Subject: Re: In The Bedroom
Posted by Wayne Parham on Mon, 23 Mar 2020 15:49:57 GMT
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The central offices are still there, but the older analog equipment has been replaced with newer digital switches. There are still some analog switches but they are mostly just in smaller local phone companies. Even there, most have been swapped for digital switches. We can't support high-speed digital services without IP switches and networks, so stuff like video streaming really needs it.

Right now, the larger telephone companies are still using their own networks as much as they can for their own customers. They provide access to smaller service providers at wholesale cost - That is what the MCI/Worldcom company did in its entirety, providing wholesale telephony services to other companies. All the larger telephone companies do this, but most have a "retail" offering too.

The reason I bring this up is the telephone companies that can route traffic across their own networks can do it without packets from all over the world interfering with their own customers' traffic. This gives a greater chance that the packets will arrive on time and in order. Many even use a hybrid IP approach that provides qualty-of-service prioritization to some packets, so that real-time signal packets can be given priority to regular data packets. The idea is that packets that aren't part of a real-time data stream can be delayed a few milliseconds and still get reassembled at the target end without penalty, whereas real-time packets that are delayed too long are unusable. So these kinds of networks are better suited to real-time data transfer like audio and video.

But there is a lot of intermingling these days. Especially with the rise of VoIP companies like Ooma. A call can originate on a (plain ol' telephone service) POTS line and terminate on a POTS line. It can originate on VoIP and terminate on POTS (or vice versa). Or it can originate VoIP and terminate VoIP.

The originating end might be connected through a service that routes through a public exchange somewhere. Or it might be connected through an internet connection, in which case it will originate on the internet. In either case, the call may terminate on an internet-connected VoIP, a privately connected VoIP or a POTS line.

This means the call could run completely on one telephone company's network, or it could originate on one and terminate on another, so be on two networks. Or more than likely these days, it could originate or terminate "in the cloud" of network space and connect on the other end on a private network. It could even have both connections on the internet, in which case the network(s) that have serviced the call is a little bit ambiguous. Usually a call is routed over several company's networks by the time it reaches its destination.

This makes it tricky to know who to bill for the call. And for that reason, phone companies have developed CABS (carrier access billing systems) to divvy up the costs and revenues from these virtual streams. All the telephone and other communications service providers have agreements to share the love. It's complicated as hell, but it actually works pretty well.

Let me anticipate a question or perhaps an opinionated rant. I anticipate this because it's exactly the way my mind works, so I would expect others might think just like I do. The question/opinion goes something like this: If I'm not a customer of Verizon (who now owns the former MCI/Worldcom network), AT&T, Sprint or one of the other big phone companies, why should my purely VoIP, total internet end-to-end call be credited to one of those companies in CABS billing? Why do they get to claim a piece of the action?

The reason is they are the ones that provide the internet "backbone." They spent - in AT&T's case - the last 100 years running telephone poles and hanging wires all over the world. They ran lines under the oceans. In the 1980s, The Williams Company - who later became Worldcom and then MCI/Worldcom - ran the fiber optics cables through unused pipelines all around the country. And those companies still service this infrastructure.

If a baby Bell connects their customers to a larger network through their own exchanges, then they would pay for the network access. In the old days, direct access made it easy to determine who made connections, where they were made and for how long. If a call came in through specific trunk lines - connected only to one specific local exchange - then you knew exactly what entity made that connection.

But now days it isn't so simple. A company that sells a service that connects purely through the internet would get the (considerable) resources for free if network traffic wasn't analyzed and carrier access billing employed. And even calls and other telecommunications services provided by "regular" phone companies that have equipment and networks will most likely be routed over other company's equipment and networks at some point between origination and termination endpoints. So all the intermingling of networks and the complexities of routing make CABS really important for all the telecommunications companies.