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1. Change Request

1.1. Starting the Process

The whole process starts with sending the Registrar DEA Change Request to ICANN. You may download the form from here: Registrar DEA Change Request Form and send it to: registrarupdates@icann.org. Please send us a copy to mailto:escrow@denic-services.de.

The full instructions for the Change process are available on the ICANN website: Registrar Data Escrow Change Process with additional FAQs.

2. Escrow Contract

2.1. How is the agreement concluded?

The contract will be prepared via DocuSign, where it will be signed electronically. Once the documents are completed a PDF document will be sent out. In addition ICANN will receive a copy of the contract.

2.2. What information is needed for the contract?

Following information is needed:

- Full Registrar Operator name
- IANA ID
- Address
- E-Mail-Address
- Phone and Fax
- Contractual partner with position
- E-Mail-Address of Contractual partner
- E-Mail-Address for deposit notifications
- E-Mail-Address for for maintenance information
- Place of jurisdiction

To send the needed information the webform shall be used:

Registrar Data Escrow Details Form or via email to: escrow@denic-services.de.

You can find a template of the agreement here: DENIC Services RDE Agreement Template.
3. Technical Onboarding

3.1. Registrar Data Escrow Account and Credentials

The Registrar Data Escrow Account will be created in the DENIC Services Data Escrow system. Once the account is created, credentials will be sent out via E-Mail, which can be changed in the Customer Service Portal as well. It is recommended to change the password immediately after the first login.

Customer Service Portal  escrow.denic-services.de

These credentials are used for both, SFTP server and the Customer Service Portal.

An example for the credentials look like this:

<table>
<thead>
<tr>
<th>Login: RDE-[your IANA ID] e.g. RDE-9999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password: initial password will be provided by our team</td>
</tr>
</tbody>
</table>
3.2. PGP Key for signing and encrypting deposits

Please provide us your public PGP key through the Customer Service Portal. The key needs to be valid. Your PGP key is necessary for uploading a deposit successfully.

For creating a PGP Key we recommend to use GnuPG:

- [https://gnupg.org](https://gnupg.org) (Linux)
- [https://www.gpg4win.org](https://www.gpg4win.org) (Windows)

Validation period of at least 5 years and length 2048 Bit

**Algorithms**

<table>
<thead>
<tr>
<th>Algorithm</th>
<th>SHA256withECDSA</th>
<th>SHA512withECDSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIPEMD160withRSA</td>
<td>SHA256withECDSA</td>
<td>SHA512withECDSA</td>
</tr>
<tr>
<td>RIPEMD160withECDSA</td>
<td>SHA384withDSA</td>
<td>SHA256withRSA</td>
</tr>
<tr>
<td>RIPEMD256withRSA</td>
<td>SHA384withECDSA</td>
<td>SHA384withRSA</td>
</tr>
<tr>
<td>SHA256withDSA</td>
<td>SHA512withDSA</td>
<td>SHA512withRSA</td>
</tr>
</tbody>
</table>
3.3. SSH Key(s) for automatic login to the SFTP server

Please provide us your public SSH key(s) via the Customer Service Portal. The key(s) need(s) to be valid. We support more than one key if you work with different keys on different servers.

To create a SSH key you may use ssh-keygen at the command line for creating the SSH Key

For example ssh-keygen -t rsa -b 4096

3.4. Deposit preparation

Please prepare your deposit files according to the official ICANN specifications: ICANN RDE Specifications.

3.4.1. Further Instructions on deposit preparation

1. Please see section 4.1.18. Your deposit must be accompanied by a hash file. The hash file must contain the hash sum of the domain files, before the files have been compressed and signed/encrypted. As stated in the specifications:

"Each line shall consist of the hash value for one file, followed by whitespace, followed by the name of the file."

Please note, DENIC requires SHA-256 hash sums. Example of hash.txt data format:
2. All file names must appear in the format specified in section 4.1.21: [IANA ID]_RDE_[YYYY-MM-DD]_[full/inc/hdl/hash]_[#] According to the specifications, your files must be named as follows:

- $account_iana_id_c_RDE_$account_date_modified_full_1.csv
- $account_iana_id_c_RDE_$account_date_modified_hdl_1.csv
- $account_iana_id_c_RDE_$account_date_modified_hash.txt

The "full_1" file must contain the number of the domain records. To comply with the format specified for the use of handles, the header row must appear as follows:

- "domain_name","nameservers","expiration_date","rt_handle","tc_handle","ac_handle","bc_handle"

The "hdl_1" file must contain the complete contact information for each handle ID used for the domains in the "full_1" file. The header row must appear as follows:

- "handle","name","address","state","zip","city","country","email","phone","fax"

In the examples above, a proper abbreviation has been used as stated in Section 4.1.14:

"The first field in the header row shall be the domain name (or handle in the handle definition file). Unambiguous abbreviations may be used. Field names referring to the registrant shall be prefixed with the string 'rt-' (e.g., 'rt-fax'); field names referring to the administrative contact shall be prefixed with the string 'ac-' (as in 'ac-name'); field names referring to the technical contact shall be prefixed with the string 'tc-' (as in 'tc-country'), and field names referring to a billing contact shall be prefixed with 'bc-' (as in 'bc-phone')"

In case you have more than one handle contact in the same role (rt, ac, tc or bc), two different syntaxes are supported:

- Include all handles concatenated with spaces under the regular field name, e.g.:  
  - tc-handle
  - HANDLE1 HANDLE2
- Use separate field names for each handle contact with the syntax roleprefix-N-fieldname, e.g.: tc-1-handle, tc-2-handle

To comply with section 4.1.13, the decimal character has been replaced with the underscore character:
"The header shall clearly designate the data contained within the corresponding fields. Field names in the header row shall be composed of the following characters: lower case 'a' through lower case 'z', upper case 'A' through upper case 'Z', decimal digits '0' through '9', the ASCII underscore character ('_'), and the ASCII hyphen ('-'). Field names must begin with a letter. No other characters are allowed; in particular, embedded spaces, punctuation characters, or other special characters are not allowed."

To comply with section 4.1.6, the field for "contact.tld" has been removed.

To comply with section 4.1.5 and to support delivery of beneficial user information in case of privacy or proxy services, we suggest usage of the following additional fields

"prt_handle","ptc_handle","pac_handle","pbc_handle"

which can be added at the end of the mandatory escrow records. The referenced handles must obviously appear in the handle file.

We strongly recommend to use the aforementioned header field names. Otherwise you are obliged to comply with section 4.1.15. Usage of undocumented header field names may lead to unexpected results in case of an ICANN audit.

3. After you have created your files, the full and hdl files must be compressed first with gzip compression:

Output= $account_iana_id_c_RDE_$account_date_modified_full_1.csv.gz
Output=$account_iana_id_c_RDE_$account_date_modified_hdl_1.csv.gz

4. After the files have been compressed, you must sign and encrypt the compressed files. Please sign first with your private key and then encrypt with DENIC's public key. Signature and encryption should be done in the same pass.

Output= $account_iana_id_c_RDE_$account_date_modified_full_1.csv.gz.gpg
Output= $account_iana_id_c_RDE_$account_date_modified_hdl_1.csv.gz.gpg

5. You must upload all files to your SFTP account with DENIC Data Escrow Services. Please note that the session-close-event is used as a trigger to determine the completeness of the deposit, so make sure to upload all files through the same sftp connection/session.

$account_iana_id_c_RDE_$account_date_modified_full_1.csv.gz.gpg
$account_iana_id_c_RDE_$account_date_modified_hdl_1.csv.gz.gpg
$account_iana_id_c_RDE_$account_date_modified_hash.txt
You have to use our public production key to encrypt the deposit:
DENIC Services RDE public PGP Key.

3.5. Deposit upload to DENIC Services SFTP server

Please use the provided credentials for uploading to our SFTP server.

| FQDN: escrow.denic-services.de |
| Login: RDE-[your IANA ID] e.g. RDE-9999 |
| Password: initial password will be provided by our team |

You may use any SFTP application via terminal or client such as FileZilla:
FileZilla Project.

The number of simultaneous connections has to be set to 1.
In FileZilla it is:
"Transfer Settings" → "Limit number of simultaneous connections" and set to 1.

We strongly recommend using our Escrow RDE Client to upload your deposits.
3.6. Escrow RDE Client

The client takes care of the following tasks:

- Validates the RDE deposits
- Creates hashfile over the content of delivery
- Compresses, encrypt and sign the deposit files
- Uploads the files to the Data Escrow Agent

Important things to remember

- Using the correct credentials and server
- Using the correct PGP keys
- Using the correct SSH
- Using our public production key
  - DENIC Services RDE public PGP Key

You can download the client here: Escrow RDE Client.
3.6.1. Data Escrow RDE Client Manual

Prerequisites

- Your Escrow Agent must have set up your public GPG- and your public SSH-key parts along with your account

The escrow-rde-client will need access to the following files:

- Your private (encrypted) GPG key to sign the deposit files
- Your private SSH key for authentication at the sFTP service
- The public GPG key of the Escrow Agent to encrypt the deposit files

Download the client

Download the client package for your platform (linux/windows) using the links above and extract it to a desired folder.

Prepare the configuration file

- Generate a configuration file with ./escrow-rde-client -i
- rename the generated configuration file to config.yaml (optional)
- edit the parameters in the configuration file

Prepare your deposit files

- to upload a deposit for the current day the source filenames (.csv) can have any filename as long as the name includes full, inc and hdl (denoting full-deposit, incremental deposit and handle file)
- to upload a deposit for any past day, the filenames must follow this convention:

```
<IANAID>_RDE_<YYYY>-<MM>-<DD>_full.csv (or) <IANAID>_RDE_<YYYY>-<MM>-<DD>_inc.csv
<IANAID>_RDE_<YYYY>-<MM>-<DD>_hdl.csv
```

Replace your IANA ID, and year/month/day.

Splitted deposit files

Source files with more than 1 million rows or 1 gigabyte of size need to be splitted into a sequence of files. The consecutive sequence numbers start with 1 and are contained in the filename by the following convention:

```
<IANAID>_RDE_<YYYY>-<MM>-<DD>_full_.csv (or) <IANAID>_RDE_<YYYY>-<MM>-<DD>_inc_.csv
<IANAID>_RDE_<YYYY>-<MM>-<DD>_hdl_.csv
```
The symbol # is replaced by the corresponding sequence numbers. Only the first file should contain row headers, all other files just start with the successive content lines. To enable splitted deposits you need to update your configuration file:

```
multi: true
```

**Run the client**

```
./escrow-rde-client -c config.yaml
```

You can additionally use the -s flag to only print the last validation error message. To print validation output directly to a file, add the following configuration line to your yaml config file:

```
logFile: /path/to/your/log/file
```

**Troubleshooting**

This section discusses some known problems and possible solutions.

**Crashes due to out-of-memory errors**

Out-of-memory errors can cause the application to crash without further error messages. If you run low on memory during computation, consider activating the file system cache in the configuration file:

```
useFileSystemCache: true
```

This will drastically reduce the amount of memory required but also increases computation time.

You can report problems with this tool via e-mail to escrow@denic-services.de

**Example data**

Single-file full deposit, with handle references, `full.csv`. These examples may be splitted according the conventions of multi-file deposits (see above).

```
"domain","ns1","ns2","ns3","ns4","expiration_date","rt-handle","tc-handle","ac-handle","bc-handle","prt-handle","ptc-handle","pac-handle","pbc-handle"
"foobar0.test","ns1.dns.test","ns2.dns.test","ns3.dns.test","ns4.dns.test","2018-05-30 12:30:45Z","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123"
"foobar1.test","ns1.dns.test","ns2.dns.test","ns3.dns.test","ns4.dns.test","2018-08-30T12:30:45Z","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123"
"foobar2.test","ns1.dns.test","ns2.dns.test","ns3.dns.test","ns4.dns.test","2018-05-30T12:30:45Z","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123"
"foobar3.test","ns1.dns.test","ns2.dns.test","ns3.dns.test","ns4.dns.test","2018-05-30T12:30:45Z","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123"
"foobar4.test","ns1.dns.test","ns2.dns.test","ns3.dns.test","ns4.dns.test","2018-05-30T12:30:45Z","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123","foo-123"
```

4. Successful First Deposit

4.1. Successful uploaded to DENIC Services server

When the technical onboarding has been completed you can upload your first deposit to our server. Then we ask you about the planned official starting date after which we start our reporting to ICANN. Remember that we don’t officially report to ICANN prior this date. No report prior to the Transition Notice sent our by ICANN is a valid report for ICANN.

Remember that you have to keep uploading deposits to your old Escrow Agent until the Final Transition Notice from ICANN arrives.

5. Final Transition Notice

5.1. Transition accepted by ICANN

After ICANN validates your successful upload to our servers, they will send you the Final Transition Notice. From that point on we are your official Designated Data Escrow Agent.

You can stop delivering deposits to your old Data Escrow Agent now.

Congratulations!
I - Customer Service Portal

Features

- Credential handling
- Deposit overview
- Statistics
- SLA Information
- Change customer data

Last reported deposits

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FULL deposit, 2018-09-24</td>
<td>24.09.2018</td>
<td>✔</td>
</tr>
<tr>
<td>FULL deposit, 2018-09-21</td>
<td>21.09.2018</td>
<td>✔</td>
</tr>
<tr>
<td>FULL deposit, 2018-09-20</td>
<td>20.09.2018</td>
<td>✔</td>
</tr>
</tbody>
</table>

Data Escrow Agreement

Contract data

Contract 1

- Name: RDEA for members@verifypeopleaccount
- Company signed: 2018-11-28 date
- Customer signed: 2018-11-28 date
- Status: Signed
- Deposit Interval: weekly
- Documents: RDE_Agreement_0997_signed-20181128.pdf

Customer Service Portal escrow.denic-services.de.
II - Contact and Support

<table>
<thead>
<tr>
<th>DENIC Services GmbH &amp; Co. KG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heinrich-Hertz-Str. 6</td>
</tr>
<tr>
<td>64295 Darmstadt</td>
</tr>
<tr>
<td>Germany</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phone</th>
<th>+49-6151-62 92 710</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax</td>
<td>+49-6151-62 92 711</td>
</tr>
<tr>
<td>E-Mail</td>
<td><a href="mailto:escrow@denic-services.de">escrow@denic-services.de</a></td>
</tr>
<tr>
<td>Internet</td>
<td><a href="https://www.denic-services.de/en">https://www.denic-services.de/en</a></td>
</tr>
</tbody>
</table>
III - Additional Information

Links and Resources

- DENIC Services Data Escrow Website
- ICANN Registrar Data Escrow Program
- Registrar Data Escrow Agent Change
- Registrar Data Escrow Agreement Template
- ICANN Registrar Data Escrow Reporting (RRI) FAQ

ICANN Registrar Reporting Interface RRI Codes

<table>
<thead>
<tr>
<th>Result Code</th>
<th>Error Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>No corresponding hash file found for deposit file.</td>
</tr>
<tr>
<td>2002</td>
<td>Hash does not match corresponding deposit file.</td>
</tr>
<tr>
<td>2003</td>
<td>Invalid hash file format.</td>
</tr>
<tr>
<td>2004</td>
<td>Data escrow deposit PGP signature verification error.</td>
</tr>
<tr>
<td>2005</td>
<td>Archive includes unrecognized files.</td>
</tr>
<tr>
<td>2006</td>
<td>Invalid encoding for data escrow deposit file.</td>
</tr>
<tr>
<td>2007</td>
<td>Data escrow deposit file size exceeds maximum allowed size.</td>
</tr>
<tr>
<td>2008</td>
<td>Data escrow deposit file exceeds maximum allowed number of lines.</td>
</tr>
<tr>
<td>2101</td>
<td>Unrecognized data escrow deposit file CSV header.</td>
</tr>
<tr>
<td>2102</td>
<td>Escrow Record structure does not conform with CSV header definition.</td>
</tr>
<tr>
<td>2103</td>
<td>Escrow Record found missing data in required field(s).</td>
</tr>
<tr>
<td>2104</td>
<td>Invalid domain name syntax in Escrow Record.</td>
</tr>
<tr>
<td>2105</td>
<td>Invalid email syntax in Escrow Record.</td>
</tr>
<tr>
<td>2106</td>
<td>Invalid hostname syntax in Escrow Record.</td>
</tr>
<tr>
<td>2107</td>
<td>Invalid date syntax in Escrow Record.</td>
</tr>
<tr>
<td>2108</td>
<td>Invalid phone syntax in Escrow Record.</td>
</tr>
<tr>
<td>2109</td>
<td>Duplicate domain or handle Escrow Record found in deposit.</td>
</tr>
<tr>
<td>2110</td>
<td>Handle reference by Escrow Record not found.</td>
</tr>
<tr>
<td>2201</td>
<td>&quot;Full&quot; data escrow deposit expected but received &quot;Differential&quot; instead.</td>
</tr>
<tr>
<td>2202</td>
<td>Data Escrow deposit date is in the future.</td>
</tr>
<tr>
<td>2203</td>
<td>A data escrow deposit has been already successfully verified for that date.</td>
</tr>
</tbody>
</table>

Further instructions about the RRI can be found here:

ICANN Registrar Interfaces Documentation.