

A Primer on the PSTN

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What this talk will cover:

The technical aspects of telephony

(Why? Because it is useful for you to know, useful to me for you to know, and it's awesome!)

What this talk will not cover:

The legal or business sides of telephony

(Why? Because not only is it key to competing against my employer, it's also really, really depressing and boring unless you're the right person)

Disclaimer:

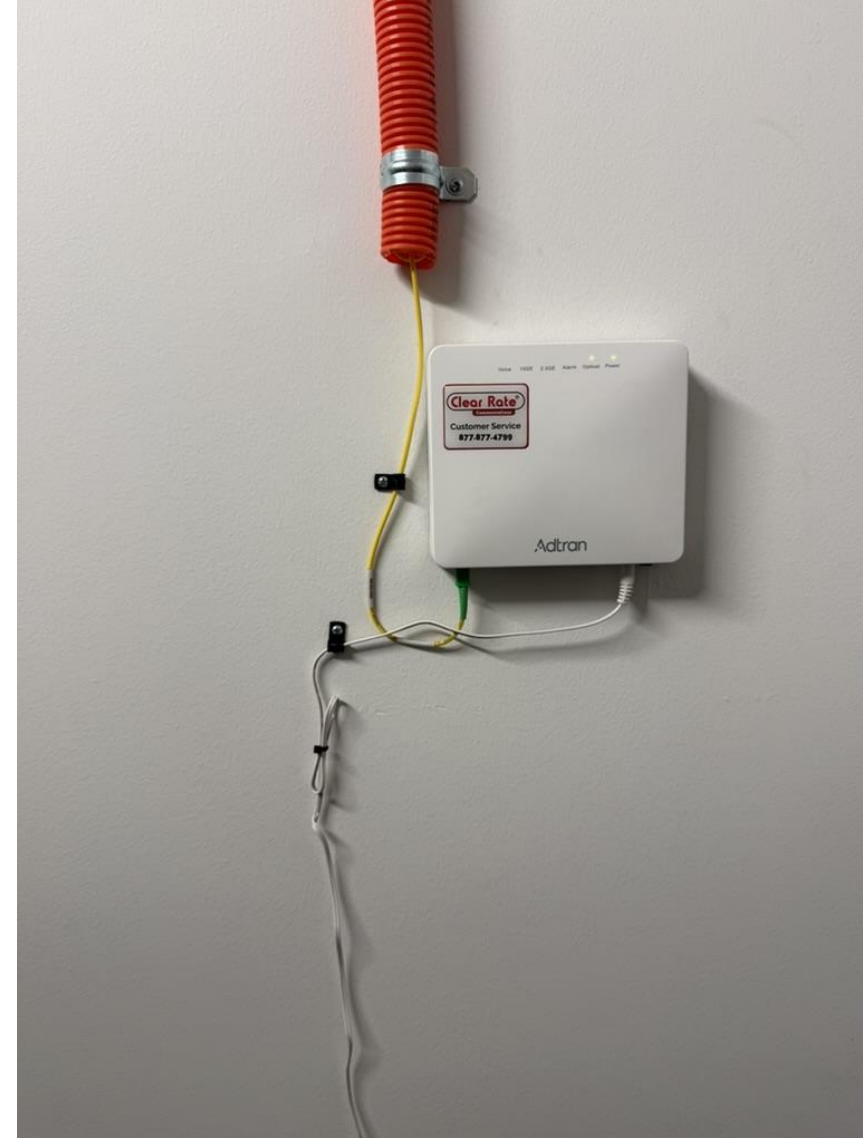
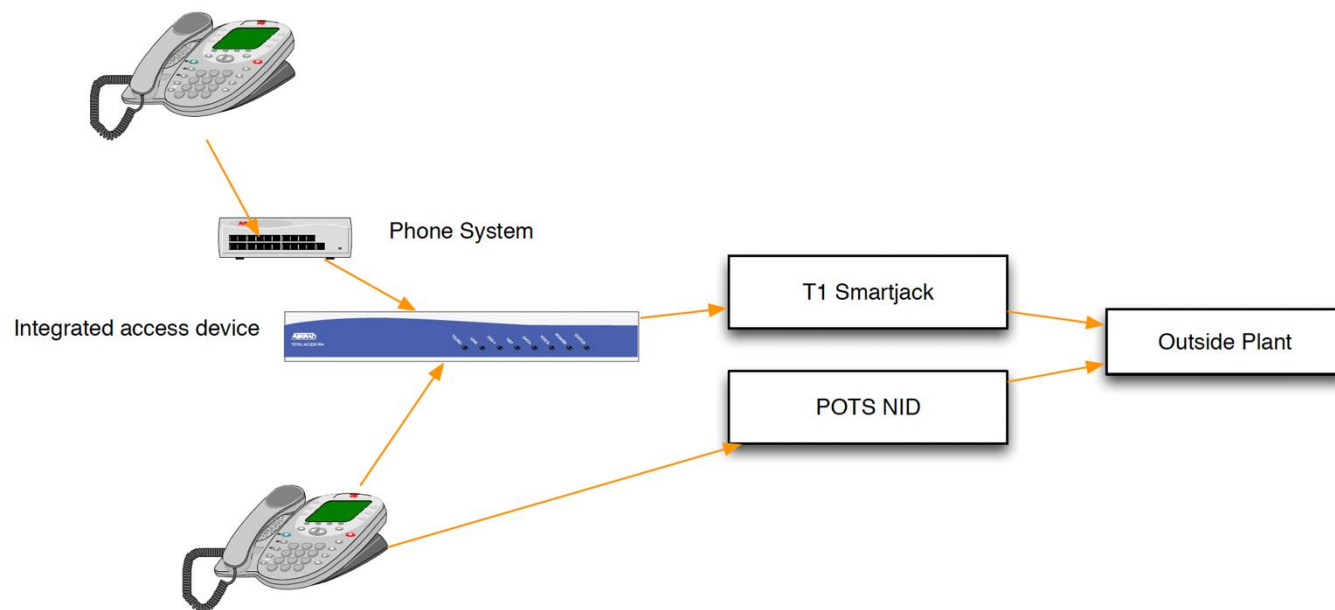
I work for a midwestern telephone company as the senior network engineer. I run the world's largest and most popular free telecommunications database at <http://www.telcodata.us/>

During this talk, I officially speak for neither.

Additionally, I will not answer questions, on or off the record, that in my sole judgement may materially assist you in competing against either company. I am contractually prohibited from helping you compete with my employer. It's nothing personal.

OLD

Customer Side

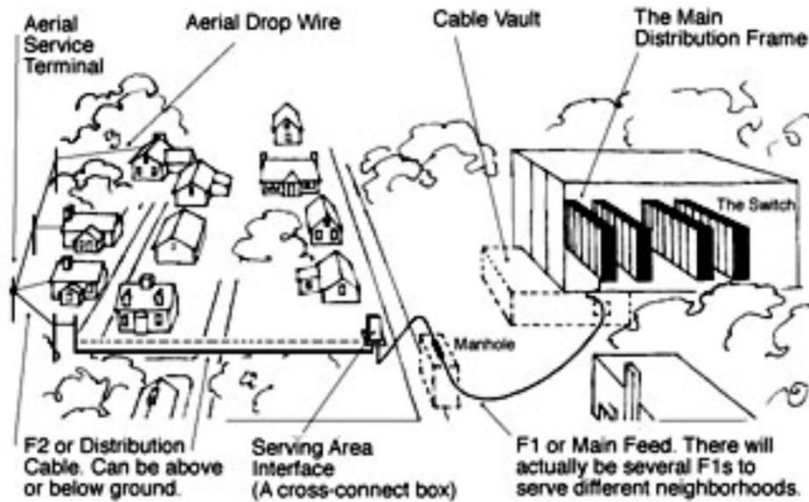


Fiber ONT (XGS-PON)



IP Phone

Old Local Loop - Outside Plant



Credit: <http://www.privateline.com>

Modern:

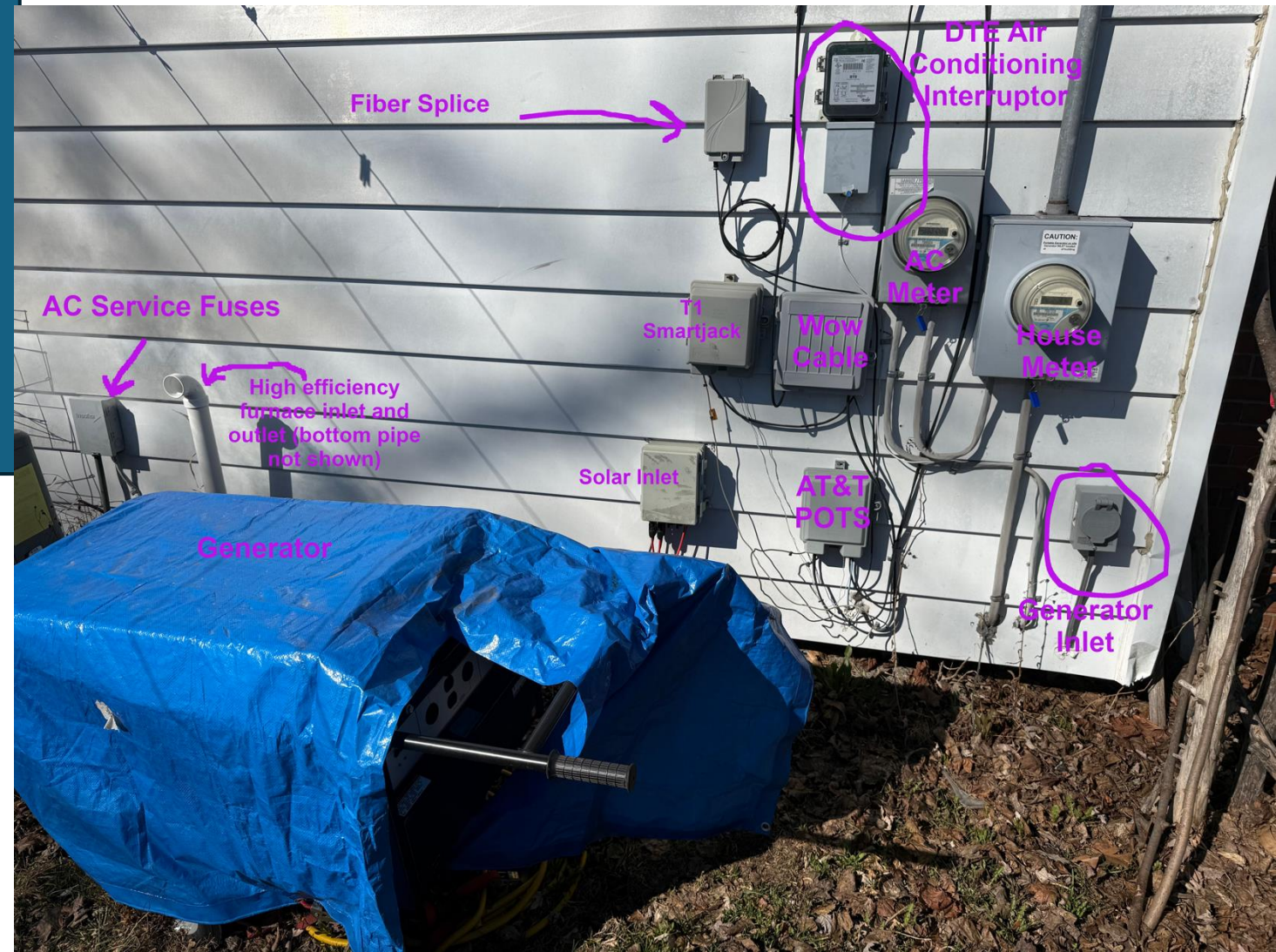
Fiber optic cable, splices, then to a PON splitter, then to an OLT where it's converted to ethernet, and brought to a router. Any voice, including legacy POTS is SIP and brought in mixed with the data traffic or on its own VLAN but still then jumps on to the data network with everything else.

A T1 multiplexer is in the picture, but is not used.



What's on the side of your house?

Old

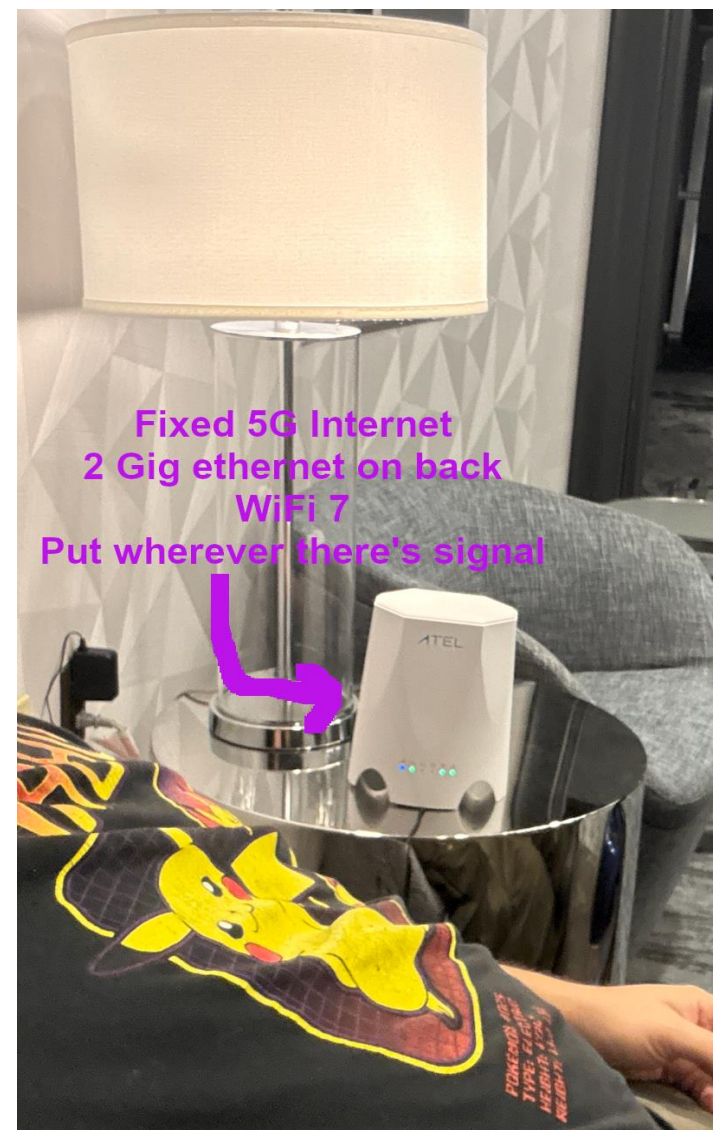


POTS Network Interface Device (a/k/a Demarc)

Used to provide a demarcation point between your wiring and the phone company's wiring



Coax eMTA (Voice and Data)
Voice via SIP or MGCP

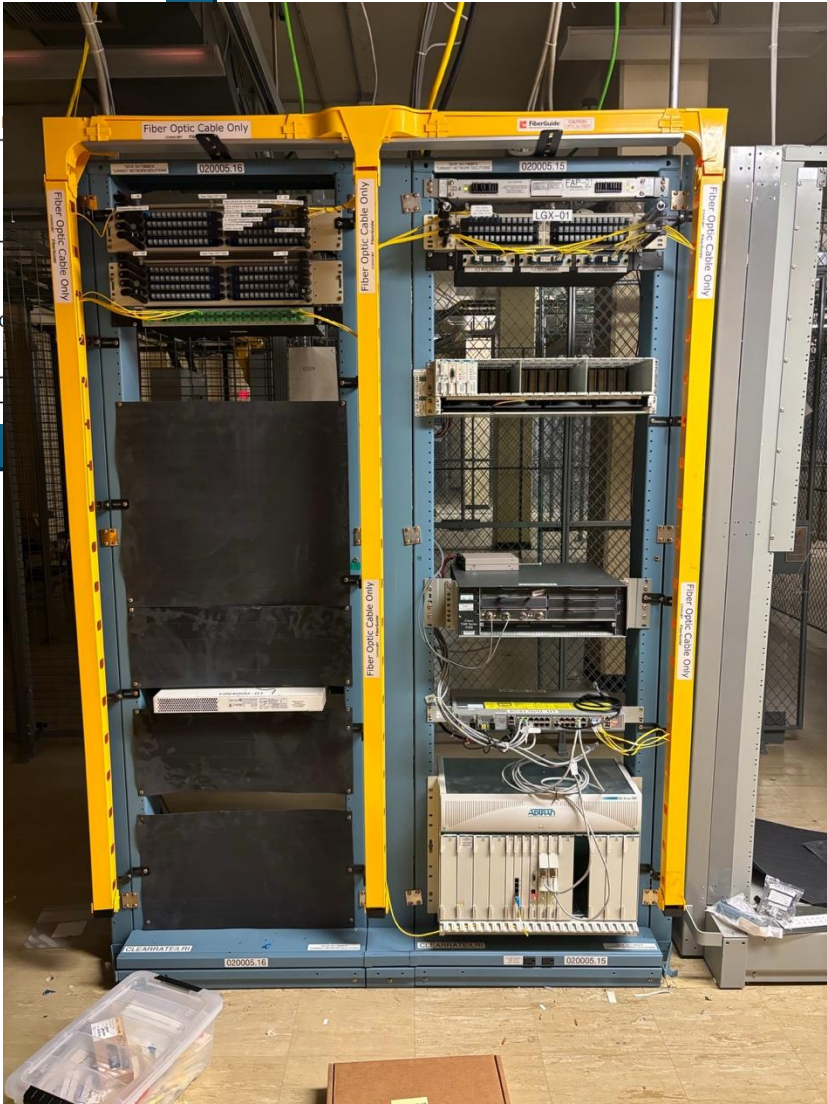
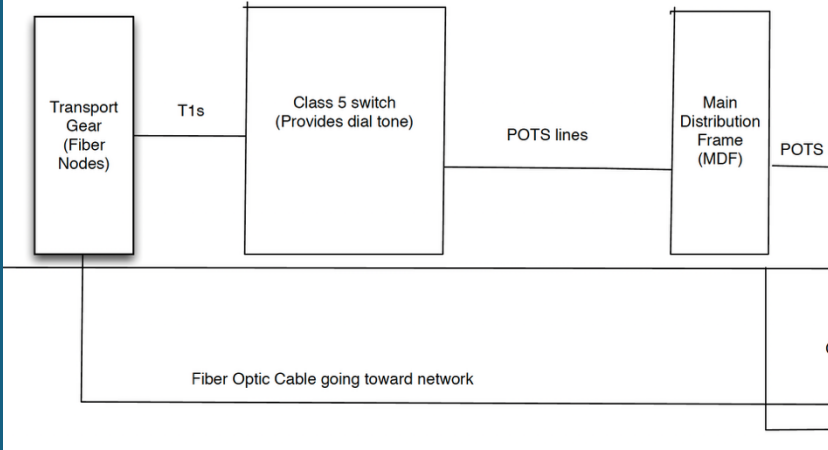


Fixed 5G Internet
2 Gig ethernet on back
WiFi 7
Put wherever there's signal



XGS-PON ONT – Voice is SIP, 10GE and 1GE

The Central Office



Cable Vault

LOG IN or JOIN

The Big Story: Samsung Galaxy S4 review



Photo: The Virge - "Into the vault: the operation to rescue Manhattan's drowned internet"
<http://www.theverge.com/2012/11/17/3655442/restoring-verizon-service-manhattan-hurricane-sandy>

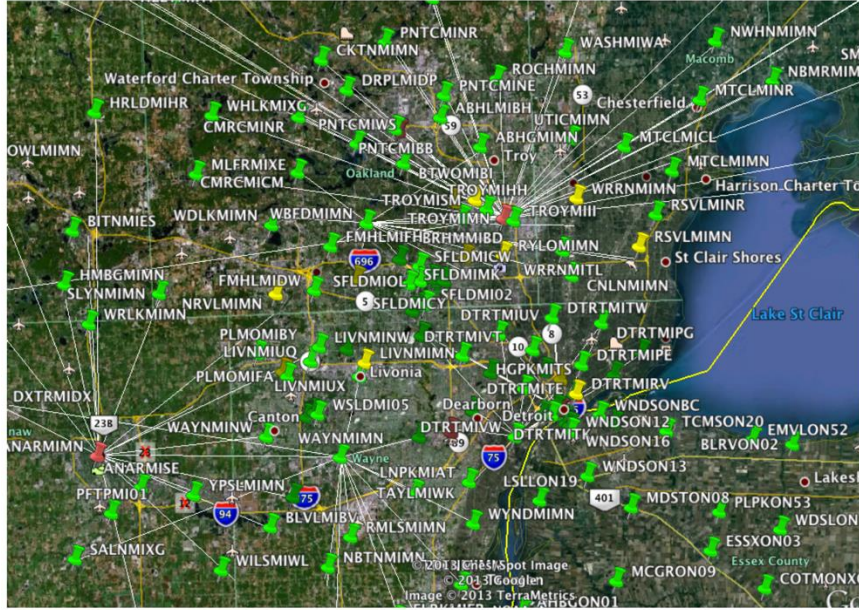


Manholes



Photo: The Virge - "Into the vault: the operation to rescue Manhattan's drowned internet"
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Tandem Network



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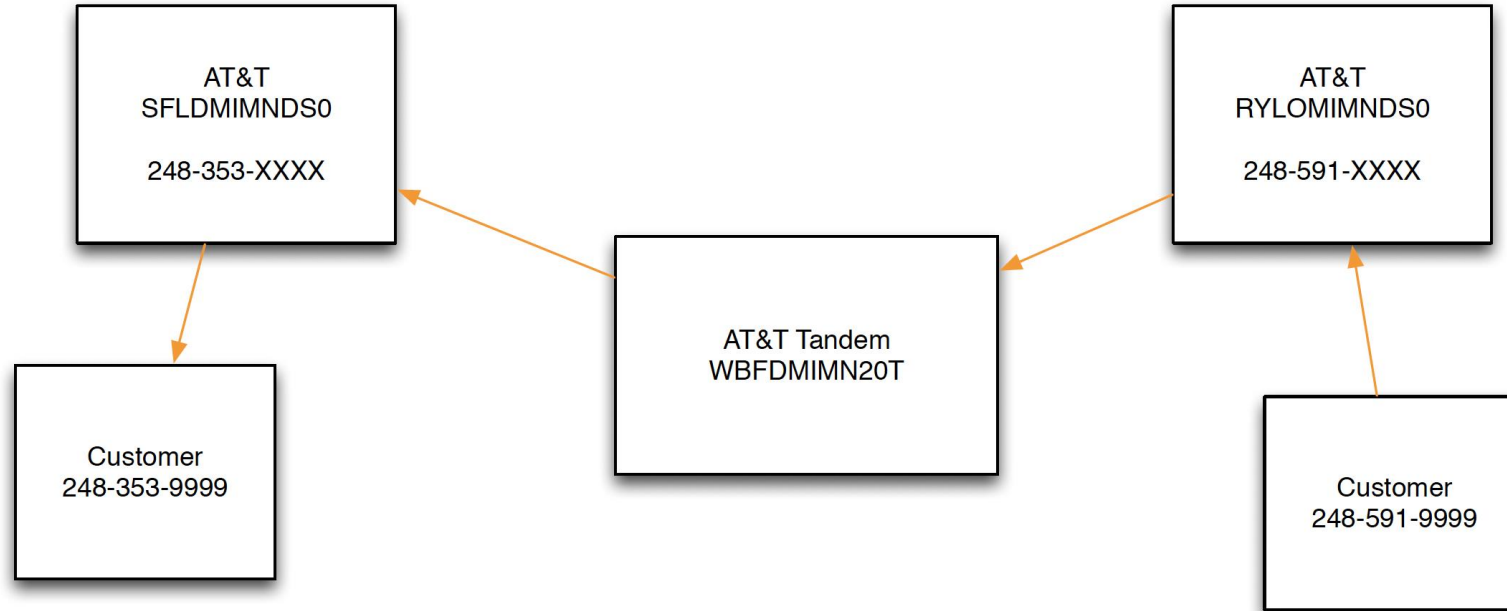
AT&T No longer the dominant carrier for interconnection.

Sinch (f/k/a Neutral Tandem, f/k/a Intelliquent), Bandwidth.com, Infobip (f/k/a Peerless) and many direct interconnections (Verizon Business, Verizon Wireless are directly connecting with IP carriers, for instance).

Many of these interconnections are not as publically visible as they once were – these were previously pretty uncommon when there were costs to purchase T1s and transport them around and open SS7 point codes. Now it's all SIP trunks over the public internet.

Tandems - Simplified

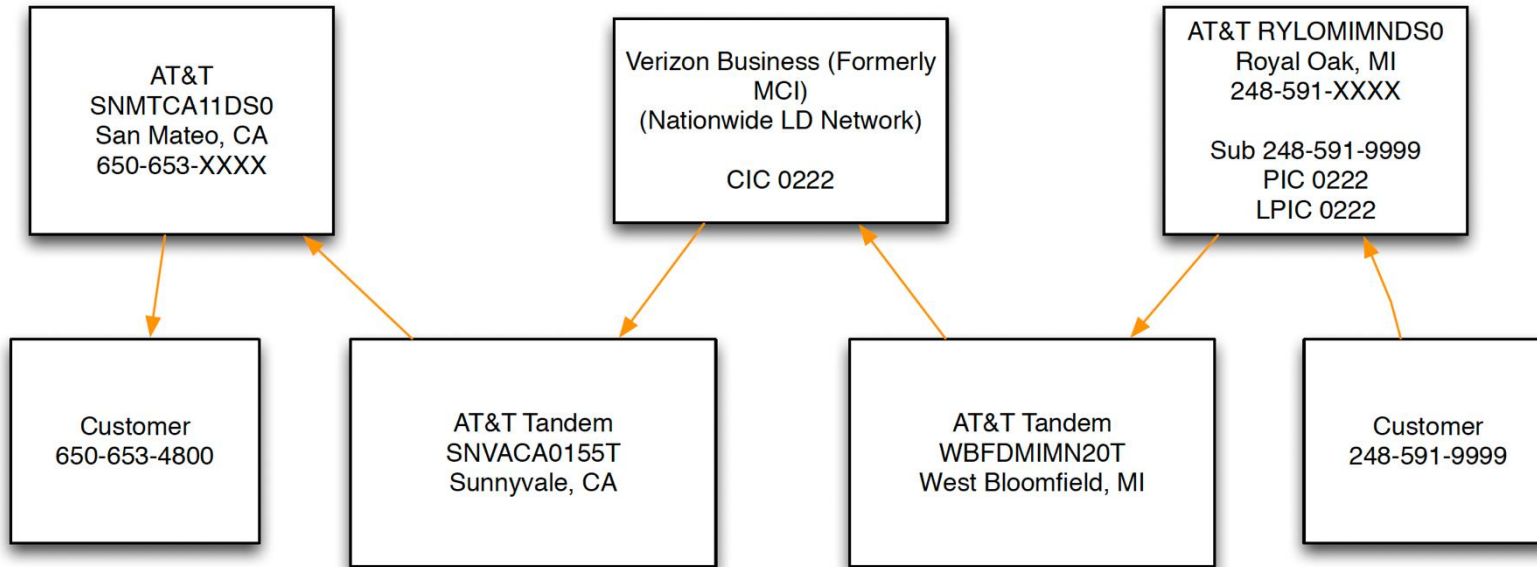
Local Call



The names have changed but the concept remains

Tandems - Simplified

Long Distance Call



Equal access (CIC subscribed long distance) is for all practical purposes, dead.

Every carrier bundles long distance service. It works the same way, with a wholesale long distance circuit in place of the first tandem on the left in the picture (WBFDMMIMN20T). All long distance calling outside the footprint of the originating carrier are bundled onto a single bill to the originating carrier and at a highly negotiated rate. This lets things get pretty close to free.

It's SIP all the way down. Your encoded voice payload from your phone is now relayed nearly untouched from beginning to end. In the future this could allow high quality G.722 or even stereo audio, video, or other payloads across the public telephone network.

It already allows call authentication (STIR/SHAKEN) to be carried from originating carrier to far end carrier. The TDM world still exists but more as the legacy stuff attached to the edges rather than the old days of it being in the core.

