D.   Enhancing the Utility of the usTLD

The phased introduction of new applications and innovations in a responsible manner to further the enhancement and utilization of the usTLD will be a core function of NeuStar's administration of the space.

Introduction

NeuStar has actively followed the domain name space for over three years—both the generic TLDs and the usTLD. Our involvement in the Internet community and active participation at ICANN, IETF, and other standards-making bodies provide the requisite understanding of Industry needs in the near and long-term. Subsequently, our Internet Registry architecture was shaped by the Industry desire to have a highly reliable, secure, scalable, open-protocol platform that will allow for the seamless introduction of enhancements.

NeuStar will leverage the following technical advancements and business commitments to enable a variety of enhanced services.

NeuStar will dedicate resources to enable the numerous applications that the U.S. public and private sectors can utilize through a responsibly managed addressing scheme within the usTLD. The new service enablers would be optional and made available for use both in the new expanded space and the existing hierarchical space. We present below a brief summary of enhanced applications that could be enabled by integrating the combined strengths of a U.S.-centric addressing space and NeuStar's next-generation thick registry platform. NeuStar has gauged market demand and has actively been developing the ability of its thick registry to uniquely enable these application areas.   To this end, NeuStar also proposes a fair and responsible process for enabling these enhanced services while maintaining the integrity of the usTLD.

Enabling Enhanced Services

Thick Registry—NeuStar's industry-leading, next-generation thick-registry architecture provides the flexibility required to introduce innovative private and public services that meet the needs of the U.S. Internet community. An extensible "thick" structure means that an unlimited number of fields of information can be maintained in the registry database in order to enhance utility and facilitate the delivery of enhanced services. These extensible information fields are a key enabler for the delivery of opt-in services to end users by registrars, resellers, delegees, and service providers.

High Reliability—NeuStar has a proven record of managing mission-critical public resources. NeuStar has developed highly reliable infrastructure that is well suited to the consistent delivery of enhanced services within the usTLD.

Highly Secure—NeuStar's experience in securing mission-critical infrastructure, such as the Local Number Portability database, is reflected in the registry platform. NeuStar will implement a trust infrastructure, comprising both security technology and business processes, to ensure the integrity, accuracy, and privacy of the data in the registry. These attributes are critical for the delivery of enhanced services.

HIGHLIGHTS

- **NeuStar's Internet Registry is uniquely developed with the ability to enable enhanced utility and services**

- **NeuStar Service Levels meet and exceed those required to manage usTLD public resource enhancements**

- **Use of standards-based protocols furthers the potential for developers to create new applications**

Open Standards—NeuStar's registry infrastructure makes use of approved open protocol standards. This approach is optimal in terms of the ability of registrars, resellers, and delegees to interface with the registry and also facilitates the development of new services. A standards-based approach will maximize the number of sales channels guaranteeing greater public awareness, access to the usTLD domain, and development of innovative services.

Marketing Investment—NeuStar has the financial resources and is committed to making the necessary investment in marketing and promotional activities to ensure widespread awareness of enhanced service enablers. This approach will tap into the entrepreneurial energy and public-service spirit of the American people and will lead to innovative services that are responsive to the needs of the U.S. community.

Neutrality—Consistent with NeuStar's trusted neutral third party status and Code of Conduct (See Section B.3 for details), NeuStar will make all of the enhanced service enablers available on an equal and fair basis to all members of the U.S. Internet community.

NeuStar has been validating the potential utility of these service enablers from a technical and market perspective. These "enablers" are intended to facilitate applications that are provided to businesses, organizations, and citizens via registrars, resellers, delegees, and service providers. We will provide an overview of the following Enhanced Services for which there is market demand and that our Internet Registry can uniquely enable.

- Public Resource Domains

- e-Government

- Directory Services

- Personal Identification Services

- Location-based Services

NeuStar anticipates working with a broad base of representative organizations and government agencies to identify additional services that unlock the utility of the usTLD to serve the American Internet community.

Process for Enabling Enhanced Applications and Services
NeuStar has a history of managing shared public resources while simultaneously introducing enhanced features and functionality in a responsible and even-handed manner. These neutral and responsible practices will be mirrored in the introduction of enhancements in the usTLD.

NeuStar will manage the introduction of new enhanced services and applications in an open, neutral, and responsible manner. The usTLD will be well suited to serving the interests of the public—the way the government, citizens, business, and organizations communicate and interact. In many instances, NeuStar simply will enable enhanced services offered by others that leverage the combined benefits of the usTLD address space and NeuStar's technically advanced registry. In these instances, no change in policy will be warranted. Nevertheless, NeuStar will follow a strict process for the introduction of any new services. All new services will be analyzed for their technical and operational feasibility, and receptiveness to the usTLD existing or potential user base, and will be openly discussed within a proposed usTLD Policy Council. The Council will provide policy comments and recommendations concerning the proposed new enhanced services.   A detailed discussion of the Council is found in Section B.3.5.

The technical evaluation criteria will include, but is not limited to, ensuring that service level agreements will continue to be met or exceeded, that interested parties needs are met, and that intellectual property rights and registrant privacy is protected.

After NeuStar affirms the feasibility of a new service, it will seek approval by the DOC for implementation. NeuStar will develop a document to assist in the approval process; this

proposal will include a description and price of the enhancement. As shown in Exhibit D-1, NeuStar will comply with the request to have all new services approved by the DOC.

Public Resource Domains

Public Need

The current locality structure generates lengthy names that are difficult to remember, but this is most notably because the requisite contextual information is typically beyond the fourth level. While we will be taking direct second-level registrations as the administrator of the usTLD, we propose to explore the management of "public resource" domains that serve as a common naming scheme to allow for convenient and consistent naming of various public interests and services. These condensed hierarchies afford Internet users the opportunity to easily locate the information they seek without complicated trial-and-error searching. They will cross many district or state lines and be relevant to all citizens of the United States.
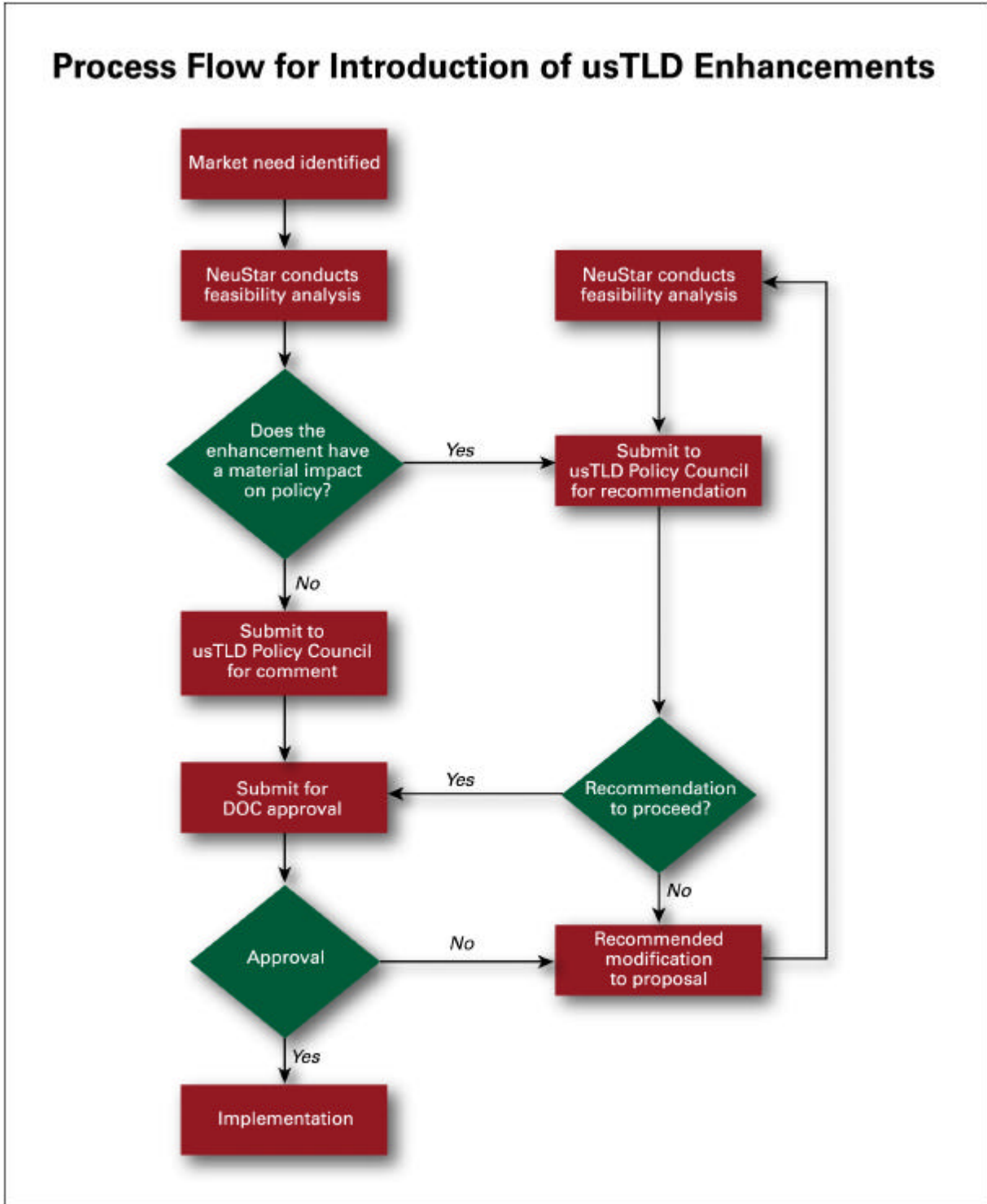
The usTLD is quite naturally the proper TLD for establishing such a condensed hierarchy, since the purpose would be to serve the American public.

Enhanced Services

Numerous second-level domain names could be reserved to create unique and content-specific spaces on the Internet to serve a variety of citizen-centric public interest needs. NeuStar can responsibly manage the third-level registries for each of these name spaces, through a sponsor approved by the usTLD Policy Council and the DOC, to maximize the overall utility of the second-level name.

The domain names could be registered through the sponsoring, name-specific channel that has an interest in the preservation of the name for a specific use. An example of a public resource hierarchy NeuStar could manage for the benefit of the U.S. public includes:

- *Park.us*—a single reference point for all parks—national, state, or local—that are physically located in the United States, where the name of the park is registered at the third level (e.g., arcadia.park.us, everglades.park.us, or grandcanyon.park.us). Currently, because our U.S. parks fall under various jurisdictions, they are governed by disparate bodies, and do not have a single reference point to provide direct resolution. Park.us could offer a common structure for citizens to gather information about any U.S. park under a memorable naming convention.

Exhibit D-1. *NeuStar's process for introducing enhanced services and applications is approached in an open and responsible manner, with full involvement of the DOC and the usTLD Policy Council.*

Other examples of second-level domain names NeuStar could manage (i.e., NeuStar would take third level registrations for the sponsored second level):

- Vote.us—the name space dedicated to campaign information and potentially a future forum to enable online voting

- Veterans.us—a reserved structure dedicated to the needs of U.S. Veterans. Organizations that provide informational resources and services that are relevant to Veterans might register within this space.

- Kids.us—A "safe" space on the Internet that is specifically tailored to the needs of children. To avoid improper use of the space, a third party sponsorship approach likely would be utilized.

- Healthcare.us—a naming structure designed to allow citizens to locate and access healthcare services and programs and to facilitate HIPPA compliance.

- Library.us—an area of the Internet where citizens can identify libraries

- Zip.us—A space in which zip codes can be utilized to enhance navigation or to provide location-based services. Citizens could then easily locate local government resources and services.

By having a single administrator for these public service domains, the user community will better associate the domain name space with the high standards and reliability of the NeuStar registry. This will further the notion of the usTLD as a trustworthy space managed for the benefit of the U.S. public, a ccTLD that propagates the U.S. image as the pioneers of the Internet.

NeuStar's Enabling Role

The NeuStar registry is uniquely positioned to manage these public resource hierarchies through the design of our Internet registry. The registry will manage domain names at any level with equal standards for reliability and security, for the same competitive price. NeuStar will extend its infrastructure to the third and fourth level domains to ensure highly reliable and secure namespaces. Additionally, because these hierarchies will be centrally managed, NeuStar can provide directory services to facilitate user searching.

Recommended Process

NeuStar has proposed a draft list of names for reservation by the usTLD Administrator (see Section B.3.5) and would work with the proposed Council and DOC to introduce enhanced services for these namespaces in a fair and responsible manner. We will also conduct additional outreach activities to identify other namespaces that would serve the public interest and to identify potential sponsors where appropriate. NeuStar will actively seek comment and input from delegated managers and organizations currently utilizing the existing hierarchical space or with a public interest in the space prior to the introduction of Public Resource Domains.

NeuStar will develop a document to assist in the approval process. NeuStar will comply with the request to have all new services approved by the DOC.

E-government

Public Need

The usTLD should be utilized to support the directive from the White House to "use the Internet to create a citizen-centric government." As more government agencies move critical

components of their operations online, the need for a secure space increases. Moreover, an addressing infrastructure is a key enabler for a capability that allows citizens to find and access government informational resources, services and e-Gov applications.

In tandem to initiatives to provide a more secure platform for e-government initiatives, attempts are being made to streamline government processes and increase government efficiency. Our Internet registry architecture, our unique position as a trusted neutral third party, and our commitment to fulfillment of the US Nexus requirement uniquely positions NeuStar to meet this need. NeuStar will work very closely with the U.S. federal, state, and local governments to enable their requisite e-government initiatives.

Enhanced Services

Several e-government applications and services can be responsibly enabled through NeuStar's coordination and management of the usTLD. The primary objective of these online application areas is to allow citizens to interact with the government in a direct, secure forum. According to a study by the Council for Excellence in Government, the majority of Americans feel that e-Gov would have a positive effect on government. Many such initiatives are underway today: motor vehicle administrators allow for license and registration renewals, public safety organizations take payment for fees and services, the Internal Revenue Service accepts tax forms via their secure site. Future e-government applications enabled by the usTLD addressing mechanism could include:

- Enabling direct communication between elected officials and their constituencies,

- Introducing a naming structure to streamline any processes whereby individuals are required to populate standard forms and submit to a government agency,

- Facilitation of public forums or "town hall" meetings to open forums for all citizens, including those who are not physically able to attend, and

- Providing an addressing structure for centralized procurement facilities or exchanges for state and local governments to maximize purchasing power.

Because of the critical nature of e-Government applications, it is crucial that the usTLD administrator have demonstrated technical expertise, real-world operating experience, an established position as a trusted neutral third party, and the ability to provide a highly reliable and secure environment.

NeuStar's Enabling Role

Because the NeuStar platform is being developed to perform at high levels of service availability and will employ encryption technology, it is a logical domain space for all U.S. governmental bodies—national, state or local—to develop their critical online initiatives. NeuStar currently manages a mission-critical public resource for the communications industry (e.g. the public switched network relies on NeuStar numbering databases), and is prepared to do the same for the public sector through administration of the usTLD.

Recommended Process

NeuStar proposes to work with the usTLD Policy Council and the DOC to conduct an outreach program, which will include current e-Government service providers, to identify ways in which the usTLD addressing scheme can be leveraged to enable e-Gov services that reduce government cost, improve accessibility and productivity, and serve the American people.

NeuStar will develop a document to assist in the approval process. NeuStar will comply with the request to have all new services approved by the DOC.

Directory Services

Public Need

One of the primary enhanced services NeuStar proposes for increased ease of use of the usTLD is directory services. We propose to evaluate, trial, and implement a series of sophisticated directory search capabilities for services and sites on the usTLD. The primary reason the existing locality-based hierarchical structure is awkward to use is the absence of a comprehensive search capability for users to locate the service of interest without having to know the exact fully-qualified domain name. While numerous search engines exist in the Internet, none of them allow the user to pre-select U.S.-based services, specifically ones meeting the Nexus requirement or that are named using the usTLD. Consequently, prospective users must wade through long and confusing lists of services across the entire Internet to find the specific one of interest. The presentation order and content is dictated by the search sites' commercial policies, not necessarily the public interest.

Enhanced Services

A directory service for the usTLD would provide not only a separate navigational schema for the TLD while retaining the existing locality-based name structure, but would provide a usTLD-specific search capability that doesn't currently exist elsewhere, and provide for consistency and uniformity in the listings of usTLD entries. This is extremely important for government services accessed through the locality structure, as there is no pervasive user-friendly government-service-specific directory today. Commercial search sites intermix listings for government and commercial sites, obscuring which services are official government services versus similarly listed commercial services, thus confusing potential users and causing potential security and fraud problems.

One of the first objectives would be to establish a keyword schema for categorization and characterization of the existing usTLD entries, and the primary service associated with each entry (URL using the usTLD). The keyword to URL mapping forms the core of the directory, along with appropriate fields from the Whois data. This data can then be searched from the web, using any number of attributes (service name, offering entity name, associated locality info, e.g. state or county), at a site to be established, e.g. http://www.search.nic.us/. In addition, it is possible to re-direct web inquires to non-existent (incorrect) usTLD names to the search site to solicit the user to navigate to the site of interest through the directory instead. This type of mechanism makes the directory an automatic help capability and significantly aids in usTLD usage. Users would be encouraged to add a site to their bookmarks to streamline navigation in the future.

In addition to a web-based search capability, NeuStar would propose to also provide directory listings online accessible via standard (IETF) directory protocols such as LDAP, and newly emerging so-called fuzzy search protocols such as CNRP (common name resolution protocol). Lastly, NeuStar could also make the directory database available to commercial search sites to increase accuracy and usability of usTLD data they have.

Lastly, a comprehensive directory search capability makes it possible to facilitate foreign language navigation to these same sites. In some areas of the U.S. foreign language (e.g., Spanish) access is important and even mandated. Keywords and directory listings in other languages in addition to English of the same usTLD sites will facilitate these important local policies.

NeuStar's Enabling Role

The enablement of directory services by the NeuStar thick registry within the usTLD would provide an important mechanism by which both the private and public sector users could easily find information, products, and services provided by companies within the United States.

Furthermore, this capability would allow citizens to easily find public services and interact with local, state, and Federal government agencies.

Recommended Process

NeuStar proposes to work with the proposed usTLD Policy Council and the DOC to fairly and responsibly implement Directory Service enablers within the usTLD addressing structure. Both public and private sector directory needs will be pursued.

NeuStar will develop a document to assist in the approval process. NeuStar will comply with the request to have all new services approved by the DOC.

Personal Identification Applications

Public Need

Over 116 million Americans are online, and each could utilize a unique personal identifier in their browsing, purchasing, or other use of the Internet. Effective use of the usTLD, in the interest of the American people, should include protection mechanisms so any American citizen could elect to register a unique personal domain name tied to any information they wish to associate with themselves for use on the Internet. These names could be the key for streamlining access to information, reducing the need to re-enter identification information to sites that are not secure, or for dynamic assignment between sites or platforms.

Enhanced Service

The need and market for various forms of globally unique, administered namespaces is well understood within the Industry. The use of "distinguished keys" is a well-known concept that we all use in various contexts. The most obvious one is the use of Social Security numbers as a "distinguished key" that links data about us in various contexts. The overuse of the SSN in various industries has created substantial concerns about privacy, formalizing the need for other forms of nationally unique identifiers. As we move online, an addressing system such as the DNS, which provides a one-to-one unique resolution, is a logical mechanism, and the usTLD a logical extension for U.S. citizens.

The core value proposition is the creation of namespaces directly under the control of consumers that can be "dynamic," in the manner in which they are accessible across a variety of applications. The product offered to the consumer will be the opportunity to obtain a domain name during the registration process that could be used for:

- Applications where personal name and identity is not required or suitable;

- Permissioning of information established by a custodian of the name-holder, i.e., a parent, to limit access to information; or

- Permissioning of information from the name-holder to those trying to access their information.

The name, coupled with digital security and encryption technology, could be a single online identifier for U.S. citizens. This identity could be used in a variety of applications and sites, at home or in the office, with the assurance of confidentiality.

An important element of this service would be the ability of an end user to determine what information is accessible by whom ("permissioning"), and also to decide what organization stores the data. As a neutral third party, NeuStar is a viable alternative repository for personal information or pointers that would redirect queries to other repositories selected by the end user.

NeuStar's Enabling Role

We believe that optional user-controlled digital identifiers would accelerate the adoption of electronic services in both the private and public sectors. Given that the usTLD is a public resource utilizing this capability within the usTLD to improve access to public services and to facilitate e-Gov applications including Business to Government (B2G) is particularly appropriate.

NeuStar, as a part of its existing core businesses, is in possession of confidential and competitive information and follows strict rules to ensure protection of confidential data. A Code of Conduct that restricts the resale of our data for marketing purposes, and a Whois database design that calls for a two-step process to elicit registrant information, are examples of our commitment to privacy. From a technology perspective, the extensible fields of the NeuStar Internet registry are fully capable of securely storing (registrant granted) personal data and its permissioning rights.

Recommended Process

As with any innovation, it is difficult to predict with certainty the degree of acceptance and use; however, in this case, the potential benefits appear to be compelling. NeuStar is therefore prepared to make the investment required to enable this enhanced utility within the usTLD. We propose to work with the usTLD Policy Council ("the Council") and the DOC to introduce Personal Identification Services within the usTLD in a fair and responsible manner.

NeuStar will develop a document to assist in the approval process. NeuStar will comply with the request to have all new services approved by the DOC.

Location-Based Services

Public Need

Today the Internet is indexed and navigated based primarily on domain name via the URL line of browsers and key word via search engines. Although this has served the user community well, many users seek information, resources, products, and services that by their very nature would be more conveniently organized by geographic location. Such an enabler could be applied to, for example:

- Identify attractions at a vacation destination,

- Locate the nearest ATM,

- Find a nearby plumber,

- Provide the address of the nearest gas station, or

- Locate the nearest motor vehicle office.

The need to organize information based on geography is most readily apparent in mobile applications. Knowing where a user is located is not enough to provide useful services. End users, networks, and applications need a simple way to identify what products, services, and resources are located within the surrounding area.

Other than registering in geographically-oriented hierarchical namespaces (e.g., www.aservice.centreville.va.us), which has proven to be unattractive from a marketing perspective and impractical for multiple locations, there is there is no agreed upon globally resolvable mechanism for registering a location or multiple locations against a domain name. The location-based service capability described below provides a practical solution that satisfies an identified user need.

Enhanced Service

In order to facilitate this capability, NeuStar proposes to reserve all of the longitude and latitude coordinates that make up the United States and its territories under the usTLD. One or more locations would be associated with a domain name, and each location would in turn be associated with its geographic coordinates, which would be stored in the thick registry database.

Location registration would take place through registrars, resellers, delegees, and other service providers. Registered locations would be automatically geographically coded for longitude and latitude by the Registry based on physical address. The longitude and latitudes associated with a domain name and relevant key words will be stored in the "thick registry" database. Resolution by location will take place via API interfaces provided by NeuStar to search engines, geographically oriented portal providers, wireless operators, and other enhanced-applications providers or through direct query to the registry via client-based software. This would allow an end user to search on a particular key word for a given geographical location (e.g., search on key word "bicycle" to find all bike shops within 10 miles of a given address). The same location-based service enabler could allow an individual to locate government offices or public services in a particular geography.

NeuStar's Enabling Role

The NeuStar thick registry architecture has the ability to support enhanced applications that require transactional resolution of queries based on parameters other than domain name. Given the geographic nature of any ccTLD, enabling location-based services within a country code would seem to make perfect sense. NeuStar seeks to enable this enhanced utility within the usTLD so that usTLD registrars, resellers, delegees, and service providers may offer domain name registrants the ability to register their locations against their domain name at an additional nominal fee and so the usTLD can be the first to offer this useful and innovative capability.

Recommended Process

As with any innovation it is difficult to predict with certainty the degree of acceptance and use; however, in this case the potential benefits appear to be compelling. NeuStar is therefore prepared to make the investment required to enable this enhanced utility within the usTLD. We propose to work with the usTLD Policy Council and DOC to introduce location-based services within the usTLD in a fair and responsible manner.

NeuStar will develop a document to assist in the approval process. NeuStar will comply with the request to have all new services approved by the DOC.

Each of the enhancements described represents a brief sample of the innovations possible within the usTLD. All enhancements will be closely evaluated to ensure that the stability of the Internet is maintained and that the usTLD is balanced with the goal of increasing utility.