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bandwidth

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Four Years After the Fall: Asia Ascends; Europe Awakens; America Awaits

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Normally after passage of landscape-altering legislation, the early milestones for evaluating its impact on the affected industry are one, five and ten years. That impact is of course determined in significant measure by actions taken by the regulatory body charged with implementing it. Complicating assessment of the 1996 Telecommunications Act's impact are two intervening mega-events: (1) the March 2000 collapse of the dot.com bubble, which sent the entire telecom industry into free fall; and (2) WorldCom's 2002 declaration of intent to file for bankruptcy, upon revelation that its executives had committed the most massive financial fraud in American business history. At the start of 2004 the Act sits squarely between the five- and ten-year signposts, a time ordinarily not suited to take stock. But developments in 2003 make an interim assessment desirable.

Four Years After the Fall: Six Signposts

The year 2003 saw six developments that will play key roles in defining telecom's future for the remainder of the decade: (1) the FCC's Triennial Review Order; (2) the re-emergence of MCI; (3) the Ninth Circuit's ruling striking down the FCC's differential regulatory treatment of telco and cable broadband services; (4) the digital content wars; (5) Asia's broadband starburst; and (6) the swelling wireless wave. For the most part they augur ill for US telecom.

The FCC's Triennial Review Order and Its "Two Imbecile" Rule

Unless reversed on appeal (probable, in light of the recent oral argument before the appeals court) the FCC's new broadband policies will prolong the agony of the US telecom industries.

With respect to incumbent local exchange carriers (ILECs) the new rules fully deregulate only new "green-fields" fiber build-outs, while retaining legacy rules for old plant and the old components of hybrid plant. Legacy plant can only be deregulated after the companies navigate their way through a matrix of Byzantine complexity. Even the existence of actual market competition does not necessarily trigger regulatory relief. Only if at least three self-providers or two non-ILEC wholesalers enter will the FCC's competition threshold be met. Even then, entrants get three years of "grandfather" protection under the old rules. The FCC includes ordinary start-up costs as evidence of entrants not having fully equal network access, despite a federal appeals court's admonition to ignore such costs.

Simply by declining to serve all customers an entrant can avoid losing the steep access discount price—typically about 50 percent—it enjoys. The net real-world effect of the FCC's new rules—failing two imbecile entrants willing to forfeit their huge network access discount to serve grandma at a loss—will be to perpetuate the current regime of subsidized network access for non-ILEC entrants.[1]

The FCC's position stands in stark contrast to the real-world marketplace: As of March 2003, 95.5 percent of US households have at least one phone.[2] As of September 1, 2003, ILECs provided 155.9 million access lines and wireless providers 147.6 million subscribers; press reports now show wireless at 155 million. Competitive Local Exchange Carriers (CLECs) provided 26.9 million access lines, 14.7 percent of the total, up from 11.4 percent in 2002. Cable companies served 3 million access lines. Most significantly—an indicator of the bias in FCC unbundled access rules—CLECs now derive 58 percent of their access via Unbundled Network Elements

(UNEs), up from 24 percent at year-end-1999; conversely, CLEC resold access lines dropped in the same period from 43 percent to 18 percent.[3] (Only 6 percent of wireless service is provided by resellers.[4])

Broadband—not to be confused with vastly faster service available in some Asian and European countries (more on this later)—subscribership rose 18 percent (from 19.9 to 23.5 million lines) in the first half of 2003, an increase slower than the 23 percent growth for the second half of 2002. Advanced service—two-way broadband—reached 16.3 million users, up 32 percent in the first half of 2003, and now accounts for 69.4 percent of all broadband lines.[5]

Cable broadband, by growing at nearly identical rates but from a larger base, continues to outpace DSL subscribership. At mid-2003, cable broadband served 13.7 million customers, up 20 percent, while DSL subscribership rose 19 percent to 7.7 million. Cable provision of advanced services grew faster than DSL, 22 percent versus 18 percent in the first half of 2003, and over twelve months 75 percent versus 37 percent.[6] Overall, ILECs accounted for 35 percent of broadband connections.[7] But only 400,000 domestic customers get bi-directional services at greater than 2 Mb/s, a pittance compared to Asia's leaders.[8]

DSL has a long way to go to catch cable. Having invested $75 billion since passage of the 1996 Act, cable now leads in broadband, and even accounted for 3 percent of new jobs created between 1990 and 2002. The average cable bill, at $40 per month, is lower than most DSL bills.[9]

MCI: Return of the Prodigal

Courtesy of a bankruptcy judge and the FCC's indisposition to enforce its radio license "good character" rules, MCI gets the chance to compete in long distance (LD) with a state-of-the-art fiber network, essentially built for free—the $35.8 billion debt discharged under Chapter 11 virtually equals the $38 billion construction cost. That there are seven major telecom carriers now in long distance (the FCC has approved Bell in-region LD entry everywhere save in Arizona), and cable ready to poach customers, does not faze the FCC. Competitor welfare above all—unless one is an incumbent local exchange carrier—is the agency's lodestar.

Worse, MCI's re-emergence from regulatory purgatory comes on the heels not only of the most massive financial fraud in American history, but also after several credible charges of access fee fraud at the expense of customers (including the federal government), evading state taxes by funneling MCI's telephone revenues through Delaware as tax-free intellectual property, and the most massive traffic fraud ever—a vast inflation of Internet traffic figures which in turn caused a misallocation of tens of billions of dollars in excess equipment and fiber optic investment. The "good character" requirements of FCC radio license rules have been, for this case at least, declared "inoperative."

Were the FCC to have invoked those rules and forced forfeiture of the licenses, the company would have had to file for a Chapter 7 liquidation, rather than a Chapter 11 financial re-organization. The company claims that installation of new management fixes all problems, but if hiring new executives could avoid radio license forfeiture it is hard to see the rules having any real-world applicability. Bet on the FCC to atone for its conveniently averted gaze here by coming down hard someday on some hapless wayward licensee not large enough for the agency to deem worth saving under the "too big to fail" variety of competitor welfare.

The Emperor's Regulatory Raiment--NOT

The U.S. Court of Appeals, Ninth Circuit (one of twelve intermediate appellate courts, the middle level of the federal system) nullified the FCC rules classifying cable modem Internet service as an "information service" per the 1996 Telecom act, and thus not subject to its open access rules. The Court rejected the FCC's claimed technical distinctions between Digital Subscriber Line (DSL) service that led to DSL being deemed a "telecommunications service" under the 1996 law, subject to open access. The Court also rejected the FCC's alternative justification for differential regulatory status, namely, the historic status of telephone companies as common carriers of voice service.

By removing the FCC's fig leaf the Ninth Circuit ruling, if upheld, will force the FCC to either re-regulate cable and deregulate telephone broadband, or else concoct an alternative rationale for keeping current regulation on telcos. The political cost to the agency of re-regulating cable will prove too high to bear. Look for policy gymnastics from an agency determined to keep Bells in harness.

Asia Ascends; Europe Awakens

The US is falling farther behind in broadband every day that megabit-plus service remains an extreme rarity. Calling what we have "broadband" and using the same term for South Korea's broadband service is like equating Wilbur & Orville's craft with an F-22. As the chart below shows, domestic access speeds are closer to those in the northern part of the Korean peninsula than to the southern.

Steve Forbes has characterized the FCC's regulation of telecom as being more in the spirit of the North Korean regulatory model than ours. Sadly, he is right.[10]

Nevertheless, US broadband—more aptly termed "Broadband Lite," proceeds apace. Yankee Group estimates that at year-end 22.5 million households, or 21 percent, will enjoy multi-hundred kilobit Internet access, of which 7.4 million are businesses; by 2008 Yankee sees half of US households with Broadband Lite.[11] Cable is king, with market leader Comcast having more than twice the share of any telephone company.[12]

South Korea's 75 percent penetration leads the world, followed by Canada at 36 percent and Japan at 27 percent.[13] South Korea's 21.3 lines per 100 households leads world per capita broadband penetration, ahead of Hong Kong's 14.9 lines and Canada's 11.2, with the US in eleventh place at 6.9.[14] Time spent online, surveys have shown, increases with broadband, especially full-length movie downloads.[15] Thus, a richer fabric of broadband applications is being spun overseas.

Japan has gone from 1.6 million broadband subscribers in 2001 to 11.8 million in August 2003,

BROADBAND TODAY

South Korea:	8 Mb/s downstream; 1 Mb/s upstream
USA Typical Speed:	500 kb/s downstream; 64 kb/s upstream
FCC Definition:	200 kb/s downstream
North Korea:	0 kb/s no stream

a jump of more than seven-fold. Since 1999 Japan's home Internet penetration has doubled, from 20 to 40 percent. Japan's telecom ministry sees by 2007 a $90 billion broadband market. In 1999, the incumbent network access was opened to new entrants, creating intense competition, leading to increased Internet use and larger bandwidths: Incumbent telephone provider NTT, 45 percent government-owned, has dropped to less than 40 percent of the broadband market, and NTT East's March 2003 call volume dropped 31 percent year-over-year (YoY). New entrant Softbank's Yahoo BB service began offering 8 Mb/s access in September 2001; Softbank subsequently upgraded it offer to 12 Mb/s in August 2002, 26 Mb/s in July 2003. Another competitor, eAccess, rolled out a 40 Mb/s service in October 2003; NTT East plans to match this.[16]

And while America sleeps—thinking its "Broadband Lite" policy a success—notoriously sleepy Europe awakens. On August 3, 2003 Berlin became the world's first city to completely phase out analog television transmission in favor of digital, a step the FCC hopes the US will complete nationwide in 2006 but which some TV CEOs see not until 2020. One prediction: 23 million (28 percent) of Germany's 82 million population will receive digital TV service by May 2004. Berlin broadcast television's 12 analog channels are now 28 digital channels, using only 7 of the 12 frequencies.[17]

A Milan entrepreneur is building a fiber-to-the-home network providing 10 Mb/s access to 20 percent of residents. His company, e.Biscom, offers video-on-demand at $5.80 per film, with a digital library of 1,500 films and 2,000 television programs. Ignoring Gartner's anti-fiber forecast that DSL's Italian market share will grow from 85 percent now to 88 percent by 2007 (with fiber falling from 14 to 10 percent), the company has Pirelli Labs working on a converter box to enable a hundred-fold capacity jump. Is the broadband future gigabits for Gianni, megabits for Myung and kilobits for Kansas?

European cable firms are positioned quite differently from their American counterparts. Because European cable firms are not offering Internet access, DSL has a 97 percent Internet access market share in France, Germany and Britain.[18] American cable and satellite companies also trail in per capita deployment of interactive television. UK firms have 7 million interactive customers, while in the far more populous US there are only 7.6 million (Echostar alone has 6 million).[19]

Wireless Wave

Compounding the FCC's regulatory harm to wireline telephone companies is the emergence of wireless as an access alternative, siphoning Bell company wireline revenues. Already some 5 percent of users have chosen wireless as their primary phone; wireless number portability will, by one estimate, increase that number to 20 percent within five years.[20]

Union Bank of Switzerland forecasts that for 2003 Bell company wireline revenues will be $143 billion, down five percent; investment banking house Legg Mason sees wireless revenues for the top six carriers reaching $77 billion, up 10%. Should these profit trends continue, as seems highly likely, the industry revenue figures will cross early in 2008 (Bell wireline revenues at $110 billion in 2008; the top six wireless carriers at $133 billion in 2007).[21]

Consultant firm J.D. Power offers more evidence of the eroding wireline core: Already, wireless displaces some 20 percent of landline long distance calls, e-mail another 19 percent, and another 6 percent are lost to instant messaging and Internet voice. That is 45 percent of long distance calls. Add to this some 30 percent of local calls (15 percent wireless, 10 percent e-

mail, 5 percent other).[22] Wireless minutes-of-use were up 38 percent in 2003; Lehman Brothers estimate that traffic will increase another 25 percent in 2004. Between 2001 and 2003 average subscriber monthly usage soared from 375 to 573 minutes; Lehman sees 638 minutes average use for 2004 (the remainder of the traffic growth it sees would come from adding subscribers in 2004).[23]

And wireless data is finally realizing its long-heralded potential. Merrill Lynch estimates that wireless data already accounts for 22 percent of telecom revenues in Japan, 16 percent in Germany and the UK, 11 percent in France and only one percent in the US. Europeans send twenty times as many wireless e-mails as do Americans. As telecom maven Peter Huber points out, US spectrum for wireless is little more than half that allocated by European and Asian governments, and thus the US is way behind the world leaders in wireless data usage. Uncle Sam even trails Brazil, no less, where wireless data revenues are two percent of the total, twice the US number.[24]

Japan has become the launching pad for 3G broadband wireless. NTT DoCoMo initiated service in 2002, and had 1.6 million subscribers with one month to go in 2003. DoCoMo plans to add 12 million more users in 2004. By 2005 25 percent of Japanese cell users may use 3G; 3G customers spend 230 percent more money than their non-3G brethren on music, videos and games. AT&T plans to start 3G in the US in 2004, but the real 3G action is in the Land of the Rising Sun.[25]

Cellphones are now status symbols-with the color screen fad now giving way to the camera craze. Shrinking phone size—Motorola's latest model, at 2.8 ounces, is precisely one-tenth the company's original 28-ouncer—is not enough. Color phones caught on despite initially costing 20 percent more than B&W models. In Japan, camera phones comprise 80 percent of phone sales in their third year on the market; European camera-phone sales are crossing the 20 percent threshold. As with broadband, Asia is leading the way.[26]

Global wireless investment, however, is constrained by the overall pullback in telecom capital spending. Domestic wireless spending will be about 20 percent of gross sales in 2003, down from 30 percent in 2002. Overseas, Vodafone anticipates an investment rate of only 10 percent of sales in 2008. Prices of network equipment have fallen accordingly, now at a 13 percent annual rate of decline.[27]

And as 2004 begins so does the first phase of wireless consolidation. If the Cingular/AT&T merger is approved, the top two firms will have 83.5 million (54 percent) of 155 million wireless subscribers, and the top five firms will have 124.8 million (81 percent). The domestic nationwide wireless market simply will not support six carriers, nor, in all likelihood, even five.[28]

Digital Duels

The flood of lawsuits unleashed by the record industry against prolific file sharers brought digital content issues front and center. The consuming public saw firsthand how digital rights management has altered the traditional balance between rights of copyright holders and rights of the public. While in the short term the Recording Industry Association of America (RIAA) posted victories, it has finally begun seriously selling online music on a per-song basis. In the long run, the consuming public will have its way. Old business models may never die, but, like old Cadillacs, they will fade away.

A federal appeals court overturned a lower court ruling requiring Verizon to turn over to the RIAA the names of subscribers who used peer networking to share music files, deriding as "silly" the RIAA's contention that Verizon,

as a common carrier, was responsible for acts of its subscribers. This re-affirms the traditional view of common carriers not being liable for content transmitted over their networks. The panel held that the Digital Millennium Copyright Act of 1998 did not contemplate peer networking transfers.[29] And the highest court in the Netherlands ruled that KaZaA software creators were not liable for how owners use the software—even if it involves sharing of files without paying music companies.[30]

In 2003 the RIAA settled 220 of 382 suits, induced 1,054 users to sign "amnesty letters" and warned 398 others about illegal copying.[31] (RIAA started off 2004 by filing 532 additional suits—targeting defendants by computer address, because Verizon's court victory denied RIAA access to customer names.[32]) Record moguls have some Christmas cheer: In 34 of 36 weeks prior to launching their legal assault the companies saw CD sales fall on a year-over-year basis, but in the 11 of 14 YoY weeks since CD sales have risen; meanwhile, KaZaA users, fell from a 17.4 million peak in March to 7.6 million by October, a 56 percent drop.[33]

Conclusion

The rise of Asia cannot be understated. By Asian bandwidth standards, America's broadband penetration is one-sixth of one percent of American households—i.e., the 180,300 homes that have fiber access, with actual usage of 64,700. To get our currently claimed 20 percent figure requires accepting the FCC's absurd "four times dial-up access speed" definition of broadband, but that is Lite broadband indeed. Slightly speedier web page access and rinky-dink downloads of trashy music should not be accepted as America's standard for high-speed Internet access. Sadly, it appears unlikely that even with regulatory reform it is unlikely that the US can catch Asia this decade. But reform would be a start in what will be a long road in search of recovering a lost lead.

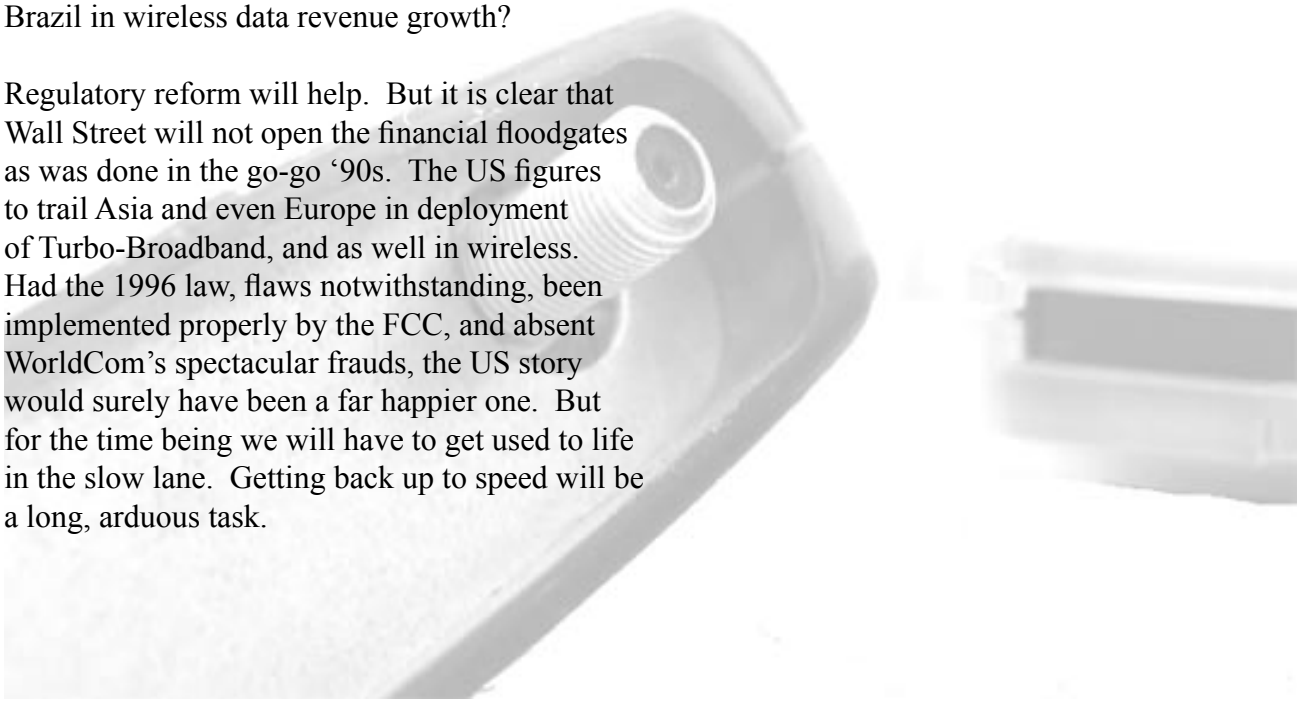
The severity of American telecom decline has been partially masked by robust second-half economic growth last year, driving revenue growth in the increasingly cyclical telecom industry. According to Bernstein Research, during the 1992 economic recovery 85 percent of telecom service revenues came from wireline voice, versus 8 percent wireline data and 7 percent for wireless. In 2003 voice represented only 40 percent of industry revenues, while wireline data's share more than tripled to 23 percent, and the share attributable to wireless (voice and data) more than quadrupled to 36 percent.[34]

The benefits of broadband are not theoretical. Beyond myriad new services to which consumers would enjoy access, there are economic benefits: Two consulting firms have estimated (independently) that broadband deployment would add 1.2 million jobs to the American economy.[35]

Federal and state regulatory policy still adheres to historical perceptions that the incumbent telephone companies remain the dominant players in the telecom universe. It's not that they are unaware of the changes underway in the marketplace. Rather, they simply deny their real-world impact. Consider this: From a peak of 187.6 million lines, four years of decline have reduced the local telephone access line count to 155.9 million by mid-2003, a decline of one-sixth. In the same period, CLEC lines more than tripled, from just under 8 million to 26.9 million. The last time local carrier access lines were lower than the latest total was 1995, when the line count first passed 150 million. In other words, local carriers now have lost all access line gains made since passage of the 1996 Telecom Act.[36]

The first step is to stop calling Asian and US high-speed access by the same name—just as an F-22 does a few things World War I biplanes

could not do, so Asian high-speed is in a different class of service. Call what Asia's leaders have "Turbo-Broadband"; call what we have a set of services that range from Narrowband Deluxe to Broadband Lite. Thus we have but 64,700 Turbo-Broadband users in the US today—400,000 if "Turbo" is defined down to 2 Mb/s access speed. With the broadband deployment experience resembling the history of wireless, the US is a follower, not a leader. Who would have thought, at the time the Telecom Act was signed in February 1996, that a mere eight years later the US would trail South Korea in broadband and Brazil in wireless data revenue growth?



Regulatory reform will help. But it is clear that Wall Street will not open the financial floodgates as was done in the go-go '90s. The US figures to trail Asia and even Europe in deployment of Turbo-Broadband, and as well in wireless. Had the 1996 law, flaws notwithstanding, been implemented properly by the FCC, and absent WorldCom's spectacular frauds, the US story would surely have been a far happier one. But for the time being we will have to get used to life in the slow lane. Getting back up to speed will be a long, arduous task.

[ET CETERA]

UN-Thinkable. Developed countries beat back an attempt by Third World nations to establish UN-based governance over the Internet. Instead, countries will meet with private sector groups to study Internet governance and report by 2005.[37] Global growth of Net use is driving calls for shared governance; China, which now has fewer e-addresses than does MIT, may have more than half of global Net users by 2007. Of particular concern is technical management of the Internet, now under the auspices of ICANN, the Internet Corporation for Assigned Names and Numbers. ICANN's chairman attempted to observe the UN Geneva meeting but was barred; ICANN allows open observance of its proceedings.[38]

Homeland IN-Security? The Department of Homeland Security (DHS) was one of eleven federal agencies that received a failing grade from a House subcommittee for 2003; also failing were the Justice and Defense departments. Only two of 21 graded agencies got an A or A-minus. Silver Lining: One of the top two was the Nuclear Regulatory Commission.[39] A personal note: The author recently went to DHS's website to download a report recounting problems—including communications infrastructure deficiencies—encountered by DHS in a major multi-city bio-terror exercise. The result was a pop-up warning from the author's firewall software that "malicious script" had been detected! The firewall program recommended abandoning the download. (A similar problem cropped up when the author attempted to download an FCC rulemaking notice on the TELRIC cost standard.)

If THIS Computer Is Not Safe…. Romanian hackers were arrested for posting a blackmail threat on a computer last May—at the South Pole Research Center. The server controlled life-support systems for the people working there.[40]

High-Definition or Hide-Definition? HDTV rose this past holiday season, part of a 56 percent jump in digital TV sales. But lighting magicians are now being used by directors to hide blemishes of the stars that were not visible on conventional TV. A "skin detail" feature on HDTV cameras enables blurring of flesh tones while keeping the rest of the picture in high-definition resolution. Make-up artists use airbrush techniques to spray mist on their celebrity clients.[41]

Online Commerce Comes On. In 2002 B2B (business-to-business) online commerce reached $482 billion, up 242 percent from 2000's $141 billion. B2C (business-to-consumer) online transactions hit $71 billion in 2002, pushing online commerce past the half-trillion mark, to $553 billion.[42]

Arab Info-Poverty. A United Nations Development Program report released in October notes that Arab countries have 18 computers per 1,000 people, with less than two percent having Internet access; the world average for computer penetration is 78 computers.[43]

Online Banking Offline? Jupiter Research counts 29.6 million online bankers to date, and sees another 5 million signing up in 2004. But how many are truly active? According to consultant firm Financial Insights, a division of International Data Corp., only 8 percent execute account transfer or bill payment transactions as frequently as every 45 days.[44]

It's a Worm, It's a Bane, it's Super-Spammer! Spammers have refined the summer 2003 SoBig virus, which caused havoc by combining two elements: its Trojan Horse design (a "Trojan Horse" program conceals malicious code within an ostensibly legitimate program), and the peer-to-peer architecture of the music file-sharing program KaZaA. The result is spam programs that are virtually impossible to trace, as they hide within countless computers whose resources have been surreptitiously commandeered. Security ace Bruce Schneier says that hackers increasingly are no longer kids spraying software graffiti for kicks, but rather are commercially inclined. Software kryptonite wanted, ASAP.[45]

Spam-a-Claus. Spam, which Brightmail estimates was 56 percent of e-mail in November, may be 80 to 90 percent of holiday season mail. One result: a survey of Net users shows that 37 percent will pass up online shopping to avoid spam.[46] Spam imposes unwanted costs estimated at $10 billion worldwide annually.[47] Yet the world's 15 billion daily spam messages bear commercial fruit: In the US alone, 7 percent of online users have made a purchase in response to unsolicited commercial e-mail (for which the FTC uses the acronym UCE).[48]

FTC Bombshell: Spammers Lie! An April 2003 survey conducted by the Federal Trade Commission yielded some fascinating metrics about commercial spam, classified into eight categories: investment/business opportunity, adult, finance, products/services, health, computers/Internet, leisure/travel, education and other. Detailed analysis of 1,000 spam messages (a small sample size given 11 million in the databases the FTC checked) showed that 86 percent of addresses posted online were hit, and that 63 percent of removal requests were ignored. The largest category of spam, investment/business opportunity, was 20 percent of the total, with 90 percent of those messages containing false claims in message text (adding in falsehoods in the "from or "subject" lines made the total for this class 96 percent false). In all, 66 percent of spam contained falsehoods in either the "from" or ""subject" lines, or in message text. Only two percent of spammers honored state laws requiring the use of ADV in the subject line.[49]

Tenth Tames the First. The U.S. Court of Appeals for the Tenth Circuit has affirmed the FTC's telemarketing do-not-call rules, rejecting telemarketer arguments that the rules infringe upon their First Amendment rights. The latest FTC figures show more than 55 million phone numbers registered, covering 57% of US adults. In 2003 the FTC received 150,000 complaints.[50]

(Endnotes)

[1] For a more detailed analysis of the FCC's August 2003 Triennial Review Order, see *Broadband Ballet: The FCC – State Pas de Deux,* Bandwidth, Sept. 15, 2003. < http://www.discovery.org/bandwidth >

[2] *FCC Releases New Telephone Subscribership Report,* FCC News (Nov. 4, 2003).

[3] *Federal Communications Commission Releases Data on Local Telephone Competition*, FCC News (Dec. 22, 2003).

[4] *Local Telephone Competition: Status as of June 30, 2003*, p. 3, Industry Analysis and Technology Division, Wireline Competition Bureau (December 2003).

[5] *Federal Communications Commission Releases Data on High-Speed Services for Internet Access*, FCC News (Dec. 22, 2003).

[6] *Id.*

[7] *High-Speed Services for Internet Access: Status as of June 2003*, p. 3, Industry Analysis and Technology Division, Wireline Competition Bureau (Dec. 2003).

[8] *Id.*

[9] Source: National Cable Television Association.

[10] *Gilder/Forbes Turnaround Telecosm*, August 26, 2003.

[11] *Profiting From the Broadband Revolution,* Wall Street Journal, Telecommunications Supplement ("WSJ-TS"), p. R1 (Oct. 13, 2003).

[12] *It's Not Over Yet,* WSJ-TS, p. R4. Market share figures as of mid-2003: Comcast, 19.8%; Time Warner, 13.4%; SBC, 12.5%, Verizon, 8.7%; Cox, 7.6%, Charter, 6.1%; BellSouth, 5.5%; Cablevision, 4.2%; Qwest, 2.5%; Covad, 2.0%. Source: Current Analysis, Inc..

[13] *What's Slowing Us Down?*, WSJ-TS, p. R4. Sources: RHK Inc., International Telecommunication Union (ITU), Gartner, Inc.

[14] *Id.* Source: ITU.

[15] *The Fabric of Our Lives,* WSJ-TS, p. R8. Relative use figures for broadband versus dial-up: music downloading, 38% v.15%; software/games, 35% v. 16%; video trailers/film previews, 28% v. 8%; full-length films/videos, 8% v. 2%; electronic books, 4% v. 3%. Source: Gartner, Inc. Online video games racked up $28 billion in domestic sales in 2002, and are growing 20 percent per year. *Playing Mogul,* New York Times Magazine, p. 36 (Dec. 21, 2003).

[16] *A Web Maverick Sparks a Revolution in Wiring Japan*, Wall Street Journal, P. A1 (Oct. 17, 2003).

[17] *German Way to Go Digital: No Dawdling*, New York Times, p. C1 (Nov. 3, 2003). Germany's combined cable/satellite household penetration is identical to that in the US, 91 percent (31 of 34 million v. 96 of 106 million). (The cable/satellite mix differs: Germany is 56 percent cable and 35 percent satellite; US is 70 percent cable and 20 percent satellite.) Berlin's 1.8 million viewers included 160,000 with "rabbit ears," of which 6.700 (4 percent) received assistance to purchase set-top converters.

[18] *In Milan, Working to Unfurl a High-Tech Blanket of Fiber*, New York Times, p. C4 (Nov. 3, 2003).

[19] *Cable Operators Gear Up to Offer Interactive TV*, Wall Street Journal, p. B1 (Jan. 22, 2004).

[20] *Telemarketers' Next Target: Cell Phones*, businessweek online Tech Report, businessweek.com, 10/14/03. Source: Farpoint Group, Ashland, Massachusetts.

[21] *A Wireless World,* Special Report: Telecom, Source: BusinessWeek Online, 1020/03. (Subscribers only.) UBS estimates the Bell wireline profit margin will be 35 percent in 2003, down from 38% in 2002. Legg Mason estimates wireless profit margins will rise from 31% in 2002 to 33% in 2003.

[22] Source: J.D. Power.

[23] *Wireless Services: Industry Update*, Lehman Brothers (Dec. 5, 2003).

[24] Huber, Peter, *Data on the Move,* forbes.com, 12/22/03. < http://www.forbes.com/forbes/2003/1222/115.html >

[25] *Cellphones: An Industry Watches Japan's Experience*, New York Times, p. C4 (Dec. 29, 2003).

[26] *Cellphone Makers Pay a Heavy Toll For Missing Fads*, Wall Street Journal, p. A1 (Oct. 30, 2003).

[27] *Global Telecom Stocks Reconnect But Expect More Static*, Wall Street Journal, p. C1 (Dec. 5, 2003).

[28] *Big Name Mergers Won't Ease Crowding in Cellphone Industry*, Wall Street Journal, p. A1 (Feb. 13, 2004). Post-merger wireless market shares would be: Cingular/AT&T Wireless, 29.8%; Verizon Wireless, 24.3%; Sprint, 10.3%; T-Mobile, 8.5%; Nextel, 8.0%.

[29] *Record Industry May Not Subpoena Providers*, My Way News, 12/19/03. The precise ruling of the federal appeals court, per Chief Judge Douglas Ginsburg: Under the Digital Millennium Copyright Act, Internet Service Providers who merely serve as a conduit, and perform no storage functions (caching, hosting or locating) are not required to disclose subscriber names in response to a subpoena seeking the names of possible copyright infringers. The Court further noted that because the DMCA language is clear there is no need to resort to the legislative history, but in the event Congress did not contemplate peer-to-peer networking when it wrote the law. Recording Industry Association of America v. Verizon Internet Services, Inc., No. 03-7015 (consolidated with No. 03-7053), US Court of Appeals, DC Circuit, Dec. 19, 2003 (slip opinion).
< http://apnews.myway.com/article/20031219/D7VHI7400.html >

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< http://news.yahoo.com/news?tmpl=story2&cid=575&u=/nm/20031219/wr_nm/media_kazaa_dc_6&printer=1 >

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[32] *A Reprise of Lawsuits Over Piracy*, Washington Post, p. E1 (Jan. 22, 2004).

[33] *Music Industry's Move Against Swappers Hits a Snag*

Just as Impact Takes Hold, Wall Street Journal, p. B1 (Dec. 22, 2003). Sources: Sales figures from Nielsen SoundScan; KaZaA users from Nielsen NetRatings.

[34] *US Telecom: A Cautious Investment Thesis in Perspective,* Bernstein Research Call, pp. 2 - 3 (Dec. 5, 2003).

[35] Brough, Wayne T., *State Economies Can Benefit From Broadband Deployment*, Issue Analysis, CSE Freedom Works Foundation (Dec. 1, 2003).

[36] *The Bells Struggle to Survive a Changing Telephone Game*, New York Times, p. C1 (Nov. 24, 2003). (N.B., the CLEC figure is from the FCC report cited in fn. 4, supra.)

[37] *U.N. Control of Web Rejected*, Washington Times, p. A1 (Dec. 8, 2003).

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