

TIA's TechTrends: Fall 2009

In this Issue

FCC Launches Net Neutrality Debate

The controversial net neutrality debate heats up.

App Stores Driving Smartphone Market

Explosive growth in App Stores is fueling a surging smartphone market.

Wireless Spectrum Shortage

Growth in app downloads and wireless data in general are putting pressure on the FCC to allocate more spectrum for commercial wireless services.

Broadband Stimulus

The first round of applications demonstrates widespread interest in new projects to extend broadband penetration.

Videoconferencing

Cisco's acquisition of Tandberg reflects the growing demand for videoconferencing.

Mobile Television

New technologies are creating a platform for this emerging application.

About TIA

Find out about additional TIA programs and offerings.

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The FCC Launches Net Neutrality Debate

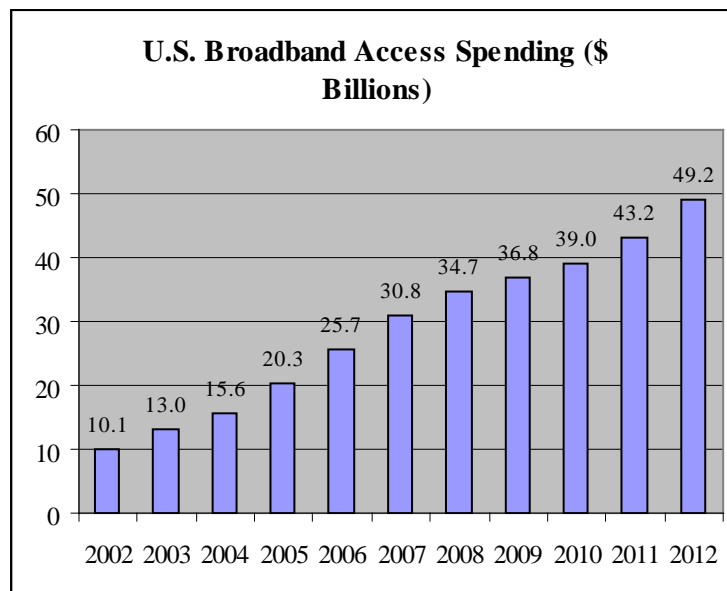
On October 22, the FCC released a Notice of Proposed Rulemaking proposing the adoption of net neutrality rules and seeking comment from the public. The Notice proposes that all broadband service providers – no matter what platforms they use – should be required to adhere to the four “principles” set out in the Commission’s 2005 *Internet Policy Statement*. Under these rules, providers would be required to permit users to access legal content, to use legal applications, to attach and use personal devices, and to enjoy competition among operators and providers of applications, content and services. In addition, the Notice proposes that broadband providers should be prohibited from favoring or disfavoring any lawful content, and be required to submit information regarding their network practices to consumers, the government, and applications developers. These requirements would be subject to exceptions for reasonable network management and for the needs of law enforcement, public safety, and homeland and national security. The FCC also contemplates an exception for managed and specialized services, and seeks comment on how all of these exceptions should be implemented. The Notice states that the FCC envisions enforcing whatever net neutrality rules it adopts on a case-by-case basis.

AT&T and Verizon have accepted the *Internet Policy Statement*’s principles with regard to the wired Internet but argue against imposing the same rules on the wireless industry. They argue that the wireless industry should be treated differently because of limited bandwidth, and state that open access requirements would make the wireless spectrum less valuable. The carriers argue that the mobile wireless industry is competitive enough that it doesn’t require government intervention and that unfettered Internet access could overburden the wireless networks. On the other hand, content providers like Google and public interest groups are in favor of the net neutrality rules being extended to the wireless industry.

Network openness issues have attracted much interest in recent years, particularly in connection with practices put in place by providers to manage the enormous demands being placed on broadband networks. In August 2008, the FCC sanctioned Comcast for blocking certain subscribers from using BitTorrent’s peer-to-peer file-sharing technology. That action, considered a victory for proponents of net neutrality, was the first finding against a major broadband provider for blocking access to an Internet site. Since the issuance of the Comcast decision, providers have struggled to devise network management policies that protect all their users without running afoul of the FCC’s somewhat ambiguous policies. Network openness issues have also arisen in other contexts. For example, the FCC is currently evaluating issues involving mobile users’ access to applications, handset exclusivity deals, and the proper regulatory treatment of SMS messaging and common short codes.

Political support for net neutrality is generally split along party lines. President Obama has publicly stated that he favors net neutrality requirements. In Congress, Rep. Henry Waxman (D-Calif.) Chairman of the Energy and Commerce Committee has co-sponsored a net neutrality bill with Rep. Ed Markey (D-Mass) and Rep. Anna Eshoo (D-Calif.). A handful of moderate Democrats, however, have urged the FCC to act cautiously in considering net neutrality rules. On the other hand, Republicans are generally opposed to net neutrality requirements. A bill was introduced by Rep. Marsha Blackburn (R-Tenn.) and a Senate companion by Senator John McCain (R-Ariz.) stripping the FCC of authority to impose such rules. At the FCC, the October 22 Notice of Proposed Rulemaking was supported by Chairman Genachowski and his two Democratic colleagues, while the two Republicans dissented in part.

The net neutrality issue is poised to become even more pressing in coming months, because global data traffic is surging, and putting pressure on the existing infrastructure. The volume of global Internet traffic rose 55 percent in 2008 and is on track to expand by 74 percent in 2009. In the United States, broadband is one of the fastest-growing components of the U.S. telecommunications market, having more than tripled from \$10 billion in 2002 to nearly \$37 billion in 2009.



TIA's 2009 ICT Market Review and Forecast

Spending on broadband will continue to grow rapidly, projected to rise to \$49.2 billion by 2012, a 34 percent increase from 2009, with much of that growth being fueled by high-speed services that can accommodate high volume applications.

App Stores Driving Smartphone Market

Until recently wireless operators controlled the applications that made it to their phones. Now, platform developers such as Apple, Google, and Research in Motion have developed marketplaces where consumers can gain access to thousands of applications designed specifically for their platforms. These marketplaces provide developers with an easy way to distribute their applications and provide consumers with many choices for additional applications for their devices. Wireless carriers still have the final say over which applications are provided and certify the applications to make sure that they do not hurt the networks. The carriers are enthusiastic about the new applications because they provide an additional revenue stream through increased data usage. Many of the applications are available free of charge which is helping to drive the market. The applications leverage the advanced capabilities of the devices including touch screens, location-based services, and full Web browsing. Applications providing access to news and weather as well as games are the most popular

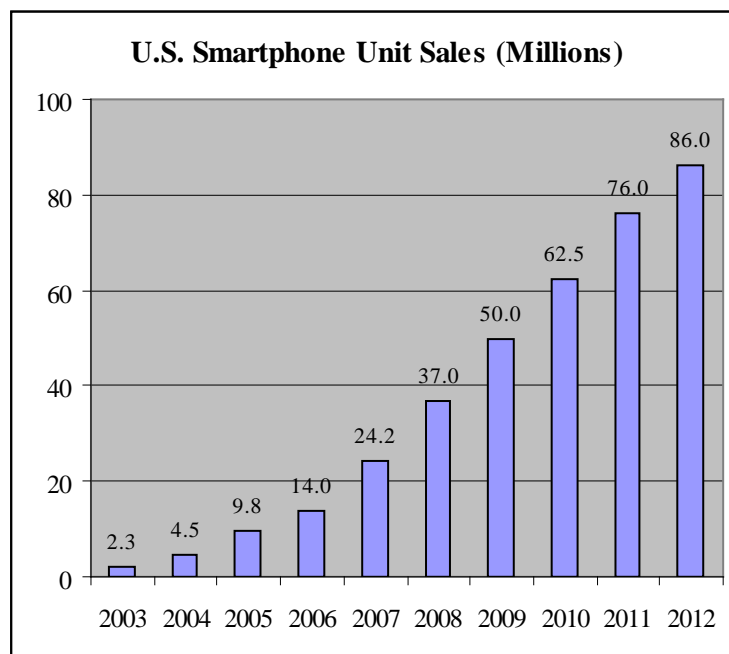
Apple's App Store is the major player in the market. It was launched in July 2008 and currently has more than 85,000 applications designed for the iPhone and iPod Touch devices. The company reported 30 million downloads in its first month of operation and has totaled two billion downloads to date. The company has been promoting the service with an ad campaign entitled "There's an app for that." Apple takes 30 percent of the revenues with the developers collecting the other 70 percent. Apple says that there are over 125,000 developers in the iPhone Developer Program. Health applications that are able to receive and analyze data from medical devices are among the fastest growing categories in the Apple App Store.

Google launched the Android Market in conjunction with the introduction of the first Android phone, the T-Mobile G1 in October 1998. There are about 10,000 applications available in the Android Market. There has been increasing developer interest in the Android platform coming with the new Android handsets. In fact, there were at least 200 new applications that began development in July 2009, up from 50 new applications in March. Research in Motion introduced its Blackberry App World in April 2009 and has more than 2,000 applications available.

Palm has only recently stepped up its development of its App Catalog for its Pre phone, which went on sale in June. The number of apps in Palm's APP Catalog has been quite small as it was limited to free applications since there was no payment system in place. In October, in an attempt to increase its catalog size, Palm opened its App Catalog to paid applications by introducing a payment system. Additionally, Palm announced that developers who wanted to provide free applications could do so without going through a review process, thereby speeding the process. Nokia's

Ovi store launched in May 2009 and Microsoft's Windows Marketplace for Mobile is expected before the beginning of 2010.

In July 2009, Verizon Wireless announced that it was also entering the market and planned to have its App Store in place by the beginning of 2010. Similar to Apple's business model, Verizon will keep 30 percent of the revenues, giving 70 percent to the developers of the applications. Developers who use the VCast Apps store will have access to the carrier's billing system. Verizon announced a partnership with Research in Motion to preload the VCast on some Blackberry devices.



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We estimate there will be approximately two billion applications downloaded for the full year in 2009, a figure that is expected to triple by 2013. The market is being driven by free content subsidized by mobile advertising, quality applications that take advantage of the devices advanced features, and a vast inventory of apps appealing to all interests. iPhone users are more likely to download applications than Blackberry or HTC users as the former are using the phones for personal use while the latter are more likely to use it for business. Almost all iPhone users have downloaded applications while one quarter of the overall smartphone users have yet to download an application.

The availability of apps is driving the smartphone market. Although the overall wireless handset market is struggling, the smartphone component of that market is booming. We estimate there will be 50 million smartphones sold in the United States in 2009, up from 37 million in 2008 and less than 5 million as recently as 2004. By 2012, smartphone unit sales will total an estimated 86 million, a 72 percent increase from 2009.

Wireless Spectrum Shortage

The expansion of App stores and growth in the smartphone universe is putting strains on the wireless spectrum. T-Mobile reports that users of its G1 Android phone download 50 times as much data as the average T-Mobile subscriber. AT&T reports that since the introduction of the iPhone, data usage has increased by 5,000 percent. To accommodate that traffic, AT&T is installing 2,000 new cell towers in 2009.

The CTIA has called upon the FCC to make 50 MHz of spectrum available immediately for commercial wireless services and to allocate an additional 800 MHz of spectrum for the wireless industry by 2015. Currently, wireless carriers have 410 MHz of spectrum. The CTIA recommendation, if enacted, would effectively triple the spectrum available for wireless carriers.

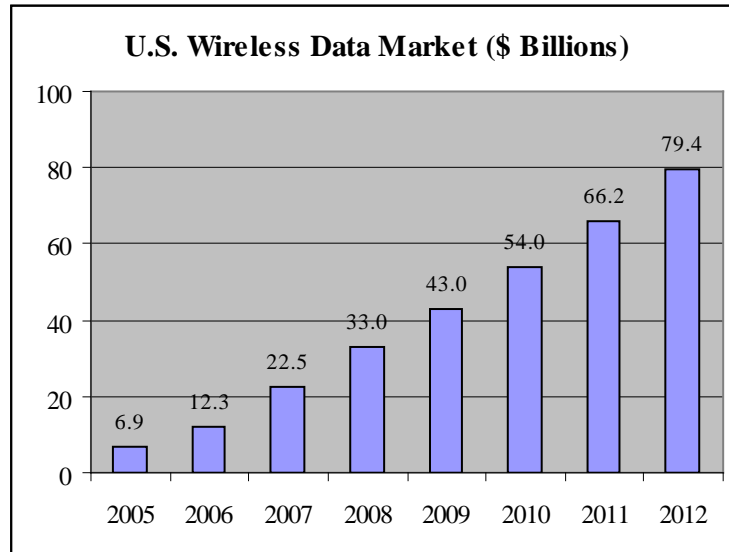
The FCC in September announced it is conducting a review of the current spectrum allocation to determine whether there is enough capacity to handle the expected growth in wireless traffic. The FCC also is developing a National Broadband Plan to expand broadband access that will include the use of the wireless spectrum. As part of these initiatives, the FCC is inviting comments.

The FCC is seeking information on the ability of current spectrum allocations to accommodate the expected surge in demand, which spectrum bands can best support mobile or fixed broadband, issues that could arise in shifting spectrum allocations, and the ability of current spectrum allocations to support backhaul data communications.

Separately, wireless carriers are seeking legislation that would require the government to inventory the spectrum to determine whether there currently are unused blocks. Some carriers are calling for the spectrum that is reserved for public safety usage but currently vacant to be sold to commercial carriers to alleviate the shortfall.

Concern about growth in data traffic is reflected in the surge in spending on wireless data. In just the past four years, wireless data more than quintupled from less than \$7

billion in 2005 to \$43 billion in 2009. Spending on wireless data will continue to be one of the fastest-growing components in the telecommunications industry, projected to rise to \$79.4 billion by 2012, an 85 percent increase from 2009.



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Broadband Stimulus

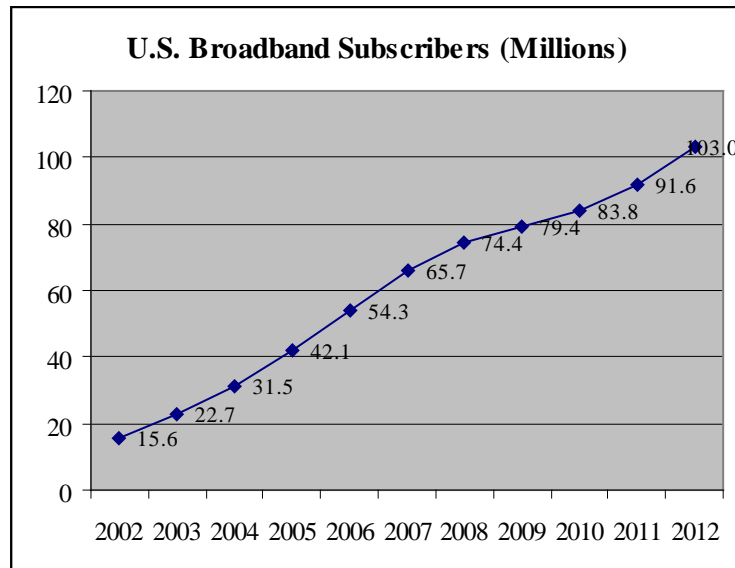
The \$7.2 billion broadband stimulus package, included in the *American Recovery and Reinvestment Act*, signed into law in February 2009, is beginning to be implemented. Funds will be distributed under the Broadband Initiatives Program (BIP) and the Broadband Technology Opportunities Program (BTOP). BIP operates under the Rural Utilities Service in the Department of Agriculture and BTOP operates under the National Telecommunications Information Administration (NTIA) in the Department of Commerce. BIP will provide grants and loans for broadband infrastructure projects in rural areas and BTOP will provide funds for general broadband infrastructure, public computer centers and broadband adoption projects. States can also separately apply for funds. Funds cannot favor some applications over others and must be consistent with FCC policies on net neutrality. At least a third of the funds are targeted to extend broadband to unserved or underserved areas.

While a majority of all households had a broadband connection in 2008, among low income households only about a quarter subscribed to broadband. In addition to income constraints, limited availability of broadband is holding back rural penetration. With cable and DSL, households need to be within 18,000 wire feet of

the nearest node to receive broadband. In sparsely populated areas, the number of potential broadband subscribers is often too low to justify the investment in extending the broadband infrastructure. Fixed wireless, satellite and fiber-to-the-home (FTTH) are technologies with the potential to serve rural markets, but prices are high, availability is currently limited and penetration is low. Consequently, the United States ranks only 19th among all countries in broadband penetration of the population.

The first round of applications for the stimulus funding generated more than 2,000 bids. The majority of applications and funding requests consisted of wireless applications, likely reflecting the fact that wireless technologies are likely to be more economical in providing last mile connectivity, and even middle-mile connectivity, than wireline technologies. There were also a large number of applications from individual states. Total requests for the first round applications were four times higher than the \$7.2 billion in available funds. Given that response, there does not appear to be a need for additional incentives for bidders and the NTIA indicated it may delay the deadline for second round applications to give it time to assess the first round, and may possibly eliminate a third round.

U.S. broadband subscriber growth is beginning to moderate in 2009, in part because of the recession, but in larger part because of limited access to rural areas. We expect that as projects are funded and infrastructure is expanded, the rate of broadband subscriber growth will pick up. We look for growth to accelerate between 2010 and 2012 in large part as a result of the broadband stimulus. The number of broadband subscribers will increase from 79.4 million in 2009 to an estimate 103 million by 2012, a 30 percent increase.



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Videoconferencing

Cisco Systems agreed to acquire Tandberg, the Norwegian-based videoconferencing systems provider, for \$3 billion. Tandberg systems are primarily for desktops although it also makes more expensive units. With its TelePresence systems, Cisco also is in the videoconferencing business with a focus on high-end conference room systems. The deal would make Cisco the largest videoconferencing provider in the world.

The size of the bid, three times revenue and 11 percent higher than the market value, reflects the expectation that videoconferencing is an expanding industry. The data support that expectation. Sales are up significantly in 2009 in an otherwise down market for equipment, and companies are reporting increased use of videoconferencing to reduce travel. While there clearly are benefits to reducing travel costs in a weak economic environment, there also are long-term drivers that will continue to stimulate the market once the economy recovers.

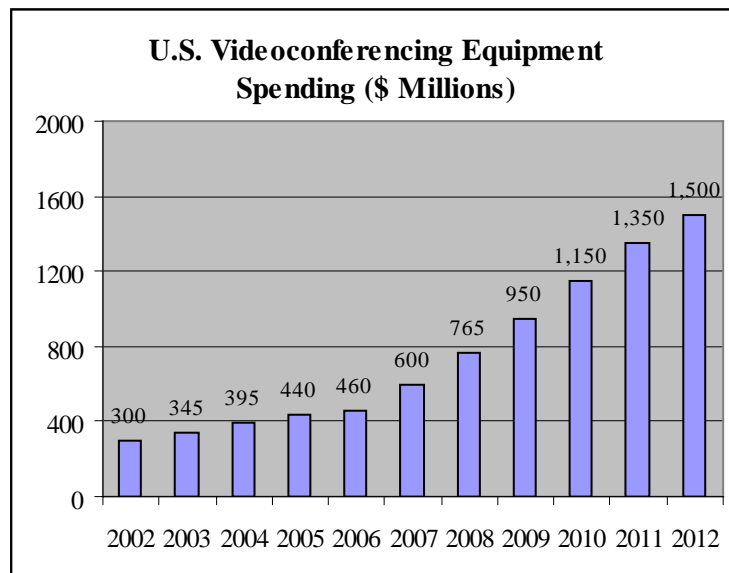
New standards are improving the quality of videoconferencing; standards-based architectures are reducing costs; and systems running on IP networks allow users in multiple locations to participate simultaneously. New systems create virtual environments that capture body language and eye contact that makes videoconferencing a viable substitute for face-to-face meeting. The savings in time that videoconferencing provides may ultimately be valued more than the savings in travel costs. In addition to the travel time itself, time and resources are used to plan

trips, make accommodations, and coordinate schedules. Virtual meetings, by contrast, can occur with little time, which improves overall efficiency.

The desire to “go green” is another factor stimulating demand for videoconferencing. A UK study found that conferencing, both video and audio, accounted for 850,000 virtual meetings—meetings that otherwise would have required some travel. In addition to the cost savings by avoiding that travel, there was a 97,000 ton reduction in carbon dioxide emissions because of the reduction in travel. Companies are increasingly interested in adopting green technologies—both for the cost savings they generate and also for supporting the effort to forestall global warming.

Cisco Systems may have an additional motivation for expanding its presence in videoconferencing. The greater the videoconferencing traffic, the greater the demand for bandwidth. Bandwidth demand, in turn, will stimulate the market for routers, switches, and other gear produced by Cisco.

Looked at simply as a standalone market, the videoconferencing equipment market has taken off in the past few years, more than doubling from \$460 million in 2006 to an estimated \$950 million in 2009. We expect that market to continue to expand at healthy rates, rising to \$1.5 billion by 2012, a 58 percent increase from 2009.



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Mobile Television

One of the most promising applications for generating incremental revenue for the wireless industry is mobile video. VCast from Verizon and MobiTV®, available to Cingular Wireless and Sprint Nextel subscribers, are the primary services. Subscribers to these services spend substantially more per month on all wireless applications than non-subscribers, which makes video an attractive application for wireless carriers.

Video can be distributed over 3G networks, but these networks are inadequate for broadcasting live TV programming to many viewers at once as they were designed for unicasting or delivering content to individual subscribers one at a time. There are a number of competing technologies being developed to deal with this problem. Verizon's new service will deliver live television programming using MediaFLO™, a dedicated video broadcast network developed by QUALCOMM. AT&T is also adopting the MediaFLO system.

IPWireless, a company that makes equipment for the wireless industry, announced in April it had a technology called TDtv, which adapts the Universal Mobile Telecommunications System (UMTS) TD-CDMA technology to transmit signals in multicast rather than unicast, thereby providing enough capacity over existing 3G spectrum to allow mobile carriers to provide live TV programming without the need for a separate network.. Sprint Nextel will likely test the technology as it is financially backing IPWireless.

The nation's broadcasters are also getting into the market for mobile television. Harris Corp. joined with LG Electronics to develop the Mobile-Pedestrian-Handheld (MPH) technology that will enable local broadcasters to deliver their signals to mobile and handheld devices such as TV screens in cars and battery-operated televisions. Earlier in the year, Samsung announced the development of a similar technology called Advanced-Vestigial Sideband (A-VSB) that also allows local broadcasters to send their signals to mobile devices. A-VSB is a modification of 8VSB, which is the 8-level VSB modulation method used for transmissions of the Advanced Television Systems Committee (ATSC) digital television signals. A television industry alliance called the Open Mobile Video Coalition composed of nine U.S. television broadcast groups was created at the National Association of Broadcasters convention in April to speed the implementation of a mobile aspect for digital broadcast TV. In the same vein, the ATSC, a technical standards organization composed of 150 companies that previously helped define the digital TV standards, began the process of defining standards that will enable broadcasters to send their signals to mobile and handheld devices. It is unclear if the technology being developed by the broadcasters will compete with MediaFLO, DVB-H, and TDtv to reach cell phone users.