Dial-Up Internet: From Gateway to Bottleneck

Going online has never been easier than it is today. Most devices we carry around are always connected, refreshing in the background to deliver push-notifications directly to your pocket. This level of being always connected is what most now see as the standard, but if we rewind just 25 years, the standard would be occupying the phone line connecting through dial-up, waiting for a handshake sequence while listening to the iconic sounds being played while connecting.
This is the history of Dial-Up, its beginnings, developments and obsolescence, providing a look into how the internet as we know it today was shaped by telling your mom to get off the phone.

Dial-up dates back to the late 1950s, when AT&T Bell Labs developed the first commercially available modem to allow for transmission of data through telephone lines. The modem, known as the Bell 101 Data Set, could transmit data at 110 bits per second (bps), and was the first piece of commercial equipment to use the ASCII character encoding standard. (American Telephone and Telegraph Company 1963)

The initial implementation of Dial-Up was limited to direct point-to-point communication, enabling remote terminal access, but it could not connect multiple computers in a network environment. This was not possible until the introduction of ARPANET in 1969 which introduced packet-switched network between computers across institutions. (Barry M. Leiner 1997)

During its initial years, ARPANET did not rely on Dial-Up connections – it instead used high-speed telephone lines - but as these technologies evolved and networks started getting more used both in commercial and private settings the two technologies would merge as ARPANET was phased out and protocols like TCP/IP took its place during the 1970s / 1980s. This also led to Dial-Up modems becoming the method that everyday users would access the internet from their homes. Dial-Up was now the gateway that allowed public access to this world that previously had been developed for research and military use.

Throughout the 1980s and early 1990s as computers became more mainstream, dial-up internet quickly became the primary way for households to get online. These connections did not require the large, dedicated infrastructure that institutional networks required. Instead, users connected through their existing phone lines. This made it the most accessible and cost effective option for the general public to connect, requiring just a computer, a modem and a phone line to go online, only having to wait through the familiar sequence of beeps, static and digital handshake tones

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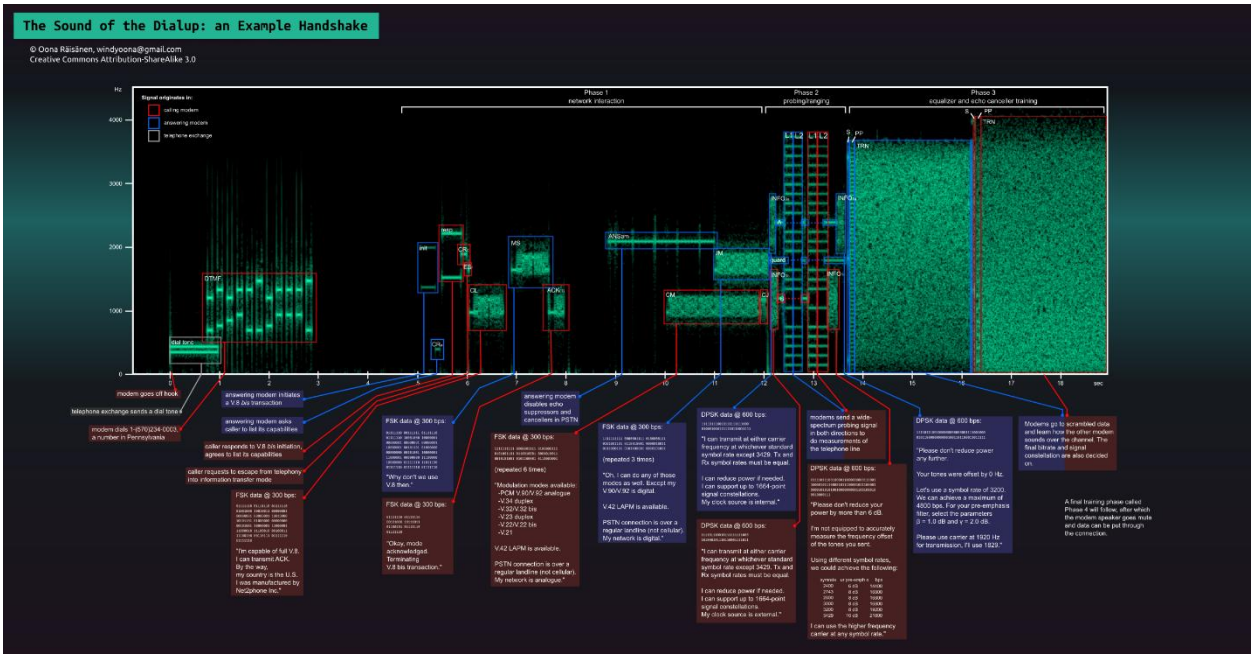

An example showing a Dial-Up handshake between two modems (Räisänen 2012)

The growth of Dial-Up also started the rise of commercial Internet Service Providers (ISPs) like CompuServe, MSN Dial-up, Sprint and most famously, America Online (AOL). These providers offered all-in-one packages that included access to not only the World Wide Web, but also email, chatrooms, games, news and more. AOL played a particularly large role in dial-up's success, distributing millions of free trial CDs and becoming synonymous with going online in the 1990s. (Edwards 2015)

Dial-Up drastically changed how people communicated and consumed media at the time. Services like AOL Instant Messenger (AIM) and MSN Messenger quickly gained popularity, especially among younger users, and the world wide web started blooming with personal websites, forums and blogs. Dial-up was quite limited in speed at this time, being usually capped at 56kbps, but this speed was sufficient for loading text and images as well as basic web browsing.

Despite its technical limitations, dial-up was a gateway for many into a rapidly expanding digital world, having introduced millions of users to the internet for the very first time. However, as the usage of the world wide web and internet in general grew during the late 1990s, demand for richer content also started growing. Being capped at 56kbps started proving to be a bottleneck as serving richer images could take minutes, and serving videos or audio was practically impossible.

The growing frustration caused by the bottlenecks of Dial-Up created a demand for faster and always accessible internet access. This was a demand that helped drive the development and adoption of broadband DSL networks and cable internet. Instead of

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using the phone line like dial-up did, cable and DSL used a separate line to connect allowing for much faster data rates starting at approximately 256kbps, gradually increasing into several megabits per second as it was developed. Broadband networks were not just a small technical upgrade, they created a shift in how people used the internet, going from occasional sessions to constantly being connected and able to go online. This transition helped lay the foundation for the modern web, including streaming, online gaming and cloud-based services – all of which would have been impossible at the speeds dial-up was able to provide.

In the early 2000s, broadband access became more affordable and the use of dial-up started a steady decline. Users no longer needed to occupy their phone lines just to check their emails or browse the web. Broadband helped reshape the expectations people had to the internet. What had once been acceptable speeds with dial—up now felt painfully slow in comparison. In just a few years, broadband became the new mainstream, and around 2010, only about 5% of the U.S. households were using dial-up. (Smith 2010)

Dial-up served as the first experience of the internet for millions of users and laid the groundwork for the digital culture that has grown online since. Dial-up has helped shape the way we communicate online, all from the early instant messaging services and bulletin boards, to email, the growth of personal websites and forums. Leaving behind a large legacy, the audible beeps and boops from the modem handshake remain an everlasting symbol of how dial-up shaped the beginning of the connected age.

Although now mostly known for its odd connection tones, dial-up served as the first bridge between people and the ever-growing world of online communication. Though it was replaced by the faster connections broadband had to offer, it introduced the idea of connecting and going online from the comfort of your own home - logging in to check messages from friends or read the news. The early developments of dial-up and ARPANET laid the ground foundation for the internet as we know it today, from streaming movies and playing games online to being always connected through our mobile devices and social media.

The legendary tones of connecting to the internet through dial-up will forever remain as a part of its legacy, signifying how the beginning of the internet for most users wasn't a tap or a swipe, but required yelling across the house *"Mom, get off the phone!"*.

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