2022 predictions: Internet and network outages will continue to get worse before they get better

Article

2021 saw various high-profile outages break the internet, exposing the world's reliance on a handful of cloud and connectivity providers as well as the fragility of an increasingly overburdened infrastructure.

Massive service outages have become a stark and persistent reminder of the hold Big Tech has on infrastructural power.

- An **Amazon Web Services** (AWS) outage in early December affected Amazon delivery and fulfillment, **Echo** speakers, **Ring** doorbells, **Venmo** payments, **Roomba** robot vacuum cleaners, and hundreds of other apps, websites, and services.

- The outage also had a serious impact on **Delta** flights, **Disney** theme parks (guests could not check in online), day traders (**Robinhood** and **Coinbase** were offline), as well as dating app **Tinder**.

- A bad software update in June took out content delivery network Fastly and resulted in a global outage that took out **CNN**, **The New York Times**, **Bloomberg**, and **Reddit**. Service-oriented websites like **Amazon, Twitter, PayPal, Spotify, Twitch**, and the **BBC** were also down.

Shift to remote work and learning will continue to push networks to the brink

The continued global pivot to hybrid and remote work and school has placed unprecedented demands on the internet, particularly on home networks that suddenly have to handle multiple streaming video feeds for **Zoom** calls, compounded by more users and their devices constantly online.

Internet services catering to residential users are designed to deal with peaks of activity at specific times of the day, like evenings when families return from work and school. They aren't built for high bandwidth use around the clock.

- The rise in streaming services, online gaming, and the addition of billions of IoT devices creates an overwhelming strain on the network.

- "We just don't know how the infrastructure will fare," Tom Wheeler, a former chairman of the FCC, told The New York Times. "What is sufficient bandwidth for a couple of home computers for a husband and wife may not be sufficient when you add students who are going to class all day long operating from home."

With the return-to-work time frame pushed back by pandemic surges and the surfacing of new variants, **it is quite likely that the remote work reality will continue throughout 2022.**

However, it's unlikely that network and cloud providers can scale rapidly enough, especially given the various component and fiber shortages.

Accountability remains in question

While service downtime comes with the territory of being a network, service, or cloud provider, the highly interconnected nature of today's networks could lead to devastating effects.

In November, **T-Mobile agreed to pay a $20 million FCC fine after a 12-hour outage** in June 2020 resulted in the failure of tens of thousands of emergency 911 calls. T-Mobile was also ordered to implement compliance plans to avoid future 911 outages.

Should regulators enforce stricter fines and penalties when outages take out basic services? Possibly, but this could also be the reason many outages remain unreported. More worrying is the reality that **the government relies on Big Tech companies like AWS and Microsoft Azure for defense contracts**. The Pentagon has shifted from awarding contracts to single companies to a multi-vendor, multi-cloud contracts, which should spread out access and bandwidth in the event that one provider suffers an outage.

Scholars and **regulators have begun to call for reform and reimagining of antitrust laws** to not only address how Big Tech firms dominate share within markets, but also how their concentrated infrastructural influence introduces new types of anticompetitive harms.

This is unfolding just as Big Tech is expanding to own internet infrastructure as well as last-mile 5G networks, indicating even more consolidation of services under monolithic tech companies.

The aging internet infrastructure is its own problem

The pandemic accelerated the remote work reality and exposed the weakness of overloading internet networks and infrastructure.

- The existing national long-haul fiber infrastructure was **built to support systems, broadband demands, and networks that existed 20 to 30 years ago**.

- Simply adding servers and towers to handle more traffic and users seems to be causing even more complex problems to the infrastructure. **Recent outages have also been taking longer to resolve**, indicating that massive growth is quickly becoming unmanageable.

"This increased demand is testing the limits of global networks and the teams supporting them. Traffic surges are more frequent, longer-lasting, and less predictable. And our greater reliance on software means more frequent deployments of both application code and infrastructure, which increases risk for errors, misconfigurations, and other issues," said **Kris Beevers, co-founder and CEO of [NS1]**, which helps companies manage and deliver software applications.

"I don't anticipate that these challenges will necessarily get worse," Beevers said. "Fortunately, resilience has become a board-level discussion, so we can expect to see a lot of investment in technology that enables automation in networking as well as more distributed, highly resilient edge infrastructure."

The wrap-up

Help is on the way: the US government's [$1 billion infrastructure plan] has provisions for improving internet networks.

- **The downside:** Most of the bill's efforts are focused on providing access to underserved and rural communities, potentially adding even more strain on overall infrastructure.

- **Improvements for the future:** Big Tech's investment in "smart cities" could create the template for more robust networks designed for businesses and consumers. However, early smart city projects in [Columbus] and [Toronto] have been unsuccessful.

The global network infrastructure will continue to be under duress by the shift to remote work and education, as well as the exponential increase in devices and sensors connected to the internet.

Delays in infrastructure expansion due to shortages, as well as the slow uptake of 5G networks, continue to be sticking points. More frequent and complex outages will affect all aspects of life until a more resilient infrastructure is built to support our growing thirst for bandwidth.