.TEL

An Innovative Use
of the DNS

THE CONCEPT

The .tel uses the Domain Name System (DNS) in a way that empowers .tel domain owners, whether businesses or individuals, to control how and where people can communicate with them.

Traditional Top Level Domains (TLDs) use the DNS to return Address records or IP addresses that are used to reach websites or send email. In the case of a website, when users look up IBM.com, their device queries the DNS for IBM's IP address (the Address record). The DNS returns the IP address associated with IBM.com (129.42.18.103) and the device uses the IP address to locate and view the IBM website.

All existing Top Level Domains use the DNS in this traditional way. However, the .tel does not communicate with web content or email -- it enables communication with people. It therefore requires an approach to storing contact information directly in the DNS for which Address records are inappropriate, since an Address record cannot identify a phone number or a VoIP service address, such as a Skype or Yahoo! Messenger.

The .tel will allow contact information to be stored directly in the DNS so that when a device performs a query for a .tel domain (i.e., AdamSmith.tel), the DNS will not respond with an Address record, rather it will return the contact information directly to the device, which enables the click-to-communicate functionality. The following demonstrates how a mobile device can initiate communication using a .tel domain name.

Step 1. As shown in the diagram to the right, the user looks up AdamSmith.tel on his Internet enabled mobile telephone.

Step 2. The device uses its local network (GPRS, 3G, WiFi, Ethernet, etc.) to query the DNS for AdamSmith.tel.

Step 3. The DNS responds with the contact information Adam Smith chooses to store within his .tel domain. This could include a mobile phone number, an email address, his office phone number and much more.

Step 4. The user elects to call Adam Smith on his mobile phone from the proposed list and clicks-to-communicate.

Step 5. Adam Smith is contacted by the user on the mobile phone number of his choice.

At any time and as often as he wishes, Adam Smith can update his contact information stored under his .tel domain name, reflecting changes in how he wishes to be contacted. Every change he makes is immediately visible because it is be published and propagated through the DNS.
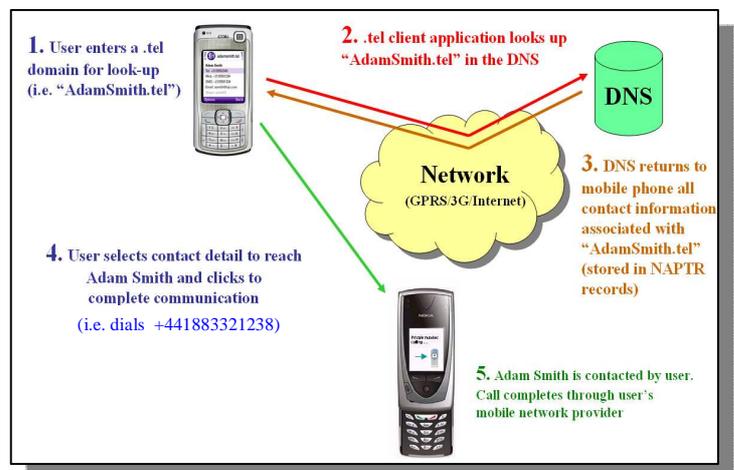
Anyone with an Internet connection may access or read any .tel domain, as shown below.

However, a person or a company wishing to *publish* contact information directly within the DNS will need to purchase a .tel domain.

The storing of data in the DNS is accomplished through the use of three types of DNS records: NAPTR, TXT and LOC records.

THE TECHNOLOGY

The .tel is the first TLD to harness NAPTR, TXT and LOC records within the DNS and thereby power a compelling solution for contact management that enables both individuals and businesses to store data directly within the DNS.

NAPTR records are a recent and more flexible DNS resource than the conventional Address records used thus far. The stability and robustness of NAPTR records have been proven in a protocol called ENUM, a mechanism for translating telephone numbers into domain names. However, unlike ENUM, the .tel is not encumbered by the regulatory environment found in the conventional telephony world. Additionally, unlike ENUM, .tel is not linked to a single phone number and is therefore portable.

NAPTR records are at the core of what makes the .tel domain powerful and meaningful to individuals and businesses. These NAPTR records will allow for the publication and management of contact information in a way never before possible, including phone numbers

(both mobile and fixed line), email addresses, fax numbers, VoIP service identities such as Skype, AIM, MSN (and allow users to distinguish between them), links to webpages, maps and blogs.

These NAPTR records can also point to other NAPTR records, allowing for navigation through a tree of contact information based on geography, department or any other segmentation. They allow for unlimited updating of dynamically changing content and offer immediate global access to all newly updated information. They can be encrypted to protect confidential data and all data returned within the NAPTR records is clickable, enabling a click-to-communicate feature, which makes communication using the .tel as easy as possible for the users.

In addition to storing NAPTR records, the .tel uses Text records or TXT records stored directly within the DNS. These TXT records allow for the publication of text based information such as names, titles, mailing addresses, and keywords that will help users search for and find the right person or business they wish to contact. These keywords may be easily indexed and searched, enabling the creation of a DNS-based global white and yellowpages directory service.

Lastly, the .tel uses Location records or LOC records to publish geo-location information. This allows businesses and individuals to indicate their precise location. The benefits of publishing live LOC records will increase as more advanced location-based services emerge over the coming years.

COMPARATIVE ANALYSIS OF DNS VERSUS WEB-BASED SOLUTIONS

The .tel is a Top Level Domain using innovative DNS technology to power a communication-based Internet service.

In comparison to current web-based solutions, .tel provides a much more structured, efficient, and reliable offering.

The following table highlights key advantages of the .tel DNS solution over traditional web-based solutions:

Feature	.tel DNS / NAPTR-based solution	Traditional web-based / Address record solution
Speed	NAPTR records are very small, mostly transmitted over User Datagram Protocol (UDP) and extremely quick	Webpages are large, transmitted over HTTP connections and can be slow especially on mobile telephones
Cost	Due to the small size of NAPTR records, they can be cheap to transmit over mobile data networks	Viewing webpages on mobile phones can become expensive due to their size
Complexity	Publishing contact data can be done in a few simple clicks	Publishing webpages is a complex and time-consuming activity
Scalability	DNS is designed to be highly scalable	Web-based services become expensive and cumbersome to run in large volumes
Reliability	The DNS-based solution is inherently a globally distributed system that is scalable and has no single point of failure	Web-based services are prone to downtime and single points of failure
Global Access	DNS-based services are open and accessible without the need for logging in or becoming a member	Web-based services require users to login before a service can be used
Visibility	.tel will receive exceptional visibility as an emerging standard for communications because it is a Top Level Domain	Web-based services are much more commonplace and hence do not benefit from the market visibility available to newly issued Top Level Domains
Setup	The DNS-based solution has no need to construct and maintain a website	Web-based solutions require construction and maintenance of a website