipment, or uses third-party gear.

By following a consistent path to get consistent information, ISPs can start to pull insights into their support organization. This translates into an ability to create standardized processes and standardized experiences, unlike the example above where you're constantly inventing processes based on the diagnostic info available. The result is that every single customer gets the best possible customer experience. Standardization isn't just good for the customer; it's good for the service provider. It means service technicians can get through support calls faster, as they have a format and template to follow. And with third-party software interfaces, technicians can often solve problems without needing to go on site to troubleshoot CPE in person. This creates huge savings in both time and money. Plus, these days it's always good to have a touch-free solution to rely on in any circumstance.

The problem is that, with so many variations in CPE, no ISP is going to be able to come up with a solution on their own. It's up to third-party applications to fit this need in the customer-ISP relationship by creating software that allows ISPs to interface quickly and easily with CPE regardless of make, manufacturer, or model. And it's up to ISPs to see the value in this technology and bring these third-party apps into their workflows.

Instead of being overwhelmed by a practically limitless variety of CPE, ISPs can interface with a single, consistent piece of software regardless of what hardware the customer has. Ultimately, this consistency pieces together fragmented customer bases. It bridges the gap between an ISP's infrastructure and a subscriber's in-home environment. It means less frustration for agents and customers and better customer experiences, regardless of a customer's network setup. It also means more business opportunities and increased market share, as impressed customers upgrade and refer new customers.

And it means that ISPs are well prepared to face—and conquer—any unexpected shifts the future has in store.