Written Testimony of Craig Shank

General Manager, Interoperability Group

Microsoft Corporation

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Chairman Wu, Ranking Member Smith, and Members of the Subcommittee, my name is Craig Shank and I am the General Manager of the Interoperability Group at Microsoft. In this capacity, I have executive responsibility for Microsoft's corporate standards activity on a global basis. Microsoft believes strongly that the best standards emerge from voluntary processes and public-private partnerships that allow for dynamic, market-led innovation.

As a global innovator with over two decades of experience in the development and implementation of technical standards, Microsoft appreciates the opportunity to participate in this important hearing on the structure of the National Institute for Standards and Technology (NIST) and its future role in technical standardization.

At their most fundamental, technical standards are tools that promote efficiency and innovation by making it easier to create products and services that work together – or

"interoperate" – better. This is equally true in the information and communications technology ("ICT") environment. With an increasingly diverse and competitive ICT marketplace, and new ICT solutions, services and vendors appearing in the market almost daily, interoperability has become a market imperative. The development and implementation of standards is one of the ways in which the technology industry is able to meet consumer demand for interoperability.[1]

By helping to enhance interoperability among products or services within a market, and being responsive to real marketplace needs, standards can help promote innovation, fuel market growth, and protect investments in new technologies. The ICT marketplace changes rapidly. As a result, ICT standards must be able to change in response. New standards must be permitted to compete in order to respond to these needs, further additional competition, and encourage the development of innovative solutions.[2]

Microsoft plays a dual role in standardization activities. First, we actively contribute innovative technology to standardization related to computing hardware, software and associated devices, the Internet and its infrastructure, consumer electronics devices, and telecommunications systems. Second, we are an active implementer of standards. Microsoft supports a very large number of standards in our products that are formulated by a broad diversity of standards bodies. Ultimately, both of these roles are deeply informed by the market, and in particular feedback on the way customers use ICT products and services in their day-to-day lives.

Because of this dual role as contributor and implementer, Microsoft takes a balanced approach to standards development and policy. We understand the particular needs and concerns of those contributing time, resources and technologies to the development of standards, but we are equally sensitive to the needs of those who are implementing the

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[1] Microsoft's commitment to standardization to help further interoperability is reflected in our Interoperability Principles, available at http://www.microsoft.com/interop/principles/default.mspx Additional information about Microsoft's standards policies and activities can be found at: http://www.microsoft.com/standards/.

[2] Given the dynamic nature of innovation and ICT standards development, government should be cautious about mandating adherence to any particular standard without demonstrating sufficient need and without support from the impacted industry and relevant stakeholders. Mandated standards can divert normal marketplace outcomes, lock the industry into a less-than-optimal solution, and reduce incentives to innovate in that technology area.

resulting standards into their products and services. Our involvement on both sides of the standards fence frames our perspective that a diverse standards ecosystem that supports multiple technologies is good for the U.S. and global economies.

The computing experience itself is undergoing a powerful transformation that demonstrates the velocity of change in the ICT marketplace and related technical standards. Increasingly consumers and businesses alike are harnessing computing power in the cloud. People are running applications and storing documents on powerful servers located in massive data centers. They are using more powerful client devices. And they are creating, accessing, and sharing more of their personal information more frequently and with more people than ever before. This new frontier opens up a whole new horizon of possibilities, including new software investments that will create new business models and opportunities to form and grow new businesses. For instance, these technologies already enable any small group of creators to develop content or software and to have it available instantaneously in the marketplace around the globe. And with this new opportunity comes corresponding new responsibility. This includes the need to protect the privacy of users and security of their data and to enable interoperability between systems – all areas where standards may play an important role.

Cloud computing is a technology area with broad applicability for the U.S. Government, not only to increase efficiency and reduce cost, but also for communication between agencies and as a continuation of efforts to increase citizen participation. As such, cloud technology represents an ideal opportunity for beneficial participation by NIST. Indeed NIST has already made an important contribution to the advancement of cloud standards, essentially providing the engineering taxonomies that help the industry discuss the various aspects of cloud technology and deployment. NIST is a key player in the standards ecosystem, and its expertise and involvement is highly valued by the private sector.[3]

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[3] Among other contributions, NIST's measurement standards underpin many key technology standards, including those relating to optical fibers and to a range of electronic devices. NIST also provides key standards-related services, including the "Notify US" program, and participates in various standards development organizations (SDOs). Equally important is NIST's role under the National Transfer and Technology Advancement Act ("NTTAA") and OMB Circular A-119 to help coordinate U.S. Government's interests in coordinating U.S. Government interests in standards and conformity assessment systems.

Questions Posed by the Committee

In connection with today's hearing, the Committee has posed three inter-related questions regarding NIST:

- **Why is coordination amongst Federal agencies and departments on technical standards issues important? How can it be improved?**

    The current Administration has identified a number of technology policy areas of focus (such as smart grid, healthcare IT and cybersecurity) where there is a need to understand what positive role standards can play. We believe that NIST can undertake a convener role, and thereby promote collaboration among both public and private sector stakeholders aimed at developing an appropriate standards framework to address U.S. Government objectives. This is important in connection with certain technology policy objectives where the standards-related needs involve several standards elements and cut across many different technologies and stakeholder groups.

    From an industry perspective, in this context we value effective problem definition, particularly through scenarios and use cases. We believe NIST is uniquely positioned to help bridge the gap between complex U.S. Government objectives and the voluntary consensus-based standards system by taking a proactive role in convening a wide breadth of key stakeholders tasked with undertaking that problem definition work.

- **What could a future NIST role in standards be? How can NIST foster federal agency collaboration on international technical standards issues?**

    NIST can also serve in a separate convener role whereby it could facilitate the exchange of information and collaboration among Federal agencies on domestic and international standards policy issues and on Federal agency engagement in international technical standards development activities as appropriate. Typically, these types of standards issues are of interest to more than one agency, and it would be helpful for the U.S. Government to articulate a unified position or be mindful of differing viewpoints, especially when engaging in international standards bodies.

    Further, the President's National Cyberspace Policy Review released in May 2009 (see http://www.whitehouse.gov/assets/documents/Cyberspace_Policy_Review_final.pdf), stated that "the sheer number, variety, and differing focuses of these venues strain the

capacity of many governments, including the United States, to engage adequately." The President also articulated the need "to enhance the identification, tracking, and prioritization of international venues, negotiations, and discussions where cybersecurity-related agreements, standards, activities, and policies are being developed." NIST is uniquely positioned to play a central role in facilitating coordination among the Federal agencies on international technical standards issues.

- **Please share any perspectives on the proposed NIST alignment.**

NIST appears to have taken a very thoughtful approach to its re-organization that, among other things:

- Seeks to ensure that the development of standards-related strategies for a given technology is done in close collaboration with the NIST staff and other stakeholders with the appropriate subject matter expertise relating to the technology area at issue.

- Seeks to capture and address the different perspectives of all internal stakeholders when developing and refining positions or approaches.

- Establishes what is likely to be a more effective executive management structure.

We would like to elaborate further on these responses below.

Discussion

We believe that the U.S. Government should leverage NIST's expertise on standards, the standardization ecosystem and technology issues, as well as its well-deserved reputation as a neutral, science-based organization that serves as an "honest broker", in helping to enable further coordination among Federal agencies on issues relating to technical standards.

This coordination is becoming increasingly important. While the Federal agencies have all been assessing the use of private sector standards (and participating in their development) whenever possible under the NTTAA, many of these agencies are now considering standards to address broader technology policy initiatives that cut across agency

missions and responsibilities.[4] In addition, to the extent that standards-related policy or technical issues arise that may have both national and international implications impacting competition, trade and innovation, Federal agencies should seek to share information and collaborate to the extent possible on developing a unified U.S. Government position.

We believe that this approach will support the U.S. Government in accomplishing its objectives. U.S. competitiveness is best served in an environment where private and public stakeholders from around the world can work to develop standards that meet the needs of the global marketplace and foster global competition that in turn fuels further innovation and new market development.

As a convener seeking to develop a standards framework to support a U.S. Government technology objective, NIST should:

- Define the problem. Questions that must be answered include: What is the specific policy goal to be addressed? What is the range of technologies that support this goal? What standards already exist? How effective are existing standards at solving the problem at hand? Accurately framing the answers to these and other questions is essential for several reasons. It helps to identify the full range of stakeholders who will be relevant to the standardization effort; to establish the parameters necessary for any effort involving different industry players (particularly players with divergent agendas); and to ensure that the outcome of the standardization effort is focused, pragmatic, and is likely to be endorsed by key stakeholders.

- Identify and bring together relevant stakeholders. Effective standardization framing requires input from multiple stakeholders from the very beginning, particularly in complex standards areas. Absent broad participation and open consultation, there is the risk that some interests, including government agencies and smaller companies who have invested heavily in their own innovative

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[4] If NIST is tasked with these roles, one of the key challenges it will face will be to determine the factors that should trigger the initiation of a "NIST-coordinated" standards planning process. These processes can consume large amounts of public and private sector resources, and they may not always be the best response to a given technology policy challenge – so NIST will want to initiate them strategically.

products and systems, will be shut out of the relevant market or otherwise disadvantaged.

- Report progress to stakeholders and to other interested or affected U.S. agencies.

In our experience focusing on interoperability, effective multi-party engagement requires high-quality problem definition. For us, the key element of this is a plain-language description of how a technology or system might be used (sometimes called the "scenario", or "use case") that needs to be defined for a given standard or specification. Fundamentally, these scenarios are the foundation for efficient, effective specification development and engineering work across multiple parties. They tend to create a solid set of objectives that different players – even players with somewhat differing agendas – can work well with, creating solid, pragmatic results. Both of these elements, in addition to a very effective public-private partnership, have been a core part of the Smart Grid effort at NIST, and we believe they are reflected in the positive response to the NIST Framework and Roadmap for Smart Grid Interoperability Standards.

We also see the need and value of NIST holding a convener role with regard to U.S. Government interests in connection with national and international standards-related technology and policy issues. Stating the obvious, the ICT sector is becoming increasingly global. This trend will only be heightened as we move toward next-generation computing and communications technologies, which are often built to transcend national boundaries. In a convener role, NIST could help facilitate information exchange and seek to coordinate U.S. positions on standards-related issues across the Federal Government as appropriate.[5]

Finally, with regard to NIST's proposed re-organization, it appears that NIST will place standards professionals within each of its labs, enabling NIST to better coordinate the needs of the lab and the needs of standards body participants in the relevant technology areas. We also understand that NIST will create a coordination team to facilitate cooperation between the standards professionals in each of the labs; this should help to ensure that the efforts of one lab do not inadvertently disadvantage the interests or objectives of other labs.

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[5] We recognize that each Federal agency has its own mission and responsibilities, and we are not suggesting that NIST take on the role of a mediator, arbiter or final decision maker on these types of issues. In addition, we also see the need for the private sector to be able to communicate directly on relevant issues with individual agencies and to provide subject matter expertise.

We believe that the proposed reorganization will enhance NIST's overall effectiveness in meeting its mission and objectives.

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In closing, I would like to thank you again for giving us the opportunity to testify today. As I hope my testimony has demonstrated, Microsoft believes strongly that the best standards emerge from voluntary processes and public-private partnerships that allow for dynamic, market-led innovation. We appreciate NIST's valuable contributions to standardization and we support NIST undertaking a more defined convener role to further enable Federal agency coordination on issues relating to technical standards. We look forward to working with you and the broader standards community to preserve and promote a vibrant, collaborative and effective standards ecosystem.