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Hearing on

“The Government’s Role in Promoting the Future of the
Telecommunications Industry and Broadband Deployment”

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Mr. Chairman and Members of the Committee, my name is Craig Mundie, and I am Senior Vice President and Chief Technical Officer of Advanced Strategies and Policy at Microsoft Corporation. I am glad to be here today because we bring a different perspective than many witnesses the Committee has seen on telecommunications matters.

Microsoft’s Perspective on the Importance of Robust, Reasonably Priced Broadband.

My company approaches this issue as a worldwide leader in developing software, services and Internet technologies, as well as a user of bandwidth. We are not in the telecommunications business, but rather, we, along with many other high-tech companies, are in the business of developing software and services that excite consumers enough so that they actually will pay for “bigger pipes” to run ever-more innovative services and applications. Like others in the tech community, we see robust, reasonably priced broadband services as essential for enabling and encouraging the development of new applications and services that improve worker productivity, enrich personal lives and business operations, and deliver benefits to every sector of society and the economy. From that perspective, we

see the topic before this Committee as important not just for the near term. Getting broadband policy right, here at the onset of the broadband era, will impact our national welfare and global competitiveness long into the 21st century.

Two Straightforward Steps That Will Promote Broadband Deployment.

There is no doubt that the government, consumers and businesses now fully recognize the importance of broadband to our communications capabilities and the economy. As the Federal Communications Commission explained earlier this year, “ubiquitous broadband deployment will bring valuable new services to consumers, stimulate economic activity, improve national productivity, and advance economic opportunity for the American public.”¹ We agree with that view. Indeed, I expect that everyone agrees with that view.

The issue before this Committee, however, is more challenging: How do we get there? Of course, this is not a new question for this Committee or our country, but we must approach this question with renewed urgency, because the United States is losing the footrace for broadband penetration to other countries. To address the current inadequacies in U.S. broadband deployment, Microsoft believes this Committee and other policymakers can take two straightforward steps:

- Foster a third mode of broadband communications into the home by making more spectrum available for exciting, new unlicensed technologies and subject that spectrum to minimalist, efficiency-enhancing rules of the road.

¹ In re the Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities, Universal Service Obligations of Broadband Providers, *Notice of Proposed Rulemaking*, CC Docket No. 02-33, ¶ 3 (2002).

- Preserve consumers' ability to communicate and interact via the Internet with each other, and with new services and applications, without the threat that the underlying network provider will interfere with those relationships.

We understand that several members of the Committee are exploring proposals to address these goals, and we fully support those efforts.

There is Urgency to Act on These Two Fronts.

Our industry generally has not engaged in the telecom battles of the past because we develop software and applications that ride on the pipes that other industries supply. But we are watching with great concern because the current course is not aimed at achieving the broadband future we want as rapidly as possible, and we commend Chairman Hollings and other members of this Committee for exploring new paths to a broadband future. The need for action is great because not only are we losing ground in the worldwide race to become leaders in deployment of broadband, the consequences also are being felt from our perspective in the invention of new broadband applications and services. If analyzed closely, current statistics are not encouraging. According to a recent Commerce Department study, our country has the most households of any nation connected to a broadband service (over 11 million). However, as a percentage, our penetration rate is sixth in the world, behind the likes of Sweden, South Korea and Taiwan among others. And recent trends lines indicate that we are falling further behind, not catching up.

The gravity of the situation is even starker when one realizes that the rules or laws being

contemplated today will shape a future version of the Internet – a future which is much closer than many of us realize. A debate that simply focuses on how to download information faster from a Web site is somewhat akin to a debate at Western Union in 1902 as to how to move Morse Code faster across the country. We are rapidly moving from today's world in which the vast majority of activities focus on publishing of content (be it Web pages or entertainment) and person to person communications (such as e-mail and instant messaging), to a different world, one which preoccupies the tech community and motivates all of us to innovate: a world in which literally millions upon millions of computing devices will be simultaneously and constantly connected to the Internet, and on consumers' behalf, will communicate with each other.

This is not futuristic in the least. Personal digital assistants, smart appliances and computer-drive set-top boxes are just a few examples of the types of devices that will need affordable access to “always on” high speed connections in order to automatically bring new services and capabilities into the home. Wouldn't it be convenient to monitor who is knocking at the front door of your home from the computer at your office? Or while away for the weekend, license via your PDA the right to view the latest episode of the Sopranos, then have it delivered to your home entertainment system to be viewed when you get home from your trip? The Internet is in transition. It is becoming much more than publishing. It is becoming a programmable environment in which computers, devices and services will need the ability to constantly stay in touch, and the ability to do so in a seamless, unfettered way.

To take full advantage of the programmable nature of the Internet, consumers will need affordable, reliable and fast connections. Some advocate that, with some rule changes, telephone

companies will have greater incentives to deploy advanced services over their copper and fiber facilities.

The argument is that without greater regulatory parity between telephone companies and cable operators the former cannot compete as effectively with the latter. We have a good degree of sympathy with these arguments and have been working with others in the tech community to promote greater parity here on the Hill and at the FCC.

Others have argued that the key to stimulating broadband deployment is to ensure that high-value content is available online. I know this Committee has addressed that question in other hearings, and that it is not the topic of this hearing. I want to assure the Committee that Microsoft is doing all it can to develop its own compelling content, services and applications for the broadband era, and we continue to work with other content producers to give them the tools they need to develop their own broadband offerings.

At the end, however, we submit that these ongoing efforts are not enough. Policymakers can and should do more. They should more aggressively manage the nation's radio spectrum – and in particular, unlicensed spectrum – in order to give unlicensed wireless broadband services an opportunity to meet the demand that is simmering for these new technologies. And equally important, to assure the programmable Internet that is rapidly approaching is not derailed, policymakers should reaffirm that network providers should abide by certain, basic “connectivity principles.”

Wireless Broadband Connections Provide a Third Way for Consumers.

Although much of the current debate over broadband services has focused on two platforms,

cable and DSL, that perspective fails to consider that other technologies are available – other technologies that can jump-start consumer-driven investment in broadband services, provided policymakers aggressively manage the regulatory environment to foster that outcome. Specifically, I am referring to potential advances in the wireless sector, and even more specifically, advances in the development of unlicensed radio-based networks. These systems are currently referred to as 802.11b, radio LANs, or Wi-Fi. More generically, they might be referred to as “emerging radio technologies.” These technologies – and even more futuristic ones such as Ultra Wide Band and Software Defined Radios – not only offer an additional means of delivering packets at high speed, they also allow new business models for delivering broadband connectivity to emerge. These are not your “same old” radio services. Because they can be deployed in an unlicensed manner, the broadband connections can be deployed by the consumer herself – using her purchasing power and interest to meet her personal demand for a broadband connection.

If this Committee and policymakers at the FCC and indeed around the world make more spectrum available for these devices and, simultaneously, adopt minimalist spectrum rules or “etiquettes” that limit the devices’ ability to engage in mutually destructive behavior (i.e., by interfering with each other), the result will be more choice for consumers and stimulated innovation in broadband services overall.

These emerging, unlicensed technologies can support the transmission of data at high speeds for a low cost. That value proposition – higher speeds with relatively cheap and fast deployment – is especially compelling in rural areas where distance is so frequently the enemy of network efficiencies

and a major cost driver for broadband deployment, as well as in inner-city areas where the high cost of broadband is a significant inhibitor to deployment. With unlicensed technology and the appropriate wireless rules, Internet access and other types of community communications could be provided at comparatively lower costs. This promise is more than theoretical. In Iowa, one company, Prairie iNet, is using wireless technology attached to the side of grain silos to operate as a wireless ISP in 150 communities in the Midwest, with 5000 sites. Three fourths of their customers are residential. Today, Wi-Fi technology is deployed at lower costs where there is demand to provide consumers with more convenient wireless Internet access in places away from home and office, such as coffee shops, airports, and hotels. These “hot spots” can provide speeds of 11 mbps, which is more than 10 times what 3G providers have promised, and 150 to 200 times faster than dial-up service. For those who have even greater bandwidth needs, a second generation of Wi-Fi has the capability to reach speeds of up to 54 mbps. Notably, these connections can be “always on,” assuring a pathway for the type of programmable services I described above.

What is even more compelling is that consumers who want this degree of connectivity can buy unlicensed equipment at a consumer electronics store, just as they buy a cordless telephone today, and then take it home to install it. An astonishing array of advanced communications equipment is now being developed, sold, and used to provide wireless broadband access in the unlicensed bands. These bands provide tremendous flexibility and are the opposite of the FCC’s traditional approach to spectrum regulation, which reflects centralization of control and specification of use. The current challenge is to provide adequate spectrum and the minimalist rules to allow this spectrum to be used for truly

dependable communications by consumers. Current unlicensed approaches fail in both dimensions, creating a situation where the more successful the development and deployment of systems the more congested the environment becomes, frustrating attempts to make this a sustainable alternative to traditional broadband services.

Congress and the FCC can do more to encourage alternative wireless broadband connections using unlicensed spectrum. Today, there is insufficient unlicensed spectrum and, where it is being used for unlicensed networks, the nation's regulations foster a tragedy of the commons. Use of the spectrum is so lightly regulated that, to assure their own success, radio manufacturers may have an incentive to maximize their use of spectrum to others' detriment and, over the long haul, likely to their own. Within some groups of manufacturers, there are incentives to cooperate (such is the case with manufacturers of today's Wi-Fi systems). However, without a modest degree of greater regulation, it is difficult to assure cooperation across different manufacturing interests.

Unlicensed spectrum bands, if upgraded modestly and in a targeted way, are uniquely well suited for the creation of broadband infrastructure for a variety of reasons. They are easily accessed by everyone, from the largest corporations to the smallest entrepreneurs to individual consumers. Indeed, the 2.4 GHz band, which supports everything from cordless telephones to radio-based LANs, reflects a significant level of innovation from entrepreneurs attracted by the band's easy availability and lack of individual licensing requirements. It will not surprise the Committee when I say that the market moves a bit faster than the FCC's licensing bureaus, however well-run.

Moreover, because unlicensed bands are open to anyone who buys a compliant device at a

retail store and attaches it to the network, a significant proportion of the capital invested in the creation of networks comes from individuals and businesses, not from network operators. Wireless networks are truly built from the ground up, tapping an entirely new source of capital to build networks – the financial resources of the users themselves. This is remarkable for two reasons. One, there is no “build it and they will come” mentality, with its legacy of overinvestment and stranded capital. Instead, the wireless networks will grow organically, fed by new demand and marginal supply. Two, while this alternative source of capital would be important at any time, it is critical now, when even the most successful carriers have difficulty navigating capital markets.

Finally, unlicensed spectrum is open to and can support a multiplicity of technical solutions and contributes to redundancy, since future unlicensed wireless networks may be dramatically different from existing networks.

Over the last few years, the FCC, recognizing the potential benefits of new technologies and creative uses of spectrum, has been increasingly willing (with some helpful prodding by this Committee) to grant individual licensees greater flexibility in how they use their spectrum. This trend toward relaxing use specifications on individually licensed bands is an important and worthwhile innovation in spectrum management. It is in the same spirit of innovation that Congress should encourage the Commission to adopt more deliberate regulation of some unlicensed bands. No single approach to spectrum regulation is perfect, and unlicensed bands are no exception. While current rules for unlicensed blocks of spectrum have been enormously successful and have brought numerous benefits to the public, they have also permitted less than optimal use of available frequencies. Inevitably, where there are virtually no

rules of the road and almost anything is possible, someone will design a technology that causes harmful interference to other technologies. Sometimes this is because there is no technologically feasible alternative. And sometimes it is simply cheaper to shout noisily than to speak in measured tones. Unfortunately, a spectrum free-for-all is not only messy, it carries a cost: innovative companies will steer away from developing competitive unlicensed broadband networks unless rules of “spectrum etiquette” have been developed and implemented.

For this reason, it would be helpful for Congress to prompt the FCC, as we have, to foster the creation of more “unlicensed broadband spectrum” specifically for use by emerging technologies, such as Wi-Fi, UltraWide Band and Software Defined Radios, and new business models, such as community wireless data networks, that could supplement cable modem and DSL services. This is *not* a request for more spectrum for cellular or PCS or some generation of 3G. Instead, it embraces a flexible model that is driven by consumer demand and innovation and not the deployment schedules of cash-strapped carriers. Immediate steps by the FCC to allocate unlicensed broadband spectrum and adopt minimum regulations could accelerate the creation of wireless broadband services across the United States, making service available more quickly in unserved and underserved areas and stimulating rivalry with cable modem and DSL services. We strongly support proposals to address this important spectrum policy.

Consumer Freedom from Network Operator Interference Is Equally Important.

Broadband connections accomplish little, however, if consumers are deprived of the ability they enjoy now in the dial-up and corporate network environments to roam freely over the Internet; to run the applications they want using the equipment they choose; to gather, create, and share information; and to connect to Web sites with no interference. Long before the creation of the Internet, policymakers around the globe recognized that freedom from interference by network operators was critical to consumer trust, as well as fostering gains in productivity and economic activity. The history of the Internet itself has been fundamentally characterized by unfettered consumer ability to use an unprecedented array of content, services, and applications via an ever-increasing array of products.

We are troubled, however, that in the ongoing debate on what our nation's broadband policy should be, this fundamental lesson may have been lost. Proposals pending before the FCC would remove long-standing obligations of network operators not to interfere and not to discriminate, obligations which go back at least to the famous *Carterfone* decision and some of which go back to 1934. Watching the debate from afar, it appears that the freedom to connect to where one wants – the ultimate hallmark of the Internet – may be left behind. That would be a mistake, because the Internet and the economy have been well served by the unfettered ability of consumers to communicate and interact with each other.

This concept of promoting free interaction among people is embodied in our policy of universal telephone service – one of the singular successes of American communications policy. Universal telephone service is good social policy and good economic policy. Economists refer to the benefits of adding more people to a network as Metcalf's Law. The principle is that by adding more users to the

communications network, the economic value of the network increases for every user exponentially.

But if network operators interfere with this interaction, or erect tolls on broadband highways that drive consumers in one direction or another, then they will be affirmatively undermining Metcalf's Law. Those actions, if tolerated by policymakers, will frustrate our collective goal of adding more users, device types, and services to the network, benefiting not only new users, but the users who are already there.

One cannot ignore the ominous signs that network operators will frustrate consumers' ability to go anywhere on the Internet. As a major user of broadband services, we think it would be a mistake for policymakers not to address these concerns.

Already, cable operators have adopted provisions that impair the ability of consumers to use their broadband connections. These issues have been documented to the FCC by a coalition of trade associations, the so-called High Tech Broadband Coalition. In one instance, a subscriber agreement says:

"You agree to only connect [company] approved equipment to the [company's] network. . . .

You will not connect the [company's equipment] to any outlet other than the outlet to which the Equipment was initially connected by the [company] installer. [Company] may relocate the Equipment for you within the Premises at the your [sic] request for an additional charge. . . .

You understand that failure to comply with this restriction may cause damage to the [company] network and subject you to liability for damages and/or criminal prosecution."²

In response to these kinds of restrictions, the HTBC has developed four connectivity principles that

² Full text of the agreement can be provided to the Committee. We have made the citation generic in order to illustrate our point without singling out a particular company.

should be respected in the broadband era. And as a company, we have urged the FCC to apply them to both DSL and cable modem providers. Specifically:

- Consumers should have unrestricted access to their choice of lawful Internet content using the bandwidth capacity of their service plan.
- Consumers should be allowed to run applications of their choice and to attach any device they choose, as long as they do not harm the provider's network, enable theft of service or exceed bandwidth limitations of their service plan.
- Consumers should be given meaningful information regarding the technical limitations of their service.

Let me be clear that we are not advocating "forced" or "open" access. In our view, network operators need not be compelled to create a wholesale offering of a "bit transport service" so that third-party Internet service providers can compete with the facility owner on the same wire. Nor do we suggest that DSL and cable modem providers should be limited in how they offer their own service and bundle it with other services. At their core, the connectivity principles articulate nothing more than a noninterference rule.

These restrictions in existing contracts that interfere with consumer interests are troubling, and the Committee should review the complete record on these provisions that the high-tech industry submitted to the FCC. Unfortunately, the response by some at the Commission so far has been more of a yawn than of concern, as if those issues are out of fashion. Speaking on behalf of one company which thinks every day about how to use broadband capability to deliver better software and services to

consumers, we disagree. As users of the Internet and builders of the Internet age, we believe that our success and consumers' enjoyment of the Internet has grown out of one fundamental feature – the ability of consumers to use their internet connections without interference from network providers. This freedom has made the Internet the powerful communications and technology tool that it is today, stimulating small business development and benefiting the entire economy.

Freedom from interference from network operators has fostered tremendous gains in productivity and economic activity over the past decade. As this Committee and the FCC develop policies for next generation networks, now is not the time to abandon this fundamental feature. The lessons from the 20th century with respect to promoting consumer access to networks are as valid as ever. They will become all the more important as the Internet and the growth of Internet-based data services continue to blur the distinction among facilities-based broadband services, and as the high-tech community continues to develop smart devices and smart applications that can be attached to and run over those facilities. It is time to reaffirm that a basic noninterference rule – an essential element of today's dial-up Internet world – must be carried forward into the 21st century.

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We commend Chairman Hollings and this Committee for focusing attention on these issues. Clearly, as our nation develops a broadband policy, we urge aggressive congressional attention on how to promote rapid, efficient, Nation-wide, and consumer-friendly broadband deployment.