# Netwatcher

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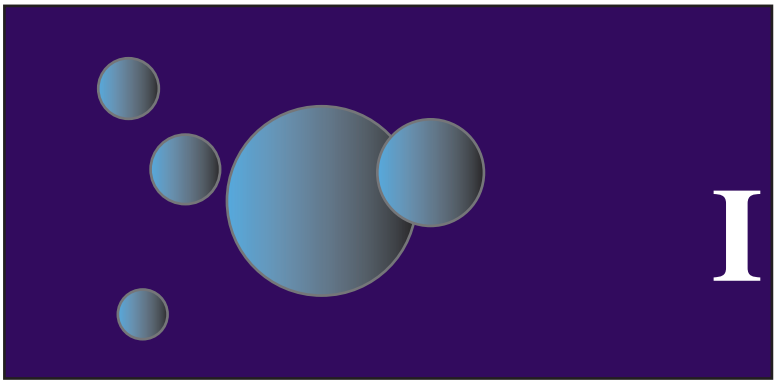
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**August, 2001 Volume 19.8**

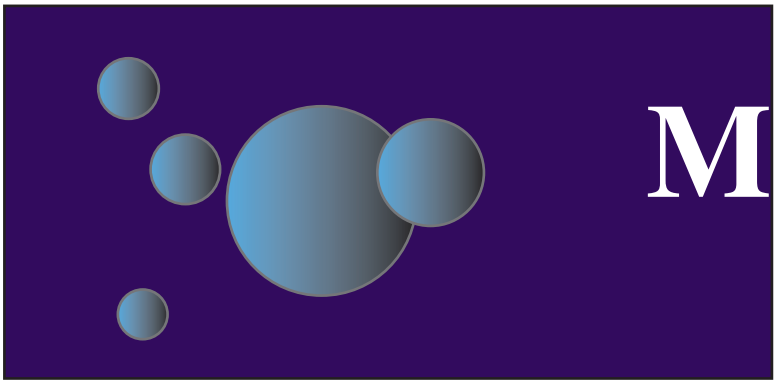
**Market Area Focus** looks at one of the truly hot and important market sectors of our age, the service switch market. Is there more to a service switch than IP? We'll tell you that, and more! Sorry, Internet readers, but this is for subscribers only!

**Management Briefing** offers the latest in market conditions, including a possible Congressional compromise on Telecom legislation.

**In the Know** asks just what fundamental business and technology conditions would do to change our market, even without regulatory changes. Hang on to your hats, the future could be wild.

**Strategies** examines the coverage of our industry recently offered in Business Week, and rates the magazine's response and remedies. This section is also reserved for subscribers.

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# Management Briefing

The Congress went into recess for August, leaving (as expected) the issue of regulatory reform for the fall/winter session. AT&T continued to coyly court offers for its broadband assets, but Wall Street seems to be concerned that the bidding war won't go as high as needed to justify the speculative pop in the price of AT&T's stock. Earnings reports continue to dog telecommunications, and an Intel executive stated the obvious—that technology overall would recover before networking/telecommunications. In all, a month that brought more of the status quo.

The regulatory situation, the most important issue in our marketplace, is really not as dismal as it had been. As we noted last month, there seems to be a mood to broker a deal between House and Senate, where each passes its own reform bill and a conference committee resolves the differences. That would dodge the intractability of Senator Hollings, now the major obstacle to achieving some meaningful change in the regulatory space.

Assuming that our view is correct, the next logical step would be for the Senate to open hearings on the Brownback bill (S 1126). A key to achieving a reasonable compromise on regulatory reform is to get the Senate version out before politicization of the issues makes compromise difficult. Thus, the Senate bill should move before the House considers the Tauzin bill (HR 1542).

A recent sign this may be happening is the introduction of a new bill by Senator Hollings himself. S 1364 is made up primarily of restatements of many of the regulatory points included in other "anti-RBOC" bills, including anti-trust linkage, but it contains a new section aimed at requiring the RBOCs form a wholesale/retail subsidiary combination, a measure that we've said in the past would only create more cost and possibly risk the business case for broadband. We think it will result in higher prices for every tier of access and local service, and is thus seriously anti-consumer. The question is whether it's a necessary price to pay for broadband access reform.

The good news is that the extreme separation requirements of the bill would come into play only if the RBOCs were found to have failed to live up to their regulatory duties with respect to competitors. That linkage might even create a positive effect by pressuring the RBOCs to play nice and move things along or suffer serious consequences. It's possible that the fall might bring hearings in the Senate to combine the Hollings and Brownback bills into something that would actually be semi-workable. It would then have to be reconciled (presumably in a conference committee) with the Tauzin bill as it would likely be passed by the House.

The Senate bill is more "Internet-like" in its approach, limiting its application to the consumer broadband market (though it would still protect dual-mode consumer/business facilities). The House bill is (in its current form) broader in impact, providing a more general high-speed network exemption. We believe that the House bill would bring about a more rapid change in the networking marketplace for that very reason. With the Tauzin formula, it's even possible that recapitalization of the current voice network would be accelerated, though that may be a stretch. How a compromise might impact the market is simply too difficult to call for now. We'll watch developments and continue to report.

On the AT&T broadband deal, it seems to us that the unfolding events are taking the cable industry more in the broadcast entertainment direction than in the two-way broadband network direction. We note that Excite@Home has underperformed in revenue generation, and in fact needs additional capitalization. Given that, it would seem that broadband Internet access isn't something that cable companies can really make a ton of money on. The future may be different, but it's hard to say exactly what economic or other conditions will bring about a new and profitable service set. Thus, cable Internet access may be a play that depends more on a broad belief that "somehow it will get better" than on objective business factors. That would make it a speculative play in a market that seems to be eschewing speculation, as they say.

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The low-profile cable Internet play may also be related to regulatory attitudes, though. The Brownback bill justifies Congressional intervention on the lack of balance in regulation between the ILECs and the cable companies. This is not the best time for the cable companies to rear up, tall and ugly, to confront the market. The Beast of Cable Monopoly would seem more formidable, and there's even a chance the regulatory pendulum would swing against the cable players—who have won the last couple of rounds in Washington.

All of this may be helped by the growing conviction that Wall Street isn't coming back to networking with any confidence unless some fundamental changes in market conditions develop. In fact, without a convincing rehab of networking, there's a question whether a tech rally could be sustained. Cisco, bellwether of the network segment, reported earnings on Tuesday the 7th of August. While the numbers were in line with estimates, the company's comments on the state of the market were considered negative. To this bad karma was added the Fed report that the economic problems in manufacturing seemed to have spread to other sectors. We had bad earnings reports from a bunch of network and non-network players. As a result, the NASDAQ dropped back below 1900.

The optical sector, in particular, seems to be continually disappointing Wall Street. That's no surprise to us; optics is a slave to the creation of a successful model turning lots of bits into lots of bucks. That model has to incorporate access reform on a large scale, or there's simply no way to get those bits onto the network.

In contrast, the computer sector and chip sector seem to be on the verge of a rebound, current weakness notwithstanding. Again, that's no surprise. Fed intervention can stimulate the consumer sector and increase overall economic activity, helping the software and computer hardware players and their semiconductor suppliers. In fact, we think that PC sales this fall will accelerate in the fourth quarter, as soon as it's clear that the price declines have run their course.

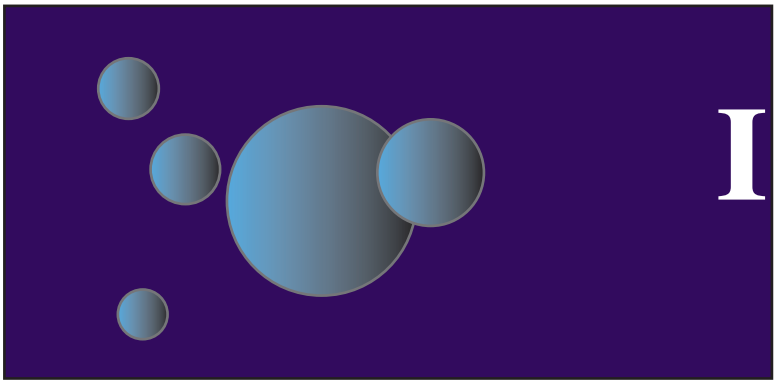
It seems to us that the market forces are sending a clear message—one that we've cited before. **Greenspan isn't going to save us** in networking. The fact is that the Fed cannot bring networking back, and will be able to jump-start the rest of the tech sector only if it's prepared to cut another 75 basis points (0.75% for those not Fed-literate). We think we're going to get at most another half-percent, so there will be a slow and orderly recovery in computers, chips, and software.

As it becomes clear that networking is tanked for structural reasons, the pressure on Congress to do a deal will increase. Unfortunately, lobbying pressure will increase at least as fast. It would be really nice if we could get a regulatory reform that actually met market needs and not one that was designed to kiss all the lobbyist babies in sight. Nice, but unlikely. Thus, we think that it will be important to develop a plan to respond to the way that regulatory reform plays out, acknowledging that many of its impacts will be indirect or even accidental.

Congress will return from summer recess after Labor Day, and there may be either rapid or slow progress in bringing these telecom issues to a debate. At the very least, we think Hollings will hold hearings on the matter, and the announcement of these hearings will be the opening bell on a very interesting and important period in the development of our industry. We'll be watching them, and we strongly suggest that everyone else do the same.

Meanwhile, we're providing some more information on industry conditions this month. *In the Know* will look at how the basic business conditions of the market might change the face of our industry in the future, even without regulatory stimulus. In *Strategies* we'll examine the perspective offered by *Business Week* on the state of the industry, and look at their eight industry points/recommendations in detail.

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# In The Know

Networking, as a marketplace, is probably fairly seen as a balance between basic business and economic factors and public policy factors, with the latter embodied in regulatory policy. Technology isn't really a primary issue, but rather is something that would influence one or both these primary forces. Given this truth, it might be helpful to reflect on the business/economic conditions in the market, and how they could impact networking even in the absence of regulatory change. That might then provide a position from which we could judge the interplay of regulations and economics, when and if regulations are changed.

Businesses succeed because they make money. Most people understand and agree with that statement. The harder issue is just how much money a company has to make, and that is dependent in part on the progress of the business through its life cycle.

In the early stages of most businesses, they must spend more than they earn. During this period they are reliant on outside capital sources, either from investments (private equity like VCs, or public offerings) or debt (bonds, borrowing). A company must repay the debt, and must earn a return on the equity. If they don't do either, they fail in the long term. The company must also make enough profit to cover its operating costs. Thus, it's not enough for a company to simply "break even". It must earn a profit to generate credibility for its stock, and to reclaim its debt. How much? It depends on the expectation level of the market.

## Profits, Margins, and ROI

Companies in their early life are often speculated on rather than invested in. That means that people buy the company's stock because they think the company will eventually prove highly profitable, not because it is at the moment. Expectation of large future earnings growth is reflected in a large multiple of stock price to earnings per share (P/E multiple), and high multiples are typical of growth sectors like (historically, at least) technology. As the company either realizes its potential or shows itself incapable of doing so, the stock prices level off to values more typical of the market overall.

So, we can say that eventually profits count. We can also say that large profits assure high share prices, good access to capital, good debt ratings from bond rating companies, and general financial stability. We can also say that the profit potential of network services determines the business structure of the carrier market, and their spending on equipment. That in turn determines the health of the equipment sector

"Profit" is often accompanied by another word, "margin", to denote the difference between the cost of producing the product/service at the low level, and the retail price to the actual consumer. Lately, the term "margin" has come to be used by itself as a shorthand for the longer "profit margin" term.

In cost terms, margin calculations must consider both operating costs and capital costs. The former costs are applied as incurred—"expensed" is the typical term. The latter are usually amortized over the useful life of the equipment being purchased; this is sometimes called "capitalized" and some times "depreciated".

Because of the capital cost introduction, margin can be related to **return on investment** or ROI. When a particular product/service has a high ROI, it contributes a high ratio of sales to cost and thus increases margins. When the ROI is low, there is a good chance that the product/service would erode overall margins for the business.

A company's average ability to convert investment into revenue is measured by its **internal rate of return**, or IRR. A new project representing a product or service launch that offers an ROI lower than the company IRR degrades margins. While it's not always

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true, it is common to find that "growth" segments of the economy are those that offer a high segment-average IRR. Run through the Fortune 500 list by market sector and read the IRR averages by sector, and you'll see what we mean. In general, a high rate of return or ROI lets a company capitalize on investments made in it by stockholders, and to pay back debts incurred at prevailing rates without compromising profits.

Investing capital at the IRR can be viewed as perpetuating the profit margin status quo. Most companies, attempting to raise their revenues and profits, may assign a **target ROI** to new projects, setting the target value above the company's IRR to reflect the company's goals. This target ROI can also be expressed as a "payback period", the number of months it would take to recover the cost of the investment at the ROI it will earn. Most target ROIs are set at somewhere between 25% and 40%, reflecting payback periods from about 18 months to 48 months.

Where infrastructure costs are high (as in the common carrier sector), it's common to discount the capital spending when measuring year-over-year performance to equalize the cycle. The term "EBITDA" means "Earnings Before Interest, Taxes, Depreciation, and Amortization", and is thus a rough estimate of "operating profit". But being EBITDA-positive isn't the same as being profitable, because it discounts the capital investment and return issues. Neglecting depreciation means neglecting capital investment, and that can put carriers on a dangerous course—one that collides with the interests of the capital markets on which they depend. How can that be avoided? Maintain a high ROI.

It's our view that ROI is the master barometer of service provider success. An opportunity with a large ROI associated with it creates a service target to which a new player can direct its efforts, and if the efforts are successful the rate of return can insure ongoing access to capital for growth. A business opportunity with a low ROI means that investment made there will not earn a conspicuous premium over market rates, and ongoing access to capital is threatened.

A low ROI is OK for an incumbent player with a lot of customers. A high ROI is probably essential for any real competition in a space, because it's what keeps Wall Street willing to bankroll the long process of building out a network to reap the profits.

# ROI and Carrier Business Policy

Maintaining a high ROI in terms of incremental sales and sales policy, means avoiding discounting. That can be done by maintaining feature differentiation, and by maintaining account control. On the cost side, a high ROI can be accomplished by reducing costs overall, or by making a favorable trade of capital cost against operational cost. Favorable cost management strategies almost always include a mechanism to insure that the useful life of a capital asset is extended, since the value of the capital-versus-operations cost trade is enhanced by having the capital expenditure offset operating costs for the longest possible period.

Into this climate, we have had the introduction of a number of market forces:

1. Voice services have ceased to show price/demand elasticity, meaning that future growth of voice service sales cannot be expected to keep margins attractive.

2. Corporate data services in their traditional form seem locked in the top tier of the market, with limited revenue expansion potential.

3. Technology improvements (particularly with respect to fiber optics) have increased the bits-produced-per-dollar quotient of new equipment, lowering barriers to market entry for new competitors. This has exacerbated the voice margin problem by increasing competition in long-distance voice. Technology improvements are less applicable to parts of the network where equipment cost-per-bit isn't the primary cost element. Thus, the local exchange portion (customer access) is less impacted.

4. Account control barriers, which always act to favor incumbent players, and the multi-service discount deals popular with big carriers, act to reduce the sales efficiency of new competitors who have no parallel account relationship. This impact can be dodged only by dodging incumbents, which means either offering new services or offering services to customers who do not currently purchase.

We submit that the following judgments can be made based on the above:

1. The lowering of long-haul bandwidth cost will promote the generation of "wholesale carriers" who have current non-

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Telco operations that facilitate the laying of fiber at a low cost. Pipeline players and other long-haul utilities are examples of this. These carriers will have so low a cost of bandwidth production (owing to new technology and low incremental cost of fiber installation) that they will be able to provide wholesale bandwidth at a lower cost than most other carriers could produce it for. In fact, capitalizing bandwidth production would (for non-wholesale players) be deliberately dragging down ROI.

2. These wholesale carriers may eventually want to rise up the food chain to the retail level to gain larger margins, but two barriers will limit this movement. First, capital cost of equipment to offer retail services is high, and the wholesale player has no special advantage in these higher service layers. Second, account control problems would certainly force the wholesale players to discount sharply, and probably to advertise broadly. The impact on margins would be negative, and an attempt to go retail rather than partner would kill off any partner retail carrier deals.

3. Wholesale carrier advantages in the local access space are minimal because technology improvements have a lower impact on local access cost. The gross margins of access services are too low to permit both a wholesaler and retail partners to earn an effective ROI. Thus, wholesale carriers will not be pervasive in the access space.

4. As both access services from ILECs and wholesale core services from wholesale carriers develop, other players will be encouraged to rely on integrating these components of technology with custom service technology to meet customer needs. Thus, the formation of **service carriers** (SCs) will begin. These players will avoid capitalizing access or transport bandwidth production (as being low-ROI areas), and instead focus on creating higher-layer services that can sustain better margins and support broader market opportunity.

5. Service carriers will find the cost of real estate in areas where access-to-core connections are required will be high, and that justifying the minimum core service relationship with a wholesale carrier may be hard in the early days of service sale. Thus, **Service Hosting Providers** (SHCs) will emerge to provide "hotel" facilities that can be leased by the service carriers. These facilities will include shared high-speed connections to the local access infrastructure and to the wholesale core networks of several providers. Wholesale carriers may themselves offer these facilities to accelerate the penetration of their services and to build margins.

6. IXCs will increasingly become service carriers, leveraging their account control and local POPs as hotels for access-to-core connectivity. They will gradually withdraw from the production of long-haul bandwidth and focus on service infrastructure.

7. To build new market opportunities, all classes of carriers are likely to try both to introduce new services with reasonable margins, and to extend their service markets into untapped areas at a modest cost.

The impacts of these business factors are profound, but we think they're fairly easy to predict.

First, actual transport equipment can be purchased in volume only by companies who have natural assets (like pipelines) that permits them to enjoy the status of "wholesale carrier". This will focus transport fiber deployment on a small number of players, and since not much glass creates a whole bunch of bandwidth, this will lower the total sales for long-haul fiber. We estimate the market might well be less than a quarter of estimates here.

Second, the market will offer only three niches for players, and carrier success will depend on getting into the natural niche quickly to avoid waste of capital and sales resources. For the ILECs, that won't be much of a problem since they're already in that niche. Ditto for the wholesale carriers. The players at risk will be the IXCs and the emerging carriers—ISP and metro. Those guys have to get out of the bandwidth and access business and focus on services and service margins, or die off.

The third deduction we can make is that service equipment is going to collapse into a very thin layer between access and core. Wholesale carriers will deploy service-independent technology to increase their flexibility, and access networks will be largely service-independent as well. This forces all service behavior to the boundary between the two, which may start out somewhat "thick" but will thin out over time until it's a single device deep.

The next deduction we can make is that this network structure will focus attention on a question we've managed to ignore in the convergence hype period; "What creates service behaviors cooperatively in a multi-service network?" One possibility is an architecture like the one proposed by the MultiService Switching Forum (MSF), that creates a kind of multi-lingual enveloping control plane over the network. Another that might operate in conjunction with this MSF strategy, or independent from it, is the

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development of a service management framework that absorbed the service mission from the traditional network management and OSS products. We've been running a series for subscribers on service management since last fall—Syndesis, Trendium, and Mantra have all responded with their approaches. Another player, Cplane, will appear in the September issue. If you're a subscriber, check these out.

Next on our list of deductions is that service providers will increasingly offer integrated services at the technical level to sustain account control and build value. One area where this is certain to appear is in the message management space, where email, paging, voicemail, etc. are likely to be increasingly integrated into a common function. We think this will encourage the development of an **agent architecture** for services. In such an architecture, the customer has an "agent" intelligence residing in the network and connecting to the customer's various information conduits. The agent is then "contacted" by the customer using whatever set of instrumentation is convenient (browser, black phone, cellular/PCS, etc.) and information is delivered according to the rules. Some information could be stored for deferred delivery on request (picking up messages), and other information could be passed though to a suitable client device—a standard call, a page, or an urgent email.

The formulation of the agent architecture will provide the bridge through which wireless applications in the broadband space are created. If a customer's "agent" supports some broadband clients (at home, or at the office), the customer may want to extend the flexibility of that broadband support to remote or mobile use. It's also possible that public kiosks offering broadband capability would be made available eventually, analogous to today's phone booths or pay phones, and a customer could make a secure call to his/her agent from such a location to engage in a service relationship (like a video call) not supported by the personal client device currently in use.

The concept of agency also creates an essential indirection in communications relationships, meaning that the internal resources of the network are accessible only through agents, and these agents are application-specific. This prevents disparities in unit cost of capacity or other resources, existing among a set of public services, to create an opportunity for others to arbitrage one rate against another. For example, video calls could not be carved up into voice bandwidth because the video agent could prevent that adverse use. That protection of resources is essential in creating a safe environment in which providers could migrate users from narrowband-based services to those dependent on broadband resources.

In all, we believe that the business revolution in the service provider space is that the "carriers" will now really become **service** providers and not network or bandwidth providers.

# Who Wins, and When?

The migration to a "service" framework is easiest for somebody who has some measure of customer account control in the present, adequate access to capital for network enhancement, and a limited threat that new offerings would impact existing revenues. Who's that?

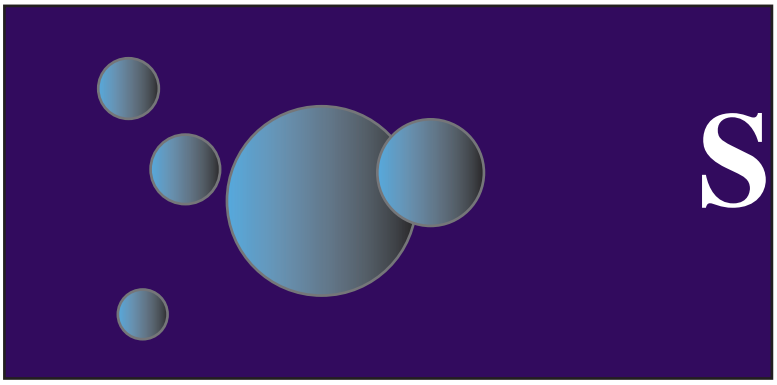
Not the ISPs, clearly. First, they have no real access to capital in today's Wall Street climate. Second, they have minimal account control except in specialized Internet-specific business areas, where service expansion is problematic. Finally, the IP service model makes introduction of new services difficult because incremental usage isn't generally charged.

IXCs have their challenges, too. Their capital access is good relative to CLECs and ISPs, but their financials have been worsening and Wall Street may yet pull back from further investment. They have account control of the largest accounts, however, and this makes it possible for them to launch a new set of services—if they can limit how the marketing of these new services might impact their current service revenues. AT&T's IP-enabled Frame Relay (IFR) shows that this balancing act can be negotiated successfully. Thus, we think these guys could play if they're still stable when the market emerges from the current slump.

The ILECs (primarily the RBOCs) are the clear winners. They have account control, and ready access to capital. Their expansion into the interexchange market in general, and the data market in particular, is effectively a green-field opportunity for them, so they don't have to position new service offerings far away from current demand paradigms to avoid overhanging current revenues. Barring a major regulatory defeat (which could well defeat the whole market), these guys win.

That, of course, is why we advocate letting those RBOC kids play, so to speak. It's not that we love RBOCs particularly, but rather that we'd love to have an optimal industry. We don't see any other way of getting one, and we think that the business factors we outlined here suggest that the RBOCs will win in any event. Go with the flow, optimize the RBOCs' success in public policy goal terms, and get on with it—that's the message of the numbers.

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# Strategies

Telecom is a mess. You know that's true when a publication like *Business Week* decides to publish its own commentary on how to save the industry. One might wonder, though, if they're the best people to decide what measures would work. We don't recall their raising the warning cry back in the '90s when all the problems that killed growth were first emerging.

In any event, we're glad to see that major publications recognize that there's a problem, and that measures beyond just Fed loosening of credit will be required to fix it. We're not completely sold on their remedies, though, and we though it might be interesting to review the points the publication suggests and offer our own comments. For those interested in reading the complete article, it can be found on page 60 of the August 13th 2001 issue.

The article opens with a telling anecdote; a Senator tells the FCC Chairman (Reed Hundt at the time) "We gave one side everything they wanted, and then we gave the other side everything they wanted." It also points out that the industry and the population all had their expectations for the results of the Act, and that everyone on the outside felt as much a sense of entitlement as those insiders who got "everything they wanted." It goes on to offer eight points or lessons, some of which are really recommendations. It's these eight points that we'll examine here.

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