i341 Network & Distributed Applications

DIVESTITURE and DEREGULATION

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Many different companies provide telecommunication and data communication facilities as well as support specific services. Due to deregulation, these companies are going through some of the most significant changes since the beginning of the telephone era.

Before the divestiture of the Bell Operating Companies by AT&T on January 1, 1984, the telecommunications industry was fairly simple. Customers leased their phones from AT&T (affectionately knows as MA Bell) and received one phone bill for equipment and services. Customers never had to think about who provided their phone service or who they should call if there are any problems.

Divestiture separated the suppliers for long distance and local telephone service. Each of the 22 Bell Operating Companies (BOCs) was incorporated into one of several regional holding companies call Regional Bell Operating Companies (RBOCs).

Prior to 1984, AT&T consisted of many different organizations providing the full gamut of services to telephone users in the US. AT&T serviced the local user, connected locations over long distances, supplied equipment, maintained their service offerings and engaged in the research and development of new products and services. On January 1, 1984, AT&T divested itself of all the telephone companies that provided services to the end user as a result of what has become known as the Modified Final Judgment. According to the federal consent decree issued in 1982 by the Justice Dept. (Judge Green), AT&T would only be allowed to handle long distance service, plus pursue the development and manufacturing of technologies merging computers and telecommunications. The Justice Depts. *equal access* ruling required that the long distance calls (inter-LATA) would no longer be passed automatically to the AT&T network, instead they would be passed to whatever long distance carrier the customer chose.

Before 1962 a non-carrier (non AT&T) device could not be connected directly to a telephone line. Then in 1962, one Thomas Carter in Dallas, Texas, brought suit against the public telephone companies (Southwest Bell and AT&T) to allow direct connection of his Carterphone (mobile telephone) to the telephone line, and in turn, to the AT&T network. This suit eventually resulted in a consent agreement signed by AT&T allowing a non-carrier device to be connected directly to the telephone circuit. Today, interconnection means the attaching of any device to the telephone company line, including devices provided by the carriers themselves such as modems, PBXs, handsets, meter-reading equipment and alarm equipment.

Around the same time, Microwave Communications Inc. (MCI) filed for common carrier status to supply specialized microwave communications services for trucking companies between the St. Louis and Chicago areas.

After over six years in court, MCI was allowed to compete for some of the specialized communications services in parallel with the existing common carriers (AT&T, Western Union). In 1969, MCI was also granted a construction permit for building a segment of its network between Chicago and ST. Louis. The first application was to provide a 2000 Hz bandwidth service (at the time different from any existing carrier services, thus MCI became the first specialized common carrier.

Impact of Divestiture

No longer one call does all

More difficult to analyze/troubleshoot problems (finger pointing)

More competition by carriers for your $$$

More functionality and improvements to network and supporting devices (PBXs, Modems)

Types of Carriers

Local Carrier (Local Phone Co):

Local telephone companies are usually called the local exchange carriers (LECs). The LEC interfaces the end user (home or business) to carrier. This connection has often been described as **the local loop** or, **the last mile**, because it provides the physical connectivity from your voice or data device to the phone network. The LEC is presently the only organization authorized to install wire under the streets or overhead within a limited geographic area. This is significant in terms of cellular radio service. Any service within a LATA (local access and transport area) is considered local.

Long Distance Carriers (Interexchange Carriers - IXCs):

These organizations provide all connections between local areas (LATAs), providing both dial and leased line services. Long distance carriers include AT&T, MCI, Sprint and ITT.

Competitive local exchange carrier

A **competitive local exchange carrier** (**CLEC**), in the United States, is a telecommunications provider company (sometimes called a "carrier") competing with other, already established carriers (generally the incumbent local exchange carrier (ILEC)).

Local exchange carriers (LECs) are divided into incumbent (ILECs) and competitive (CLECs). The ILECs are usually the original, monopoly LEC in a given area, and receive different regulatory treatment from the newer CLECs. A data local exchange carrier (DLEC) is a CLEC specializing in DSL services by leasing lines from the ILEC and reselling them to Internet service providers (ISPs).[1]

CLECs evolved from the competitive access providers (CAPs) which began to offer private line and special access services in competition with the ILECs beginning in 1985. The CAPs (such as Teleport Communications Group (TCG) and Metropolitan Fiber Systems (MFS)) deployed fiber optic systems in the central business districts of the largest US cities (New York, Chicago, Boston, etc.). A number of state public utilities commissions, particularly New York, Illinois, and Massachusetts, encouraged this competition. By the early 1990s, the CAPs began to install switches in their fiber systems. Initially, they offered a "shared PBX" service with these switches and interconnected with the ILECs as end-users rather than as co-carriers. However, the New York Public Service Commission authorized the nation's first CLEC when it required the New York Telephone (the ILEC) to allow Teleport Communications Group's switches in New York City to connect as peers. Other states followed New York's lead so that by the mid-1990s most of the large states had authorized local exchange competition.

The Telecommunications Act of 1996 incorporated the successful results of the state-by-state authorization process by creating a uniform national law to allow local exchange competition. This had the unintended consequence of stimulating the formation of many more CLECs than the markets could bear. The formation of these CLECs, with easy financing from equipment vendors and IPOs, was a significant contributor to the "telecom bubble" of the late 1990s which then turned into the "bust" of 2001-2002.

The original CAP/CLECs spent the decade from 1985-1995 deploying their own fiber optics networks and digital switches so that their only reliance on the ILEC was leasing some DS-1 loops to locations not served by the CLEC's own fiber and interconnecting the CLEC's switches with the ILECs' on a peer-to-peer basis. While not trivial dependencies, the original "facilities-based" CLECs such as TCG and MFS were beginning to become profitable by the time the Telecom Act was adopted. In contrast, many CLECs formed in the post-Telecom Act "bubble" operated using the unbundled Network Element Platform (UNE-P), in which they resold the ILECs' service by leasing the underlying copper and port space on the ILEC's local switch. This greater dependency on the ILECs made these "UNE-P CLECs" extremely vulnerable to changes in the UNE-P rules.

In the meantime, the largest facilities-based CLECs, MFS and TCG, had IPOs and then were acquired by Worldcom and AT&T, respectively, in 1996 and 1998 as those long distance companies prepared to defend their business customers from the Regional Bell Operating Companies' (RBOC) incipient entry into the long distance business.

With the Triennial Review in August 2003, the FCC began to rewrite a large portion of the rules implemented by the Telecommunications Act of 1996. One alternative to the UNE-P is unbundled network element loop (UNE-L), in which the CLEC has access to or operates their own local switch. The underlying copper (loop) that runs to your house is then leased by the CLEC, and cross-connected to the CLEC's switch. Both UNE-P and UNE-L have their own unique advantages and disadvantages. Other CLECs bypass the ILEC's network entirely, using their own facilities. These facility-based LECs include cable companies offering phone service over coaxial cable.

In October 2004, the U.S. Supreme Court allowed a lower court's ruling to stand (by refusing to hear the appeal) that voided rules requiring ILECs to lease certain network elements (such as local switching or the high-frequency portion of the loop) at a cost-based regulated wholesale price to CLECs.[2] The FCC agreed earlier in the year to rewrite rather than appeal the validity of the rules. In December, 2004, the FCC released another set of rules which phase out, over a year, all CLEC leasing of ILEC local switching, while preserving access to most copper local loops and some interoffice facilities.

Services:

Tariffs - are the documents submitted to the regulatory agency for permission to offer a service. The tariff specifies the service to be offered, the rates charged and requirements imposed on both the user and the carrier. All tariffs that involve interstate are ruled on by the FCC, tariffs for intrastate are ruled on by individual PUCs (public Utility Commissions).

The growth of non-AT&T companies will continue to grow for many years although there will be some companies who may encounter problems due to the enormous amount of capital required to get into the business.

Current Telecommunications Regulatory Issues:

1. CATV competing with Local Exchange on services to residence.
   CATV 1 to 30 Mbit services - 200 mile coverage
   LEC (ISDN) 128 Kb - using full duplex, extensive coverage

2. Wireless - AT&T/McCaw deal, local access again for AT&T

3. Additional RBOC and Carrier Services

CenturyLink - Transparent LAN Service
Electric Lightwave - SONET Rings around 7 West Coast Cities
Commercial Internet Services:
Carriers becoming resellers of Data Comm Equipment (Routers..)
MCI/AT&T/Sprint

4. Private Internet Service Providers
Sita/Aeronet - airline customers and airports
MSN (Microsoft Network)

5. Deregulation of Mexico Telecommunications & other International
Business Opportunities
More reliable service
Better cost

Telecommunications Act of 1996

The new telecommunications Act covered six specific areas:

1. The new act opens carriers, the regional operating companies (RBOCS), to competition. If the customer elects to go with the competition, they may elect to retain the same telephone number.

2. The new law allows the RBOCS to enter the long distance business.

3. The telephone companies can offer video over their own facilities.

4. Cable rate regulation will be lifted over time.

5. Telephone and cable companies will be able to merge.

6. The new law addresses installation of the V-chip in new television sets. The V-chip allows TV owners to screen programs for sex and violence.

Local telephone service means the wire, the switch, the dial tone, and the telephone number. Under the new law, local providers must offer re-sale of local telephone service at a fair and reasonable rate. What is fair and reasonable will be determined by state regulatory bodies. Resellers tend to squeeze margins and lower prices.

The RBOCS have a strong desire to get into the long distance business.
However, under the new telecommunications act they are prevented from doing so until there is facilities based competition. "Facilities based competition" is not defined in the new law. Each state utilities commission will define "facilities based competition" under guidelines to be developed by the FCC. The RBOCS will encourage competition so they can get into long distance.

Installing switches and telephone line is very expensive. Re-sale is cheap.
Experts have pointed out that while it appears that no one is considering re-wiring America, in dense business areas, business parks and downtown areas, there is justification for well financed companies to install new facilities. There are no economic drivers for installing new facilities in residential areas. It seems likely that competition will thus thrive in the dense service areas. The end result may be that these areas could have multiple, in some cases several facilities competitors. In the suburbs, there will probably only be resellers.

The cable companies have a strong presence in the residential areas. They might offer telephone service in competition with the incumbent telephone companies.
Cable companies are driving to offer plain old telephone service (POTS) in addition to offering low cost, wide bandwidth (higher speed) internet access. The cable companies would compete with ISDN access offerings by the telephone companies. Cable companies could be in a position to supply internet access including the cable modem at reasonable rates (Some experts believe as low as $30 per month).
Cable companies have compelling reasons to upgrade their networks to provide two way communication. This is a potential huge source of revenue with a quick pay back. If high speed reliable access at reasonable/competitive prices is available the cable modem should prevail over ISDN for home internet access. This may be one of the key elements in promoting telecommuting as a viable option for companies.

The cable companies are capable of providing some highly sophisticated services. One potential problem will be providing adequate customer support. Cable companies will provide a consumer-oriented level of service, not mission-critical. This is why many cable companies have merged with RBOCs, since generally telephone companies (local and regional) are accustomed to providing the high levels of customer service/support.

Divestiture – Main Points

* No longer one call does it all

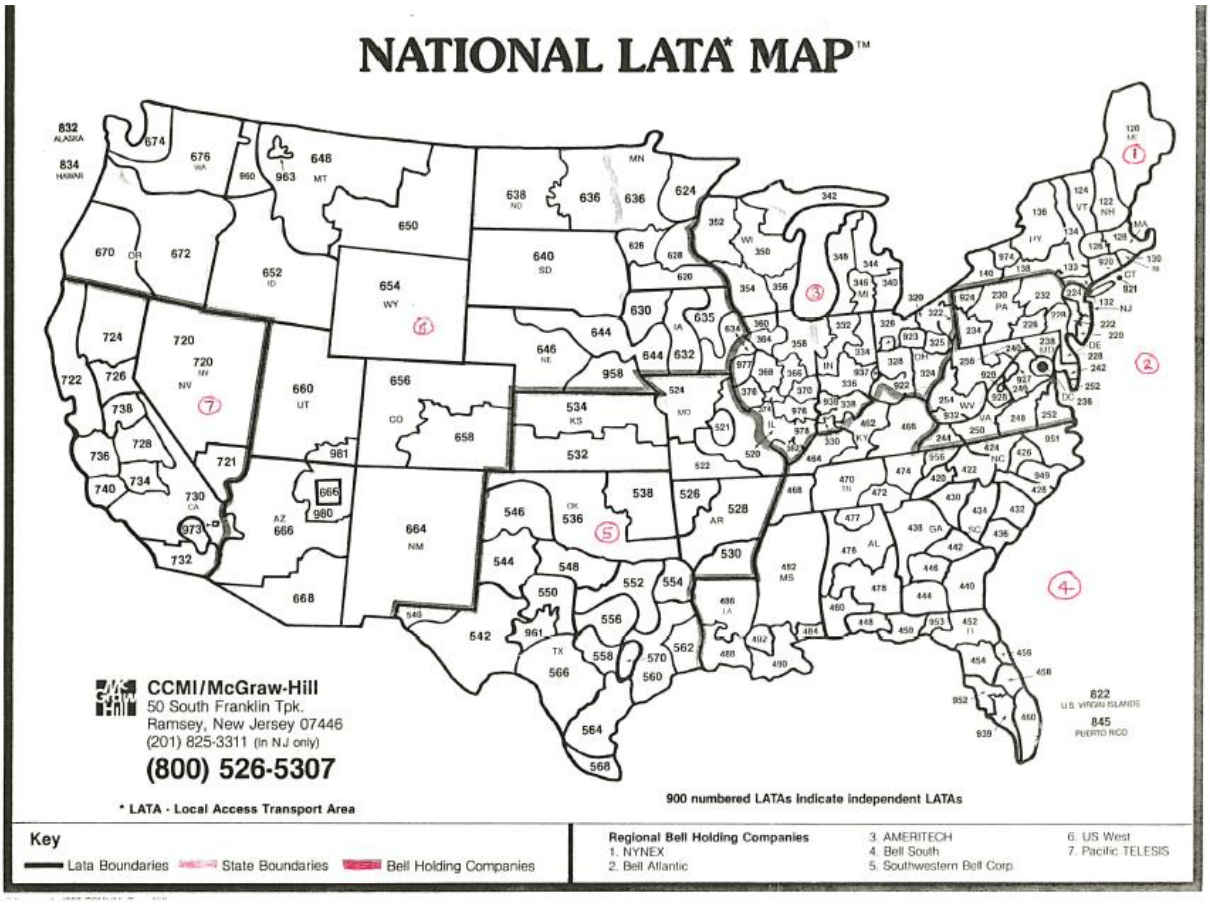
* Freedom of Choice (IXC/Long Distance & Local – Telcomm Act 1996)

* Requires increased customer knowledge of carrier infrastructure & components

* More difficult to analyze/troubleshoot problems (finger pointing)

* More competition by carriers for your $$$

* Develop understanding how to bypass the LEC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