
.tel: Innovation in DNS Data Storage



ABSTRACT

Traditionally, domain names have been about mapping human-readable text to IP addresses of machines hosting websites. On the other hand, the .tel domain maps human-readable text to contact methods such as phone numbers. The .tel domain is not about reaching websites, it's about connecting people. This domain is a new TLD dedicated exclusively to communications that enables people and businesses to store, update, and publish contact information, web links and keywords under a unique domain name.

This paper outlines the technology of using the domain name system (DNS) to store contact information. You will learn about resource record types used to store contact data, the privacy model that enables .tel domain owners to control access to their personal information, and about open-source software released by the Sponsoring Organization to facilitate adoption of .tel.

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REFERENCES

1. DDDS RFC 3401, <http://tools.ietf.org/html/rfc3401> and RFC 3403, <http://tools.ietf.org/html/rfc3403>
2. NAPTR Record RFC 3761, <http://tools.ietf.org/html/rfc3761>
3. LOC Record RFC 1876, <http://www.ietf.org/rfc/rfc1876>
4. <http://www.ietf.org/internet-drafts/draft-ietf-enum-experiences-09.txt>
5. http://enum.nic.at/documents/Diverse/Background_to_NAPTR.html
6. "Protecting .tel Contact Data", whitepaper Telnic Ltd., September 2008
7. "NAPTR Records in .tel", whitepaper Telnic Ltd., September 2008

WHAT IS .TEL ALL ABOUT?

The .tel top-level domain sponsored by Telnic Ltd. offers a new and unique way to use the domain name system. With .tel, the DNS becomes a data store for contact information, such as VoIP, telephony, email, Skype, IM, etc. – a global decentralized contact directory.

Benefits for users:

- Full control over published contact data
- Publication and updates to contact data in real time
- Control over the distribution of private data to specific groups of people
- Ability to specify keywords by which users want to be found

Unlike traditional DNS systems, .tel does not accept A-records with IP addresses pointing to machines hosting websites. Instead, publication of data within .tel is done using NAPTR resource records (naming authority pointer) [1], [2]. In a NAPTR record, contact information is encoded as a URI (universal resource identifier), such as a web link or a telephone number. NAPTRs can be ordered and labeled; e.g., a “work” phone number with the highest priority during working hours. NAPTRs can also point to other domains and sub-domains; these are called non-terminal records. This powerful record type is new for DNS systems, and can be further extended to match new means of communication [4].



Usage of NAPTRs for data storage offers a number of unique benefits:

- **Internet without websites**, a “webless Web”. With .tel, contact data is published directly in the DNS and the display and processing of this data is fully decoupled from the data itself. Entering a .tel domain name query in a browser returns a web page generated from currently available resource records by a proxy service. In addition, a number of client .tel plug-ins have been developed to integrate .tel support into customer PCs and mobiles.
- **Integration with other applications**. Because .tel contact data is stored in NAPTRs, your browser or client application recognizes the type of contact and launches the corresponding application. For instance, clicking a Skype ID will start a Skype call, and selecting an email address start a mail client.
- **Highly-structured contact information**. With non-terminal NAPTRs, a domain can conveniently point to its sub-domains, and with the DNS capacity for sub-domain levels, a huge amount of data can be neatly structured and cross-linked inside a .tel domain. For instance, hertz.tel could link to europe.hertz.tel to uk.europe.hertz.tel to london.uk.europe.hertz.tel, which would include the call center number and street address of Hertz car rental offices in London, UK.

For details on NAPTR record usage in the .tel DNS, see “NAPTR Records in .tel” [7].

Other record types allowed inside .tel domains are LOC [3] and TXT records to store the location of the domain owner and any free-form text and searchable keywords with which the domain owner wishes to be associated and found. These enable a Tel-wide search facility. Finally, the NINFO resource record type enables adding text strings with the status of the zone, so that a .tel domain owner can add messages like "I'm on vacation" or "In the office".

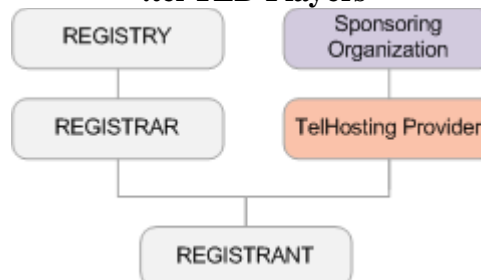
HOW .TEL REGISTRATION WORKS?

The procedure for registering a domain name and publication of data in this domain is different for .tel domain names.

Typical TLD Players



.tel TLD Players

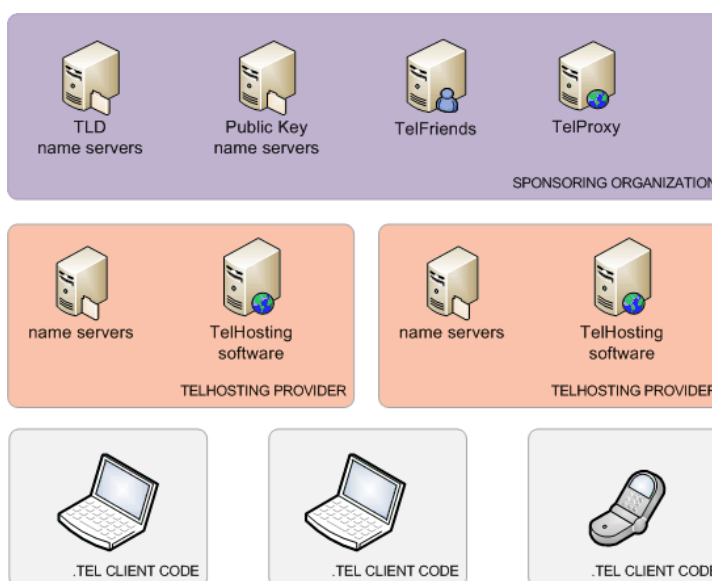


- **Registry** - organization managing a centralized database of domain names and providing first-level DNS service for a given TLD
- **Registrar** - company accredited to register and manage domain names
- **Registrant** – domain holder
- **Sponsoring organization (SO)** – Telnic Ltd., company controlling .tel acceptable use and other policies and providing a set of services to support the .tel platform
- **TelHosting Provider** – organization accredited to operate name servers that host .tel domains; Telnic or a registrar or a third-party organization can act as the TelHosting Provider

TELNIC SOFTWARE AND SERVICES

Different DNS usage means different domain content support services.

1. **SO Level:** the TelProxy service responding to HTTP requests on .tel domain names, plus services to support the privacy model.
2. **TelHosting Provider Level:** TelHosting Software for managing NAPTRs published in .tel domains. This Java application exports a standard SOAP API to client applications.
3. **Client Level:** Multiple desktop and mobile clients for performing lookups of .tel names and managing .tel domains.



You can view .tel contact data online: the TelProxy service creates a web page automatically from records published in a given domain. You can also use the TelHosting Software web interface to log into your account and edit your contacts. Alternatively, you can select your client applications and manage your account from your mobile or PC. All client applications interact with TelHosting Software via the standardized SOAP APIs. All the software is released under an open-source license.

PRIVACY MODEL

Owners of .tel domains need to prevent unsolicited communication as a result of publishing their contact details in a public system like the DNS. For that, a “friending” mechanism has been implemented, so that a domain owner can restrict access to specific pieces of information by certain people, similar to a friend list in other systems. For example, you can make your work number public and restrict access to your cell phone number to just your family and lawyer.

To support access rights manipulation, Telnic has implemented a security model based on a friending mechanism. With this model, domain owners encrypt sensitive information into “protected” NAPTR records and publish them in designated sub-domains for each individual user, who has been granted access to this data. The reader of protected content has a public/private key pair, and the publishing domain owner uses that public key to encrypt data for that user. The reader can then use the private key to decrypt the data. The friending system takes care of the details of generating and distributing the keys, so that the holder of a .tel domain can securely make protected contact data available to family members, colleagues, friends and so on. For more information on the privacy model, please read the whitepaper "Protecting .tel Contact Data" [6].