

SAC054

SSAC Report on the Domain Name Registration Data Model



A Report from the ICANN
Security and Stability
Advisory Committee
(SSAC)
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Preface

This is a Report of the Security and Stability Advisory Committee (SSAC). The SSAC advises the ICANN community and Board on matters relating to the security and integrity of the Internet's naming and address allocation systems. This includes operational matters (e.g., matters pertaining to the correct and reliable operation of the root name system), administrative matters (e.g., matters pertaining to address allocation and Internet number assignment), and registration matters (e.g., matters pertaining to registry and registrar services). SSAC engages in ongoing threat assessment and risk analysis of the Internet naming and address allocation services to assess where the principal threats to stability and security lie, and advises the ICANN community accordingly. The SSAC has no official authority to regulate, enforce or adjudicate. Those functions belong to others, and the advice offered here should be evaluated on its merits.

The contributors to this Report, reference to the committee members' biographies and statements of interest, and committee members' objections to the findings or recommendations in this report, are at end of this Report.

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1. Introduction

In SAC051,¹ *Domain Name WHOIS Terminology and Structure*, the Security and Stability Advisory Committee (SSAC) proposed taxonomy to disambiguate terminology used in discussions related to domain name registration data (DNRD). The SSAC also identified features it thinks should be considered in future domain name registration data directory services,² and finally the SSAC recommended an adoption path for both the terminology and transitions to a new protocol. Among these was a recommendation to *make domain name registration data representation consistent*.

The presentation or display of information is often the focus of attention in discussions about domain name registration data, in part because these pose privacy or legal (regulatory) concerns. This Report focuses on the information that is associated with a domain name from the time a registration is created – and the domain name is thus “instantiated” in the domain name system (DNS) – until the registration expires. The SSAC thinks that gaining an understanding of what data are necessary and relevant to managing DNRD is an important step to reduce or eliminate the considerable variability in how DNRD are labeled, represented, or formatted and notes that these types of variability can be addressed through the specification and implementation of a standards-based, structured, and extensible data model. This Report offers such a model for community consideration.

The data model presented in this Report *does not* discuss presentation or display of domain name registration data but should be considered in juxtaposition with other related activities – e.g., the Draft Final Report of the Internationalized Registration Data Working Group (IRD WG)³, Registry Data Escrow Specification⁴ – so that the data model adopted by the ICANN community satisfies the broadest range of requirements possible for such applications of domain name registration data.

¹ See ICANN Security and Stability Advisory Committee (SSAC). (2011) *SSAC Report on Domain Name WHOIS Terminology and Structure* (SSAC publication No. 051), <<http://www.icann.org/en/committees/security/sac051.pdf>>.

² See SAC003: *WHOIS Recommendation of the Security and Stability Advisory Committee*; SAC 027: *SSAC Comment to GNSO regarding WHOIS studies*, SAC033: *Domain Name Registration Information and Directory Services*; and SAC037: *Display and usage of Internationalized Registration Data: Support for characters from local languages or scripts*, <<http://www.icann.org/en/groups/ssac/documents>>.

³ See ICANN Generic Names Supporting Organization (GNSO). (2012) *Draft Final Report of Internationalized Registration Data Working Group*. Marina Del Rey, CA: ICANN, <<http://gnso.icann.org/issues/ird/ird-draft-final-report-03oct11-en.pdf>>.

⁴ See Arias, F. and S. Noguchi. (2011) *Domain Name Data Escrow Specification. Internet Draft*, <<draft-arias-noguchi-registry-data-escrow-02>>.

The SSAC is a technical advisory committee. As such, the SSAC presents a data model that takes into consideration existing data requirements from registrar and registry agreements, escrow agreements, and ongoing work on internationalized registration data requirements. The SSAC makes no policy assertions; rather, it presents the data model as a candidate or straw man for community discussion and consideration and as a basis for further development.

2. Terminology

This Report uses the following terminology from SAC051:

Domain Name Registration Data (DNRD) – refers to the information that registrants provide when registering a domain name and that registrars or registries collect. Some of this information is made available to the public.

Domain Name Registration Data Access Protocol (DNRD-AP) – refers to the elements of a (standard) communications exchange—queries and responses—that make access to registration data possible. For example, the WHOIS protocol⁵ (Request for Comment (RFC) 3912) and Hypertext Transfer Protocol (HTTP) (RFC 2616 and its updates) are commonly used to provide public access to DNRD.

Domain Name Registration Data Directory Service (DNRD-DS) – refers to the service(s) offered by registries and registrars to provide access to (potentially a subset of) the DNRD. ICANN Accredited Generic Top Level Domain (gTLD) registries and registrars are required by contracts to provide the DNRD Directory Services via both port 43 and over the web interface. For Country Code TLDs (ccTLD)s, the TLD registries determine which service(s) they offer.

Domain Name Registration Data Elements (DNRDe) - refers to the elements that comprise a Domain Name Registration Data.

Internationalized DNRD - refers to the DNRD that can be represented in different languages and scripts.

Localized DNRD - refers to DNRD that contains data other than US-American Standard Code for Information Interchange (US-ASCII) (not just the capacity for it), it is referred to as *Localized DNRD*.

⁵ See Daigle, L. (2004) *WHOIS Protocol Specification*, RFC 3912, <<http://www.ietf.org/rfc/rfc3912.txt>>.

3. Domain Name Registration Data Life Cycle

To develop as complete a data model as possible, the SSAC began by considering the information that is required to manage a domain name from the onset through the expiry of a registration, taking into consideration the various administrative processes that may involve data associated with a domain name registration, and the variability among service models that may exist among TLD operators. As shown below, the representative life cycle of a domain name contains the following stages: creation, expiration, grace period, and released.

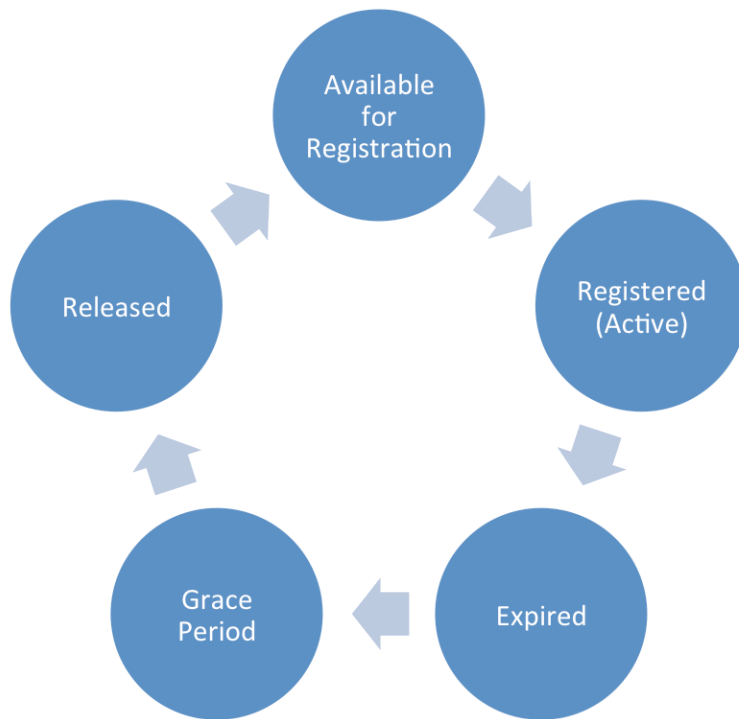


Figure 1: Typical Life cycle of a Domain Name

Several typical events drive this life cycle. These are registration, update, transfer, renew, and deletion. In the sections below, the Report describes each of these events in detail and the data elements needed to support them.

3.1 Registration Creation

Registration Creation begins the life cycle of a domain name. It is an operation whereby a registrant determines the availability of a label (delegation) in a registry and asks a registration agent (registrar or registry) to register the domain name on behalf of the registrant. Figure 2 provides a conceptual illustration of a typical registration process.

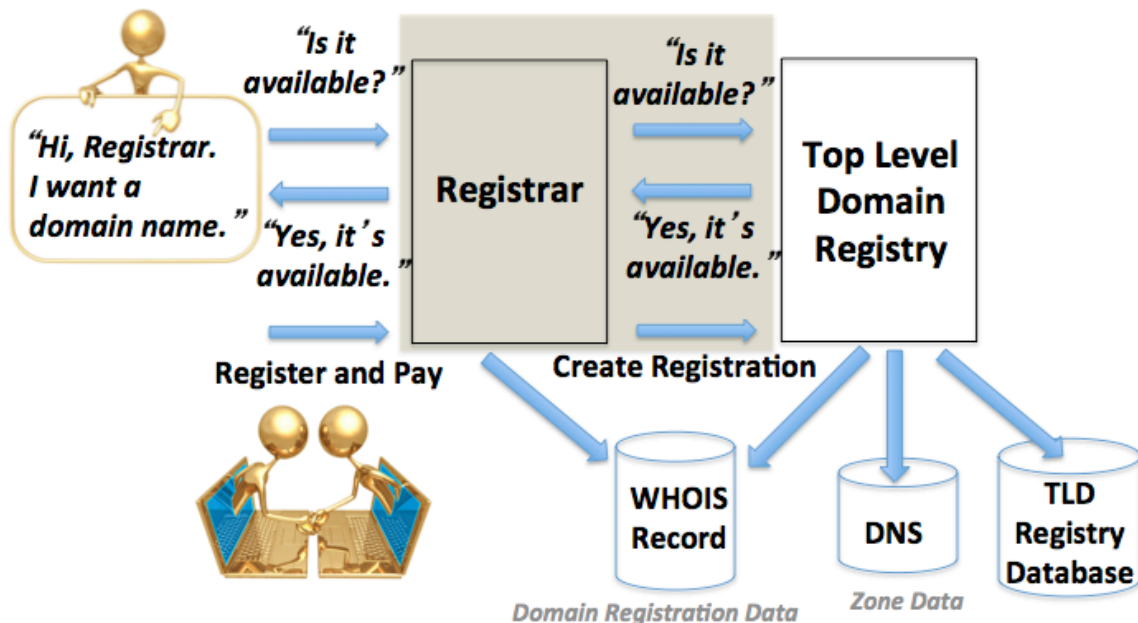


Figure 2: Conceptual illustration of registering a domain name in the domain name life cycle. Note, in current deployments, multiple of the conceptual databases referenced in this illustration (WHOIS record, DNS, TLD registry Database) could be implemented as a single database.

As illustrated above, conceptually the registration data collected is managed in separate databases that are used for the following purposes:

- A TLD Registry manages a database of second (or in some cases, third) level labels that it delegates; i.e., domain names of the form <label>.<tld>, or <label>.<{co, gov, org...}><TLD>).
- A registrar or TLD Registry manages a database of domain name registration data for Directory Services ("WHOIS services", in the nomenclature used prior to SAC051). In some cases (e.g. gTLDs), these are required services.
- A registrar or TLD Registry manages DNS configuration data: information that is used to support global domain name resolution for registered domain names.

To fulfill these purposes, the data that are collected include:

Contact Data Set: This data set is submitted by the registrant and includes the contact information necessary for the registration, administrative and technical management of the domain name. The contact data set includes the name to be associated with the registration (e.g., an organization or natural person), postal address, e-mail address, voice telephone number, and (where available) fax number. Multiple contact data sets typically

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exist, e.g., one for the registrant and one for the billing contact, and for ICANN accredited registries and registrars, a technical and administrative contact.⁶

Additionally contact data for the registrar are also needed to maintain the life cycle of the domain name. These contact data include registrar identity (ID), registrar address, registrar telephone number, registrar e-mail address, WHOIS server, referral uniform resource locator (URL), the name, telephone number, and e-mail address of all the registrar's administrative, billing, and technical contacts. Optionally, some registrars provide dedicated contact data to deal with abusive domains and other legal processes.

Operational Data Set: These data are needed for the on-going operation and maintenance of the domain name by the registrar or the registry. Operational data sets include the following:

1. **Domain:** domain name, registrar ID (if applicable), updated date, creation date, expiration date, and status information.
2. **Name server:** data for name servers consisting of server name, Internet Protocol (IP) addresses (IP versions 4 and 6), registrar ID (if applicable), updated date, creation date, expiration date, and (client and server) status information.
3. **DNS Security Extensions (DNSSEC):** If the domain is signed, the DNSSEC-related material necessary for the TLD zone to manage the domain, e.g., the DNSKEY or DS resource record information.
4. **Optional;** Examples of data in this set could include reseller information, trademark information for the domain (e.g., name of the registered mark, registration number, registration locality)⁷ or charter eligibility requirements that would require applicants to provide additional information to satisfy requirements for eligibility to register a domain name in the registry.⁸

Contact data sets are typically initially collected at the time of registration but all data elements may only be collected when needed and updated when necessary.

⁶ Current contact data sets do not consider more recently adopted “social media” contacts. An extensible model for domain name registration data accommodates the inclusion of social media identifiers should such contact information be adopted through a consensus policy process.

⁷ An example of the trademark information can be found in .ASIA WHOIS output (whois nic.asia), the description of this information can be found in .ASIA’s sunrise policies, <<http://dotasia.org/policies/DotAsia-Sunrise-Addendum--COMPLETE-2007-10-25.pdf>>.

⁸ For an example of charter eligibility requirement, see .ASIA’s requirement at <<http://dotasia.org/policies/DotAsia-Charter-Eligibility--COMPLETE-2010-09-01.pdf>>.

3.2 Update

Update is an operation whereby the entity that is responsible for managing a domain name registration replaces information previously associated with the domain name with new information (collected from the registrant, a competent authority, or the registration provider). Registry policies differ on what update operations are permitted. A typical update would include the action to add or remove a resource or the action to change the content of an existing resource.

If the update operation requires data that were not collected at the time of registration, such data elements would be collected at the time of the update.

3.3 Renewal

A registrant is given the opportunity to renew a registered domain before the term of registration expires (or in some cases during the expiration and grace period). As part of the renewal, new billing information may be needed, and existing information about the domain, registrant, and name server may be updated.

3.4 Transfer

Transfer is an operation whereby the registrant or a competent authority changes the party that manages the domain name registration. The Inter Registrar Transfer Process (IRTP) is an example of a transfer operation.⁹ The domain transfer data set includes:

- Losing registrar
- Gaining registrar
- Auth ID
- Domain
- Domain expiration

Another type of transfer relates to the ownership of the domain. In this case, the day-to-day control of the domain is transferred to another individual or company. Both the record of ownership on the registration data and the person authorized to make changes to the domain are to be changed. The contact information for the new owner of the domain is collected. Transfer of ownership often results in updates to other information such as hosting information.

⁹ See Internet Corporation for Assigned Names and Numbers (ICANN). (2011) *Policy on Transfer of Registrations between Registrars*. Marina Del Rey, CA: ICANN. Retrieved May 17, 2012, <<http://www.icann.org/en/registries/agreements.htm>>.

3.5 Deletion

Deletion is the operation by which the entity responsible for managing a domain name (registrar or registry) initiates the actions necessary to remove an instantiated label from a registrar or registry. Deletion requests are made by the registrant of the domain name or by a competent authority. In order for the deletion to complete, the primary key of the record (e.g. the domain name) is needed. Once the main domain name is deleted, the associated operational data is also removed. Since this information is already collected, no new data are needed for the deletion of the domain name.

4. Domain Name Registration Data Model

In this section the SSAC proposes a DNRD Model for consideration. In the following tables “Long Name” and “Short Name” refer to labels used to identify individual datum. “Description” characterizes the data identified using the associated labels. The textual representation and description are useful to characterize the data objects in the set. The data are organized into the following groups: contact, domain, name server, registrar, and DNSSEC. Note that the internationalization of certain elements of this data model will be accommodated in technical specifications of the data model and data profiles (i.e., an object notation or meta language will include tags for {language, script, country...} as determined through consensus policy).

This document contains an enumeration of commonly used data elements. It is not a list or recommendation of which elements are or should be mandatory versus optional. Some technical specifications (notably the Extensible Provisioning Protocol (EPP) RFCs) denote certain data elements as mandatory to collect, and ICANN gTLD contracts make certain fields mandatory to display in directory services (“WHOIS services,” in the nomenclature used prior to SAC051).

Table 1: Data Model for Contact

Long Name	Short Name	Description
Contact ID	id	The unique identifier assigned to the contact when it was created.
Contact Status	status	Current status associated with the contact.
Contact Name	name	The name of the individual or role represented by the contact.
Contact Organization	org	The name of the organization with which the contact is affiliated.
Contact Street	street	One, two, or three elements that contain the contact's street address.
Contact City	city	The contact's city..

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Contact State / Province	sp	The state or province for the contact
Contact Country Code	cc	The two letter country code for the contact.
Contact Phone Number	voice	The contact's voice telephone number.
Contact Facsimile Number	fax	The contact's facsimile telephone number.
Contact Email	email	The contact's email address.
Contact Sponsoring Registrar ID	registrarid	The identifier of the sponsoring registrar for the contact.

Table 2: Registrar Data Model

Long Name	Short Name	Description
Registrar ID	registrarid	The unique identifier of the registrar object.
Registrar Street	street	One, two, or three elements that contain the registrar's street address.
Registrar City	city	The registrar's city.
Registrar State / Province	sp	The state or province for the registrar.
Registrar Country Code	cc	The two letter country code for the registrar.
Registrar Phone Number	voice	The registrar's voice telephone number.
Registrar Facsimile Number	fax	The registrar's facsimile telephone number.
Registrar Email	email	The registrar's email address.
Registrar Organization	org	The name of the organization with which the registrar is affiliated.
Registrar WHOIS Server	whoisinfo	The WHOIS server address for the registrar,
Registrar URL	url	The registrar's URL.
Registrar Additional Contact	contact	One or more elements that contain identifiers for the human or organizational social information objects associated with the registrar, e.g. abuse contacts at a registrar.
Registrar Creation Date	crDate	The date and time of the registrar creation.

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Registrar Update Date	upDate	The date and time of the most recent registrar-modification.
Registrar Authorization Information	authInfo	An element that contains authorization information associated with the registrar object to allow access to registry systems.

Table 3: Host Name Data Model

Long Name	Short Name	Description
Host ID	id	The repository object identifier assigned to the host when it was created.
Host Name	name	The fully qualified name of the host.
Host Status	status	Current status descriptors associated with the host.
Host IP Address	addr	The IPv4 or IPv6 addresses associated with the host object
Sponsoring Registrar ID	registrarid	The identifier of the sponsoring registrar.
Host Creation Date	crDate	The date and time of the host creation.
Host Update Date	upDate	The date and time of the most recent update to the host

Table 4: Domain Name Data Model

Long Name	Short Name	Description
Domain Name	name	The fully qualified name of the domain name.
Domain ID	id	The repository object identifier assigned to the domain name object when it was created.
Domain Status	status	Current status descriptors associated with the domain name.
Registrant ID	registrant	Identifier for the human or organizational social information object (as identified in Table 1) associated as the holder of the domain name object
Technical Contact ID	tech	Identifiers for the technical contact associated with the domain name.
Administrative Contact ID	admin	Identifiers for the administrative contact associated with the domain name.
Reseller	Reseller	Information about reseller where applicable.

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Name Server	ns	Fully qualified names of the delegated host objects or host attributes (name servers) associated with the domain name object.
Host	host	The fully qualified names of the subordinate host objects that exist under this superordinate domain name object.
Sponsoring Registrar ID	registrarid	The identifier of the sponsoring registrar.
Creation Date	crDate	The date and time of the domain name object creation.
Updated Date	upDate	The date and time of the most recent domain name object modification.
Registry Expiry Date	exDate	The date and time identifying the end (expiration) of the domain name object's registration period.

Table 5: Registered Mark Information Data Model

Long Name	Short Name	Description
Domain ID	Id	The domain id as maintained by the registry.
Registered Mark	Name	The registered mark owned by the registrant.
Registration Number	Number	The registration or the serial number of the registered mark.
Registration Locality	ccLocality	Location where the right is established for the registered mark.
Application Date	appDate	Date the registered mark was applied for.
Registration Date	regDate	Date the mark was registered.
Registered Class	Class	Number of the Class of the mark according to the Nice Classification System ¹⁰ .
Entitlement	Entitlement	Whether the Applicant (corresponding to the Registrant Contact) holds the registered mark as the original "OWNER", "CO-OWNER" or "ASSIGNEE".

¹⁰ See World Intellectual Property Organization. "International Classification of Goods and Services under the NICE Agreement." 10th Edition, <<http://www.wipo.int/classifications/nivilo/nice/index.htm?lang=EN>>.

Sunrise Phase	Type	Phases eligible for sunrise registration.
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Table 6: DNSSEC Information Data Model

Long Name	Short Name	Description
Domain ID	Id	The domain id as maintained by the registry.
DS Key Tag	keyTag	key tag value as described in section 5.1.1 of RFC 4034.
Algorithm	Alg	algorithm value as described in section 5.1.2 of RFC 4034.
Digest Type	digestType	A digest type value as described in section 5.1.3 of RFC 4034.
Digest Value	digest	A digest value as described in section 5.1.4 of RFC 4034.
DS Maximum Signature Life	maxSingLife	An element that indicates a child's preference for the number of seconds after signature generation when the parent's signature on the DS information provided by the child will expire.
DS Key Data	keyData	An element that describes the key data used as input in the DS hash calculation. The key data contains additional elements such as flag, protocol, algorithm, and public key as specified in sections 2.1.1-2.1.4 of RFC 4034.

5. Profiling the Data Model

The data model depicted in this document can be seen as a glossary of the potential elements that would be used by a domain name registry, registrars, registrants, etc. during the lifecycle of a domain name. However, the data model is an abstract construct not usable per se. What would be usable in implementations are profiles of the data model.

A data profile (e.g. profile for DNRD-DS, profile for Registry Data Escrow) typically contain the following elements:

- **Data elements:** this is typically a subset of the elements from the data model.
- **Attributes:** these are attributes for the profile elements. Example attributes include format (e.g., International Telecommunications Union Telecommunications Standardization Sector (ITU-T) E.123 standard for telephone numbers, or RFC 5322 for email addresses), minimum and/or maximum length (e.g., 63 code points), language tag as defined by some specification (e.g., RFC 5646), output labels, and cardinality (e.g., whether you

can have 1, two or more elements). Additional parameters may be included in the profile depending on the intended use.

- **Profile Parameters:** this would include character encoding (e.g., UTF-8), the markup language (e.g., Extensible Markup Language (XML), JavaScript Object Notation (JSON, plain text), or the protocol used to access the data (e.g., WHOIS, EPP, Escrow)
- **Additional Profile rules:** such rules could include “a domain name has to be linked with exactly three contacts: administrative, technical, and billing.”

A profile of the data model would be defined/used in relation to a registry or set of registries and a related service. For example, the registry for the TLD .mx could create a profile for its directory service (WHOIS). The same registry can have a different profile for a different service. In the same manner a profile for a service could be shared between a set of registries. In fact, the use of common data objects across multiple data profiles is beneficial for application development as it allows the use of common (libraries) software sources.

As an illustration, Appendix A includes an example of what a typical gTLD registry DNRD-DS profile might look like.

6. Findings

Finding 1: It is possible to use the life cycle of a domain name to enumerate data elements that are necessary to manage the events in that life cycle.

Finding 2: Many of these data elements exist today in data models used by ICANN, TLD registries and registrars. Recognizing that some registries have special requirements (e.g., certain gTLDs) or additional requirements mandated by other third parties (e.g., ccTLDs) we have included those data elements that we know about. In addition, an extension mechanism is available so that other data elements that may be needed by other TLDs can also be specified.

Finding 3: Establishing a common understanding of and appreciation for the creation and submission aspects of domain name registration data are an important component for the definition of directory services in general, and the acceptance and approval of a common data model (and along with it, adoption of structured data) are important steps toward reducing variability.

7. Recommendations

Recommendation 1: The SSAC invites all ICANN Supporting Organizations and Advisory Committees, and in particular Registry and Registrar Stakeholder groups to (a) consider this data model and comment on its completeness, and (b) comment on the utility of the model in furthering the definition of a directory service for domain name registration data as outlined in SAC033 and SAC051.

Recommendation 2: The SSAC encourages the community to adopt the labeling and terminology used in this data model in future work.

8. Acknowledgments, Statements of Interests, and Objections and Withdrawals

In the interest of greater transparency, these sections provide the reader information on three aspects of our process. The Acknowledgments section lists the members who contributed to this particular document. The Statements of Interest section points to the biographies of the Committee members and any conflicts of interest, real, apparent or potential, that may bear on the material in this document. The Objections and Withdrawals section provides a place for individual members to disagree with the content of this document or the process for preparing it.

8.1 Acknowledgments

The committee wishes to thank the following SSAC members and external experts for their time, contributions, and review in producing this Report.

SSAC members

Greg Aaron
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8.2 Statements of Interest

SSAC member biographical information and Statements of Interest are available at:
<http://www.icann.org/en/groups/ssac/biographies-08may12-en.htm>.

8.3 Objections and Withdrawals

There were no objections or withdrawals.

9. References

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11. ICANN Security and Stability Advisory Committee (SSAC). (2011) *SSAC Report on Domain Name WHOIS Terminology and Structure* (SSAC publication No. 051). Retrieved from <http://www.icann.org/en/committees/security/sac051.pdf>

Appendix A: Example Profile For A Typical gTLD DNRD-DS

For this data profile, the SSAC show a typical gTLD registry DNRD-DS profile might appear. The SSAC chose gTLDs as an example because all of them have contracts with ICANN and their DNRD-DS is specified in their contracts.

Profile Rules: (this section should be developed by the relevant policy communities)

- The profile should be separated into the following objects: domain, contact, registrar and name server.
 - o The **domain object** corresponds to a single Registered Name. Each domain object includes the following data: Domain ID, Domain Name, Sponsoring Registrar, Domain Statuses, all contact information (including all details) with at least one each of: Registrant, Administrative, Technical that are instances of the contact object below; All name servers associated with this domain; Domain Registration Date; Domain Expiration Date; Domain Last Updated Date.
 - o The **contact object** corresponds to a single contact (registrant, administrative, technical are roles of a contact with respect to given domain name). The contact object includes the following data: Contact ID, Contact Name, Contact Organization, Contact Address, City, State/Province, Country, Contact Postal Code, Contact Phone, Fax, E-mail.
 - o The **registrar object** corresponds to a single registrar. It includes the following data: Registrar ID (conforming to the IANA registrar-ids registry), Contact ID of Registrar, Registrar Administrative Contact ID, Registrar Technical Contact ID, Registrar URL, Registrar Creation Date, and Registrar Last Updated Date.
 - o A **name server object** corresponds to a single registered name server. The name server object includes the following data: Name Server ID, Name Server Host Name, Name Server IP Addresses if applicable, Current Registrar, Name Server Creation Date, Name Server Last Updated Date.
- Relevant technical standards should be applied for each of the data elements enumerated above as explained below.

Example Profile Parameters:

- **Markup Language:** The markup language for the profile should be XML.
- **Encoding:** The encoding is UCS Transformation Format — 8-bit (UTF-8.)

Example Profile Description:

Table 1: DNRD-DS Profile For the Domain Element

Data Element	Output Label	Format	Min length	Max length	Cardinality	Language Tag (RFC 5646)
	Domain Name	RFC 1034	1	63	1	n/a
	U-label	RFC 5890	1	16	{0,1}	
	Domain ID		1	255	1	n/a
	WHOIS Server	RFC 1123	1	255	1	n/a
	Referral URL	RFC 3986	1	255	1	n/a
	Updated Date	RFC 3339 ¹¹		32	{0,1}	n/a
	Creation Date	RFC 3339		32	1	n/a
	Registry Expiry Date	RFC 3339		32	1	n/a
	Sponsoring Registrar IANA ID	Registrar ID registry ¹²	1	255	1	n/a
	Domain Status	Exact EPP code		32	{1,4}	n/a
	Registrant ID		1	255	1	n/a
	Admin ID		1	255	1	n/a
	Tech ID		1	255	1	n/a

¹¹ Date and time in UTC as specified in [RFC3339], with no offset from the zero meridian.

¹² The Registry is available at: <<http://www.iana.org/assignments/registrar-ids/registrar-ids.xml>>.

Table 2: DNRD-DS Profile For the Nameserver Element

Data Element	Output Label	Format	Min length	Max length	Cardinality	Language Tag (RFC 5646)
	Nameserver ID		1	255	1	n/a
	Host Name	RFC 1123	1	255	1	n/a
	IP Address	RFC 0791/RFC 5952			{0, ..}	n/a
	Sponsoring Registrar		1	255	1	n/a
	Referral URL	RFC 3986	1	255	1	n/a
	Creation Date	RFC 3339		32	1	n/a
	Last Updated Date	RFC 3339		32	{0,1}	n/a
	WHOIS Server	RFC 1123	1	255	1	n/a

Table 3: DNRD-DS Profile For the Contact Element

Data Element	Output Label	Format	Min length	Max length	Cardinality	Language Tag (RFC 5646)
	Contact ID		1	255	1	n/a
	Contact Name		1	255	{0,1}	required
	Contact Organization		1	255	{0,1}	required
	Contact street		1	255	1	required
	Contact City		1	255	1	required
	Contact State / Province		1	255	1	required
	Contact country	ISO 3166-1 alpha-2	2	2	1	n/a
	Contact Postal Code		1	255	1	n/a
	Contact Phone	ITU E 164		64	1	n/a

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	Contact Fax	ITU E 164		64	{0,1}	n/a
	Contact Email	RFC 5322		255	1	n/a

Table 4: DNRD-DS Profile For the Registrar Element

Data Element	Output Label	Format	Min length	Max length	Cardinality	Language Tag (RFC 5646)
	Registrar ID		1	255	1	n/a
	Contact Organization		1	255	{0,1}	required
	Contact street		1	255	{1,3}	required
	Contact City		1	255	1	required
	Contact State / Province		1	255	1	required
	Contact country	ISO 3166- 1 alpha- 2	2	2	1	n/a
	Contact Postal Code		1	255	1	n/a
	Contact Phone	ITU E 164		64	1	n/a
	Contact Fax	ITU E 164		64	1	n/a
	Contact Email	RFC 5322		255	1	n/a
	Registrar Admin Contact ID		1	255	1	n/a
	Registrar Technical Contact ID		1	255	1	n/a
	Registrar WHOIS Server	RFC 1123	1	255	1	n/a
	Registrar URL	RFC 3986	1	255	{0,1}	n/a

Example Profile Implementation:

Examples of Domain Name Object in XML

```
<domain>
  <name>pinguino.test</name>
```

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```
<roid>Dpinguino-TEST</roid>
<status s="pendingDelete"/>
<rgpStatus s="redemptionPeriod"/>
<registrant>jd1234</registrant>
<contact type="admin">sh8013</contact>
<contact type="tech">sh8013</contact>
<ns>
  <domain:hostObj>ns1.example.com</domain:hostObj>
  <domain:hostObj>ns1.example.net</domain:hostObj>
</ns>
<host>ns1.pinguino.test</host>
<host>ns2.pinguino.test</host>
<clID>clientX</clID>
<crID>clientY</crID>
<crDate>1999-04-03T22:00:00.0Z</crDate>
<upID>clientX</upID>
<upDate>2009-12-03T09:05:00.0Z</upDate>
<exDate>2015-04-03T22:00:00.0Z</exDate>
<authInfo>
  <domain:pw>2fooBAR</domain:pw>
</authInfo>
<secDNS>
  <secDNS:maxSigLife>604800</secDNS:maxSigLife>
  <secDNS:dsData>
    <secDNS:keyTag>12345</secDNS:keyTag>
    <secDNS:alg>7</secDNS:alg>
    <secDNS:digestType>1</secDNS:digestType>
    <secDNS:digest>
      93358db22e956a451eb5ae8d2ec39526ca6a87b9
    </secDNS:digest>
  </secDNS:dsData>
</secDNS>
<trnData>
  <trStatus>pending</trStatus>
  <reID>clientW</reID>
  <reDate>2011-03-08T19:38:00.0Z</reDate>
  <acID>clientX</acID>
  <acDate>2011-03-13T23:59:59.0Z</acDate>
  <exDate>2016-04-03T22:00:00.0Z</exDate>
</trnData>
</domain>
```

Examples of Host Name Object in XML

```
<host>
  <name>ns1.example.test</name>
  <roid>Hns1_example_test-TEST</roid>
```

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```
<status s="linked"/>
<status s="clientUpdateProhibited"/>
<addr ip="v4">192.0.2.2</addr>
<addr ip="v4">192.0.2.29</addr>
<addr ip="v6">1080:0:0:0:8:800:200C:417A</addr>
<clID>clientY</clID>
<crID>clientX</crID>
<crDate>1999-05-08T12:10:00.0Z</crDate>
<upID>clientX</upID>
<upDate>2009-10-03T09:34:00.0Z</upDate>
<trDate>2007-01-08T09:19:00.0Z</trDate>
</host>
```

Examples of Contact Object in XML

```
<contact>
  <id>sh8013</id>
  <roid>Csh8013-TEST</roid>
  <status s="linked"/>
  <status s="clientDeleteProhibited"/>
  <postalInfo type="int">
    <contact:name>John Doe</contact:name>
    <contact:org>Example Inc.</contact:org>
    <contact:addr>
      <contact:street>123 Example
Dr.</contact:street>
      <contact:street>Suite 100</contact:street>
      <contact:city>Dulles</contact:city>
      <contact:sp>VA</contact:sp>
      <contact:pc>20166-6503</contact:pc>
      <contact:cc>US</contact:cc>
    </contact:addr>
  </postalInfo>
  <voice x="1234">+1.7035555555</voice>
  <fax>+1.7035555556</fax>
  <email>jdoe@example.test</email>
  <clID>clientY</clID>
  <crID>clientX</crID>
  <crDate>2009-09-13T08:01:00.0Z</crDate>
  <upID>clientX</upID>
  <upDate>2009-11-26T09:10:00.0Z</upDate>
  <authInfo>
    <contact:pw>2fooBAR</contact:pw>
  </authInfo>
  <disclose flag="0">
    <contact:voice/>
    <contact:email/>
  </disclose>
```


SSAC Report on the Domain Name Registration Data Model

```
<trnData>
  <trStatus>pending</trStatus>
  <reID>clientW</reID>
  <reDate>2011-03-08T19:38:00.0Z</reDate>
  <acID>clientX</acID>
  <acDate>2011-03-13T23:59:59.0Z</acDate>
</trnData>
</contact>
```

Examples of Registrar Object in XML

```
<registrar>
  <id>clientX</id>
  <roid>RclientX-TEST</roid>
  <gupid>123</gupid>
  <postalInfo type="int">
    <contact:name>John Doe</contact:name>
    <contact:org>Example Inc.</contact:org>
    <contact:addr>
      <contact:street>123 Example Dr.</contact:street>
      <contact:street>Suite 100</contact:street>
      <contact:city>Dulles</contact:city>
      <contact:sp>VA</contact:sp>
      <contact:pc>20166-6503</contact:pc>
      <contact:cc>US</contact:cc>
    </contact:addr>
  </postalInfo>
  <voice x="1234">+1.7035555555</voice>
  <fax>+1.7035555556</fax>
  <email>jdoe@example.test</email>
  <url>http://www.example.test</url>
  <whoisInfo>
    <name>whois.example.test</name>
    <url>http://whois.example.test</url>
    <url>https://whois.example.test</url>
  </whoisInfo>
  <contact type="admin">rr0013</contact>
  <contact type="tech">rr0012</contact>
  <crDate>2005-04-23T11:49:00.0Z</crDate>
  <upDate>2009-02-17T17:51:00.0Z</upDate>
  <authInfo>
    <contact:pw>tHisaPaSSw</contact:pw>
  </authInfo>
</registrar>
```