

Before the  
DEPARTMENT OF COMMERCE

National Telecommunications and Information Administration  
National Institute of Standards and Technology

In the Matter of )  
 )  
Request for Comments on ) Docket No. 040107006-4006-01  
Deployment of Internet Protocol, Version 6 )

COMMENTS OF QWEST COMMUNICATIONS INTERNATIONAL INC.

Qwest Communications International Inc. (“Qwest”) hereby files these comments on the Request for Comments on Deployment of Internet Protocol, Version 6, issued January 21, 2004 by the National Telecommunications and Information Administration (“NTIA”) and the National Institute of Standards and Technology (“NIST”) of the Department of Commerce.

The Request for Comments seeks a wide range of information on the industry’s efforts to develop and implement Version 6 of the Internet Protocol (“IPv6”). Qwest is of the opinion that development of IPv6 is a vital task in support of the continuing development of the United States’ telecommunications infrastructure. In this regard, Qwest submits that maximum reliance on the private sector to spearhead these developments is the optimal manner in which IPv6 can develop. Qwest participates in the various industry forums studying IPv6, and is happy to share its insights with the NTIA and NIST. Qwest’s participation in this formal docket will, however, be limited to addressing several issues pertinent to the participation by the Government in the process of developing IPv6. For the most part, Qwest submits that the Government’s position should be primarily that of an intensely interested consumer of Internet products, and that its

participation in the development of IPv6 should be limited to the exercise of its commercial, rather than its governmental, authority.

We briefly address the following questions from the Notice.

1. *We seek comment on whether market forces alone will be sufficient to drive a reasonable and timely level of IPv6 deployment in the United States.*

The natural working of market forces will be most likely to result in the most efficient and effective deployment of IPv6 in the United States. Qwest (and other network service providers) develop and deploy network services based on customer demand. Historically, deployment of new technologies within service provider networks has been driven largely and most effectively by evolving customer requirements without Government intervention or rules. The most recent example of this principle is in the development of IP VPN (virtual private network) services. As customer demand has increased for more secure and efficient private communications using Internet technology, technologies such as MPLS (multi-protocol label switching) and Internet Protocol Security Architecture (“Ipsec”) have been deployed to meet that demand, and other products have been developed (within the Qwest networks and others) to support MPLS and IPsec technologies. This same trend will occur for IPv6-based services. When there is sufficient customer demand for applications based on IPv6, service providers will respond with widespread deployment of products based on this new technology as well.

2. *We seek comment on whether such a “chicken and egg” relationship exists between IPv6 applications and supporting infrastructure, and if so, how that relationship is manifesting itself in the market for IPv6 products and services.*

A “chicken and egg” problem (whether demand will follow deployment or visa versa) does not exist with IPv6. Instead, consistent with a market-driven approach, customer demand already exists for global Internet and VPN connectivity, and this demand (plus additional

demand as market forces continue to operate) will drive IPv6 deployment within the United States. Several key factors will continue to drive this trend.

The most compelling benefit associated with the deployment of IPv6 today is the expansion of available IP address space. Although most well established North American Internet Service Providers have already been allocated sufficient blocks of IPv4 address space, many emerging Internet providers in other parts of the world have not. In these areas, emerging providers who are not able to procure sufficient IPv4 address blocks will deploy IPv6 as an alternative. This market factor alone will continue to drive deployment of IPv6 on a global basis -- including within the United States.

In addition, a growing number of large enterprises today are commonly based internationally with worldwide offices. Requirements for global connectivity are common within these enterprises and within the Internet community generally.

The combination of these two factors demonstrates both that global business providers demand IPv6 connectivity, and that effective providers of global network services (including U.S. service providers, many of whom are currently based on IPv4) will need to provide support for IPv6 connectivity in regions of the world where IPv6 has been deployed already. Of course, this type of global connectivity may be deployed initially via some type of IPv4 to IPv6 inter-working, or via a native deployment of IPv6. In the end, however, the demand for global connectivity will drive support for IPv6 by United States service providers.

Internet customers, in other words, have a pressing market need (and market demand) for deployment of IPv6, which demand creates the market incentive for suppliers to respond creatively to this customer demand with product deployment and development. The “chicken and egg” phenomenon simply does not exist in the area of IPv6 deployment.

3. *We therefore seek comment on whether any firm or firms have monopoly power for IPv6 products and services, and how the exercise of such monopoly power will affect IPv6 deployment in the United States.*

It is extremely unlikely that any single service provider would have monopoly power for IPv6 products and services. Support for IPv6 is widespread in most hardware platforms deployed in service provider networks (including Qwest's network) today, and the standards are available and continue to evolve in the public domain. When customer demand for IPv6 services becomes significant, any of the major IP service providers in operation should be able to compete in the IPv6 services market. Address space itself is so large that the possibility that a single entity could exercise monopoly control through control of address space is extremely unlikely -- certainly not sufficiently imminent as to cause governmental concern at this stage.

4. *The task force also seeks comment on whether the private sector may fail to sufficiently implement IPsec or other security mechanisms, and whether government action to accelerate the deployment of IPv6 could aid private sector security efforts.*

The market demand for security of transmissions is such that security is not realistically treated as a "public good" that might not be deployed if market forces were the sole factor driving development. Security is a high priority requirement for current customers and service providers alike, and there is no indication that it will not remain so. Customer demand for IPv4 VPN services with IPsec encryption is already widespread in the marketplace. Security requirements vary across markets, depending on the sensitivity of application traffic that is transported across a particular network. Government involvement with specific technologies such as IPv6 will not change customer requirements for privacy and encryption features associated with network services. Of course, the Government as a consumer of Internet services will necessarily be a major player in the development of security systems (because the Government will demand products that meet its own security needs) within IPv6, but this role is

completely consistent with the reasonable reliance on market forces that Qwest submits should properly drive IPv6 security deployment.<sup>1</sup>

5. *If the federal government should elect to spur deployment of IPv6 within the U.S. economy, we also request comments regarding how, when and in what form such action should take.*

As noted above, the “government as consumer” option is the only truly viable option for governmental support of the development and deployment of IPv6. Given the dynamics of the development of the Internet in general, and IPv6 in particular, Qwest submits that any other governmental role is both unnecessary and likely to be counterproductive. However, the Government’s consumer role should not be understated. The United States Government is one of the world’s largest consumers of telecommunications services. When the Government views IPv6 products and services from the perspective of what it wants and needs as a consumer, rather than what it prefers to see as a regulator and governing body, the resulting decisions will dramatically shape the development of IPv6. This is how markets are supposed to work, where customer need and demands drive the most efficient and creative development and deployment of products and services. We submit, of course, that the Government’s consumer role should be in fact based on its needs as a consumer (as opposed to regulation through consumer choices that

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<sup>1</sup> For additional perspective from the telecommunications industry on IPv6 security *see* The Network Reliability and Interoperability Council (NRIC), Subcommittee 1.B, Cyber Security, Homeland Defense - Recommendations at p.15-16 (NRIC Signaling Findings on IPv6 Transition), March 14, 2003, [http://www.nric.org/fg/charter\\_vi/fg1/FG1B\\_front\\_matter\\_and\\_proposals\\_FINAL\\_3-13-03.doc](http://www.nric.org/fg/charter_vi/fg1/FG1B_front_matter_and_proposals_FINAL_3-13-03.doc).

are not based on actual needs). But on balance the Government can accomplish much more that is truly beneficial in the development of IPv6 if it wears only its commercial, as opposed to its governmental, hat in addressing IPv6 issues.

Respectfully submitted,

QWEST COMMUNICATIONS  
INTERNATIONAL INC.

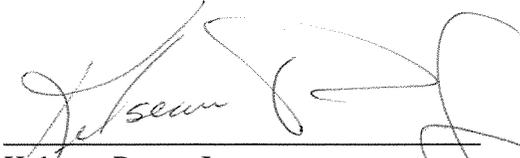
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March 8, 2004

CERTIFICATE OF SERVICE

I, Kelseau Powe, Jr., do hereby certify that on March, 8, 2004, I have caused an original and five copies of the foregoing **COMMENTS OF QWEST COMMUNICATIONS INTERNATIONAL INC.** to be hand-served on the Office of Policy Analysis and Development, National Telecommunications and Information Administration, Room 4725, Attention: Internet Protocol, Version 6 Proceeding, 1401 Constitution Avenue, N.W., Washington, DC 20230. In addition, an electronic copy in Microsoft Word, Version 5.1, is being submitted via electronic mail to the following address: IPv6@ntia.doc.gov.

  
Kelseau Powe, Jr.