

# Technical Roadmap for Root Zone Management

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**PTI** | An ICANN Affiliate

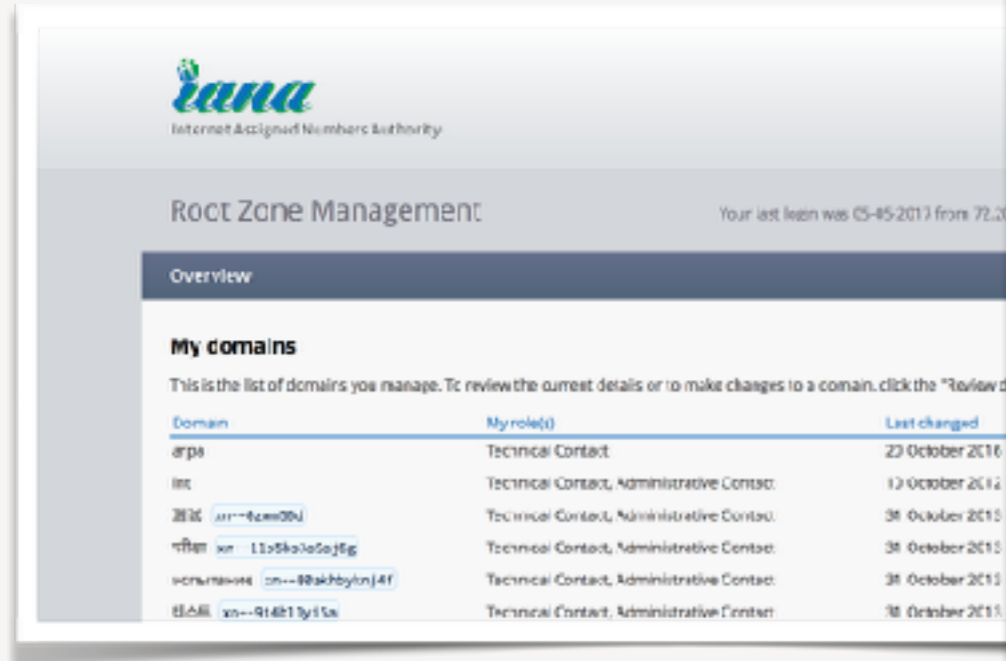
# Root Zone Management

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- We manage the root zone and associated database, which is comprised of the official record of top-level domains and the technical delegation data.
- We provides interfaces to TLD operators to perform changes, such as routine updates as well as transfers.
- We review all changes, ensure they meet technical and operational requirements, and are consented by the right parties. We send validated root zone file changes to Verisign as the Root Zone Maintainer to publish delegation data changes to the root servers.
- Much of the mechanisms and practices associated with the root zone are inherited from many decades of operation.

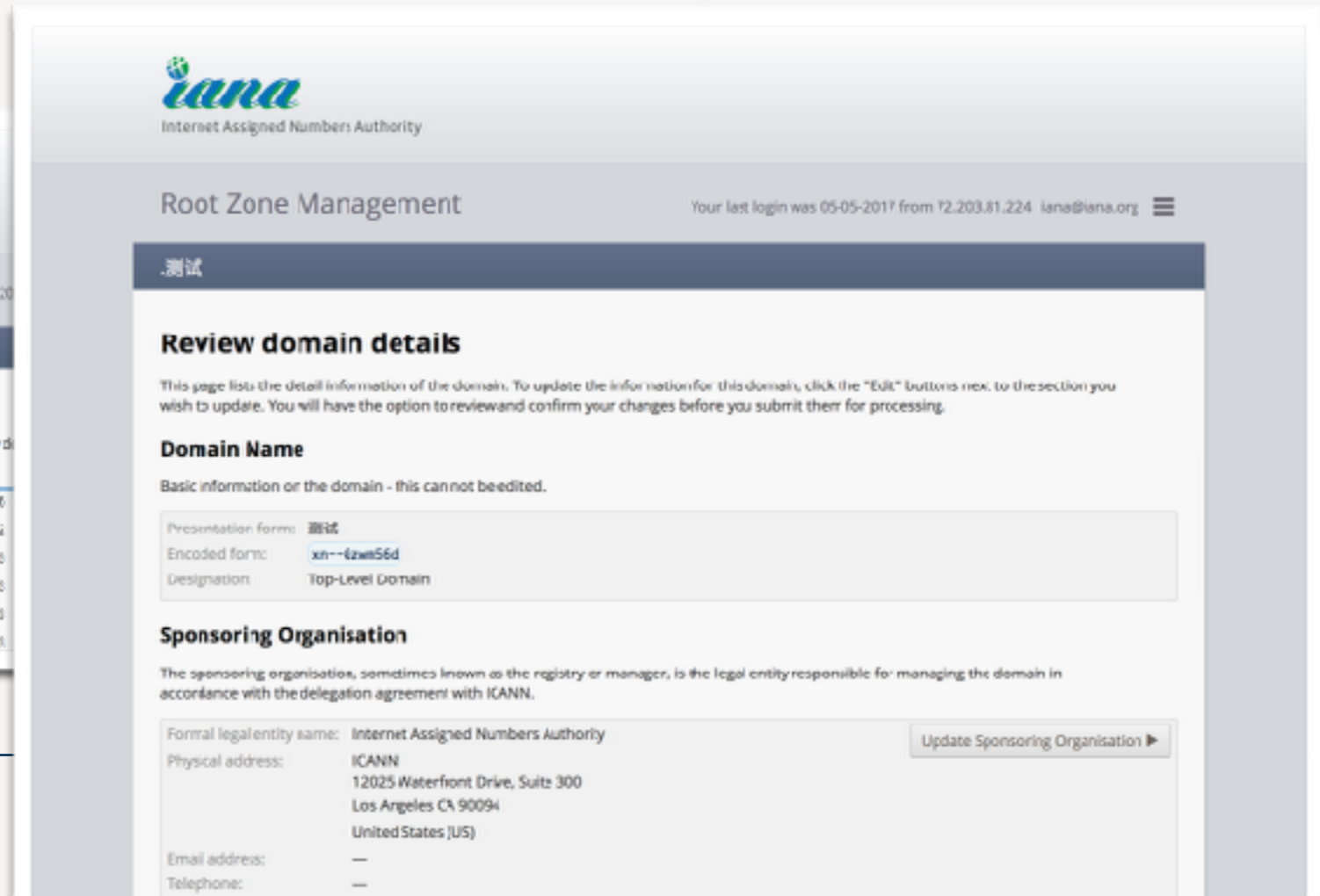
# Root Zone Management System

- Around ten years ago, the Root Zone Management System (RZMS) was released.
- Provides self-service capability for TLD managers, and manages the entire workflow of change requests through stages of processing.
- Prior to RZMS, root zone workflow was fully manual.
- Major changes to date: DNSSEC, New gTLD Program and IANA stewardship transition



The screenshot shows the 'My domains' overview page in the RZMS. It features a table with columns for 'Domain', 'My role(s)', and 'Last changed'. The table lists several domains including 'arpa', 'int', and various IDN domains like 'xn--4cm0b4' and 'xn--1175kca0a5aj6g'. Each row indicates the user's role (e.g., Technical Contact, Administrative Contact) and the date of the last change.

Domain	My role(s)	Last changed
arpa	Technical Contact	23 October 2016
int	Technical Contact, Administrative Contact	12 October 2012
测试 xn--4cm0b4	Technical Contact, Administrative Contact	31 October 2015
नीलम xn--1175kca0a5aj6g	Technical Contact, Administrative Contact	31 October 2015
icann:iana xn--80akbbylnj4f	Technical Contact, Administrative Contact	31 October 2015
测试 xn--914813y15x	Technical Contact, Administrative Contact	31 October 2015



The screenshot shows the 'Review domain details' page for the .测试 domain. It includes a section for 'Domain Name' with fields for 'Presentation form' (测试), 'Encoded form' (xn--4cm0b4), and 'Designation' (Top-Level Domain). Below this is the 'Sponsoring Organisation' section, which lists the 'Formal legal entity name' as 'Internet Assigned Numbers Authority' and provides the physical address: 'ICANN, 12025 Waterfront Drive, Suite 300, Los Angeles CA 90094, United States (US)'. There is an 'Update Sponsoring Organisation' button.

**Review domain details**

This page lists the detail information of the domain. To update the information for this domain, click the "Edit" buttons next to the section you wish to update. You will have the option to review and confirm your changes before you submit them for processing.

**Domain Name**

Basic information of the domain - this cannot be edited.

Presentation form: 测试  
Encoded form: xn--4cm0b4  
Designation: Top-Level Domain

**Sponsoring Organisation**

The sponsoring organisation, sometimes known as the registry or manager, is the legal entity responsible for managing the domain in accordance with the delegation agreement with ICANN.

Formal legal entity name: Internet Assigned Numbers Authority  
Physical address: ICANN  
12025 Waterfront Drive, Suite 300  
Los Angeles CA 90094  
United States (US)  
Email address: —  
Telephone: —

Update Sponsoring Organisation ▶

# Root Zone Management System Roadmap

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## Planned updates to existing system



New automated workflows



New DNSSEC algorithm support

## Next-generation rearchitecture



New authorization model



New technical check implementation



New customer API



New security options



FOI implementation



## New automated workflows

- Routine change requests are currently sent between PTI and Verisign via EPP.
- Three business processes are still manually communicated:
  - Changes to the authorities for the root zone
  - Deletion of a TLD
  - Escalation of a change request to be an “emergency”
- Aim is to have 100% of interactions communicated via EPP later this year
  - Stipulated in the Root Zone Maintainer Agreement



## New DNSSEC algorithm support

- Current suite of algorithms were those supported in 2010 with comprehensive software support.
- New algorithms, particularly associated with elliptic-curve cryptography, are now available.
- Aim is to support new algorithms and digests as mature implementations are available.
- Deprecating algorithm and digest types to be left for future consultation on technical checks.
- Under active evaluation by development teams.
- Should we consider whether to allow untestable algorithm types in the root zone?

### Algorithm Types

DSA/SHA-1
RSA/SHA-1
DSA-NSEC3-SHA1
RSASHA1-NSEC3-SHA1
RSA/SHA-256
RSA/SHA-512
GOST R 34.10-2001
ECDSA P-256 SHA-256
ECDSA P-384 SHA-384
EdDSA 25519
EdDSA 448

### Digest Types

SHA-1
SHA-256
GOST R 34.11-94
SHA-384



New authorization  
model

- New mechanism to address pain points our customers see with the current method of submitting and approving root zone change requests.
- Find a mechanism that is flexible to allow for different configurations.
- Key foundation is decoupling the “authorization” and “published contacts” pieces of being a TLD contact.
- Seeking feedback as we commence development.



## New authorization model

### Administrative Contact

- 1 Listed in public WHOIS
- 2 Approves change requests
- 3 Must be in country (ccTLDs)

### Technical Contact

- 1 Listed in public WHOIS
- 2 Approves change requests





## New authorization model

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### Technical Contact

- 1 Listed in public WHOIS
- 2 Approves change requests

### Administrative Contact

- 1 Listed in public WHOIS
- 2 Public information only, not used for authorisation
- 3 Must be in country (ccTLDs)

### Technical Contact

- 1 Listed in public WHOIS
- 2 Public information only, not used for authorisation

### Authorising Contacts

- 1 Not published (managed via RZMS)
  - 2 Approves change requests
- 
- One or more (no fixed number)
  - Must be persons (no role accounts)
  - Stronger identity controls
  - Flexible threshold approval options
  - In-country requirements?

## New Flexible Model

*Transition process*



## New technical check implementation

- Separating the technical check processes into a separate system.
- Can be maintained independently of the RZMS.
- Published openly.
- Richer reporting and analysis.
- Comprehensive debugging logs kept for each test run, customers can view using self-service mechanisms.
- Better parallelism to address potential delays in current approach.
- Capability for recurring, minor issues to be marked as waivable.

## Review technical issues

We have performed a number of tests on the technical configuration for the domain. The following issues have been identified. In most normal cases these are problems that need to be fixed. On occasion they may represent normal configuration, in which case you can apply for a waiver of the requirement by providing information for us to review.

### Parent and child NS record sets do not match

Proposed for parent (root zone)	Served by child (.xyz zone)
a.ns.xyz	a.ns.xyz
b.ns.xyz	b.ns.xyz
c.ns.xyz	c.ns.xyz
d.ns.xyz	d.ns.xyz
	e.ns.xyz

[Explain this issue](#)

### Next steps

#### Do nothing

Typically you will need to take steps to fix these issues. We will continue to re-test your configuration every hour. Once we notice the issues are fixed we will automatically begin processing the request. If the issues are not fixed by **18 August 2014** the request will automatically be withdrawn.

#### Retest

If you have fixed these issues, we can re-test the configuration.

#### Apply for waiver

If you have reviewed the test results and believe they are errors that do not impact your TLD, you can apply for a waiver to ICANN staff. Our technical experts will review your explanation and make a decision whether to issue a waiver to the technical checks.

#### Withdraw

If there was an error in your submission and you wish to start a new request with the revised technical parameters, you can withdraw this request.

## Apply for permanent waiver

Certain technical configurations will often fail our technical checks. If you have a configuration that regularly fails the technical checks, you may opt to have us automatically skip those tests. Choosing these permanent waivers should be considered carefully as enabling them can mask legitimate problems that we are trying to identify to ensure the stable operation of your domain.

### Permanent waivers

#### Waive serial coherency check

Waive this requirement if your technical configuration updates the zones so regularly that the entire set is not never fully synchronised. Only registries that update their zones multiple times per minute need to consider this option. **Using this option on a zone that**



New customer  
API

- Provide a mechanism for customers to interact with RZMS programmatically (using tools rather than manually interacting with website).
- Removes error-prone steps for customers with large portfolios
- Provides easy mechanism to perform bulk operations (submissions, status checking, etc.)



## New security options

- Add two-factor authentication capability
- Migrate from role accounts to person based accounts
- Eliminate email-based submission
- Comprehensive audit trail available to customers to see who did exactly what, when.



## FOI implementation

- Implement terminology changes associated with FOI recommendations (e.g. phase out “redelegation”, “sponsoring organization”, etc.)
- Implement process changes associated with redelegation process.
  - “delegation contact”

### Who can authorize transfers to this domain?

A transfer request (formerly known as a redelegation) is the transfer of operational control to a new entity. These are considered critical changes that you may wish to configure differently from the ability to approve other kinds of change requests. [Expand](#)

Authorizer

Naela Sarras (naela.sarras@iana.org)

Kim Davies (kim.davies@iana.org)

Able to authorize

Any change request

Transfers only

Routine changes only

Transfers only

Any changes (routine and transfers)

[< Redefine authorizers](#)

[Continue >](#)

**Feedback welcome.**