RIPE Database User Manual: Getting Started

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Intended Audience

This document is intended for users who have no previous experience with the RIPE Database. It should give the reader a basic understanding of the following concepts:

- What the RIPE Database is
- How to get information from the RIPE Database
- How to maintain information in the RIPE Database

It is not intended to be a complete reference. Full information on the RIPE Database may be found in the following documents:

- RIPE Database Query Reference Manual [1]
- RIPE Database Reference Manual [2]

Abstract

This is a hands-on tutorial that walks the reader through the basic concepts and techniques that are needed to use the RIPE Database using examples and exercises.

Conventions Used in This Document

We use <label> for a placeholder or to indicate syntax.
We use [option] to indicate an optional text or command argument.
We use a **bold** font to indicate an object type.
We use "attribute:" to indicate an attribute of an object.
"RIPE Database" usually means the interface software rather than the information in the database. Where there may be any doubt, this manual will make clear what is being discussed.

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1.0 The RIPE Database

The RIPE Network Management Database, often called the 'RIPE Database' is a public database that contains information about registered IP address space and AS Numbers, routing policies, and reverse DNS delegations in the RIPE NCC service region. It is used for Internet network management.

1.1 Database Objects

Records in the RIPE Database are called "objects". Each object is a list of "attribute-value" pairs displayed in plain text. An example:

```
person:        John Smith
address:       Example LTD
               High street 12
               St.Mery Mead
               Essex, UK
phone:         +44 1737 892 004
e-mail:        john.smith@example.com
nic-hdl:       JS1-TEST
remarks:       *******************************
remarks:       This object is only an example!
remarks:       *******************************
abuse-mailbox: abuse@example.com
changed:       john.smith@example.com 20051104
source:        TEST
```

This is a **person** object for John Smith. The attributes are "person:", "address:", "phone:" and so on. An attribute name always starts in the first column, and ends with a colon (:). Everything after the colon is the value.

Objects can store information about different resources. For example:

Network Management Resource	Object types
IP Address Ranges	**inetnum, inet6num**
Routing Policies	**aut-num, route, route6**
Reverse DNS Delegations	**domain**
Contact Information	**person, role, organisation**
Authentication Information	**mntner**

1.2 TEST Database

The RIPE NCC provides a TEST Database where users can learn how to use the whois database software. The TEST Database uses the same software as the RIPE Database, but changes in one do not affect the other. The data in the TEST Database is not a copy of the real data in the RIPE Database and is provided purely for learning purposes.

All examples below use the TEST Database. However, all procedures described are the same for the RIPE Database. In section 5.0 Using the Production RIPE Database, we will explain what the differences are when using the RIPE Database. Do not use the production RIPE Database for testing purposes. It is good practice to delete all objects you have created in the TEST Database when you have finished the exercises in this guide.

2.0 How to Get Information from the TEST Database

2.1 Web Queries

The simplest way to get information from the TEST Database is to use the web interface available at:
http://www.ripe.net/perl/test-whois

2.2 Making Simple Queries

To query for a particular object the user specifies its "primary key:". This is an attribute value that identifies a unique occurrence of the object type.

Object Type	Primary Key Attribute	Example Primary Key Value
inetnum	"inetnum:"	193.0.0.0 - 193.0.0.255
inet6num	"inet6num:"	2001:0610:0240::/42
person	"nic-hdl:"	JS1-TEST

Example:

We are going to query for the **person** object with the "nic-hdl:" attribute JS1-TEST. Type the following in the query box:

```
js1-test
```

The reply includes the object in section 1.1 Database Objects. Note that the attribute value is not case-sensitive.

3.0 How to Maintain Information in the RIPE Database

The RIPE Database is used for storing information about Internet resources. You will need to create objects in the database to document your usage of these resources.

Objects in the RIPE Database must reflect the current state of the resources they describe. It is important to modify objects as the details of resources change, or delete objects if resources are no longer used. When IP addresses are assigned to customers, or new staff members are appointed as contacts, it is important to create new objects to reflect this in the database.

You can make updates to the database by using the online update interface (*webupdates*) available at:
https://www.ripe.net/fcgi-bin/webupdates.pl

With *webupdates*, users can directly create, modify or delete database objects using automated processing. After you submit an object update, the screen will return a complete report of the requested operation.

If there were any errors, the update will fail, and the report will describe the reason(s) for this failure. If the error report does not help you resolve the problem, you can send a copy of it to <ripe-dbm@ripe.net>. A RIPE NCC customer support representative will help you resolve the problem.

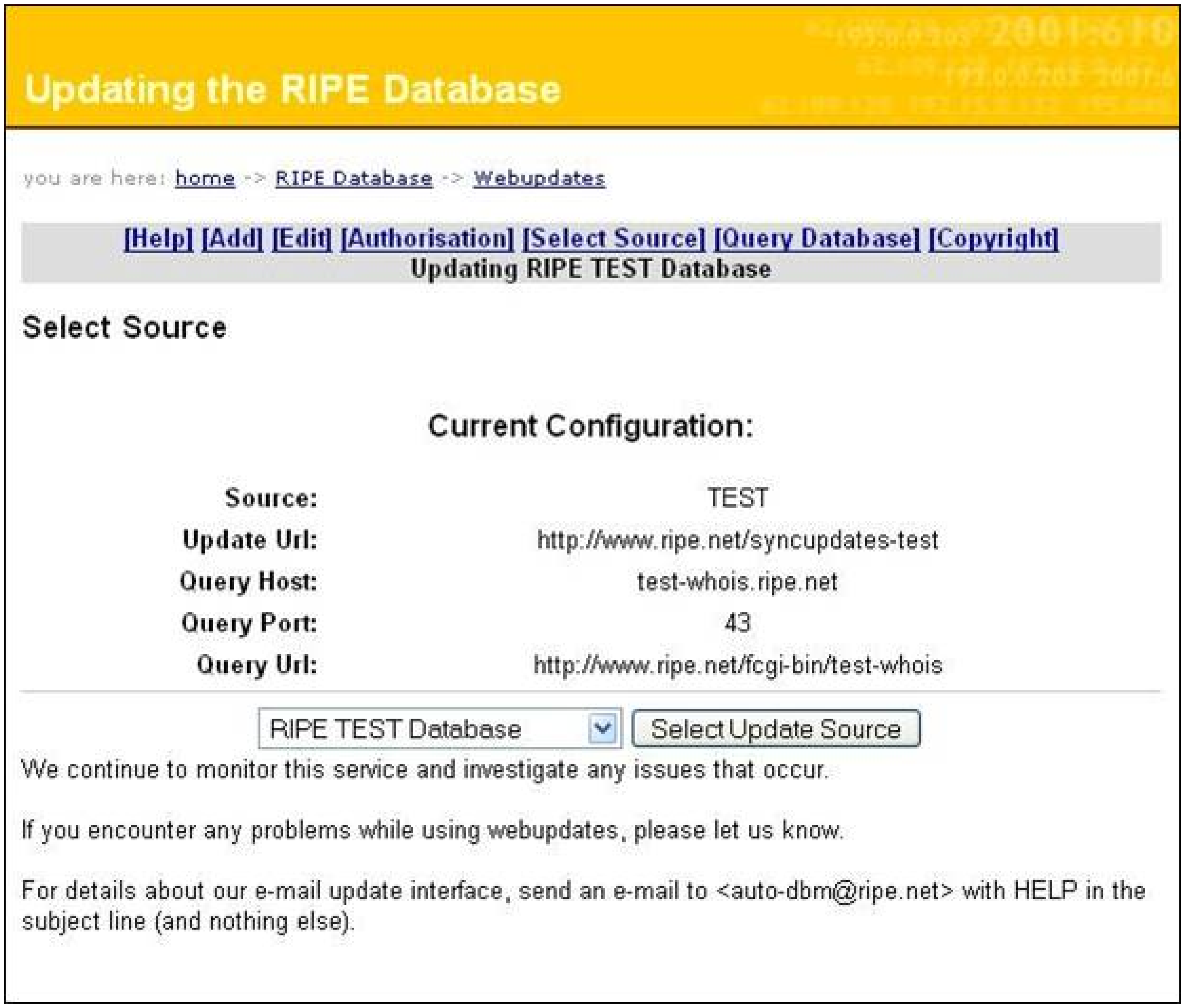
The following sections describe the process of creating and maintaining objects in the TEST Database. By the end of this document, you will have learned how to create and protect an object representing a network assignment.

3.1 Selecting the Database

Throughout much of this document, you will learn how to perform modifications using the TEST Database. Before each update is performed, you need to select the TEST Database as source in *webupdates*.

To select the TEST Database as source, go to:
https://www.ripe.net/fcgi-bin/webupdates.pl

Click **[Select Source]** in the header of *webupdates*:


Updating the RIPE Database

you are here: home -> RIPE Database -> Webupdates

[Help] [Add] [Edit] [Authorisation] [Select Source] [Query Database] [Copyright]
Updating RIPE TEST Database

Select Source

Current Configuration:

Source:	TEST
Update Url:	http://www.ripe.net/syncupdates-test
Query Host:	test-whois.ripe.net
Query Port:	43
Query Url:	http://www.ripe.net/fcgi-bin/test-whois

RIPE TEST Database | Select Update Source

We continue to monitor this service and investigate any issues that occur.

If you encounter any problems while using webupdates, please let us know.

For details about our e-mail update interface, send an e-mail to <auto-dbm@ripe.net> with HELP in the subject line (and nothing else).

2. Select "RIPE TEST Database" from the list and press **Select Update Source**.

3.2 Creating Objects

The **inetnum** object contains information about registered IP address space; this includes the range of addresses, status and responsible contacts.

Before this object can be created in the database, you must first create some preliminary objects. These objects contain information that is referenced by the **inetnum** object. This requires the creation of the following objects:

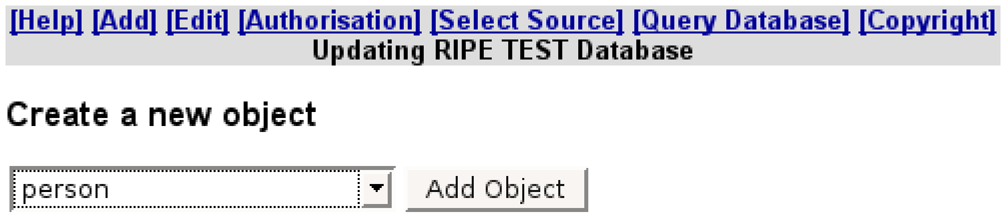
- A **person** object that contains information about the administrative and technical contacts for this network. This is referenced from the "admin-c:" and "tech-c:" attributes of the **inetnum** object.

- A **mntner** object that contains authentication information that identifies who can modify the contents of this object. This is referenced from the "mnt-by:" attribute of the **inetnum** object. The **mntner** object protects the **inetnum** object.

3.3 Registering Contact Information

Contact information, such as a phone number and e-mail address, is stored in the **person** object. To create a new **person** object in the database:

1. Select the TEST Database as your update source. We tell you how to do this in section 3.1 Selecting the Database.
2. Click on the **[Add]** option (in the header of *webupdates*) to create a new object in the TEST Database and select object type: "**person**":


[Help] [Add] [Edit] [Authorisation] [Select Source] [Query Database] [Copyright]
Updating RIPE TEST Database
Create a new object
person
Add Object

3. Click on **Add Object**.
4. In the next screen, enter the information for the attributes of the object that you are creating.

An attribute has two main characteristics:

- **Mandatory/Optional –** If an attribute is mandatory, it must always be present in any object of that type that is stored in the RIPE Database. If it is optional, you can leave it out.

- **Single/Multiple –** If an attribute is single, then only one attribute of that type can be present in an object. If it is multiple, the object can contain more than one instanceof the same attribute.

Note: To see the full template of an object type including the characteristics of all its attributes, you can query the database for: *"-t [object type]"*.

Example:

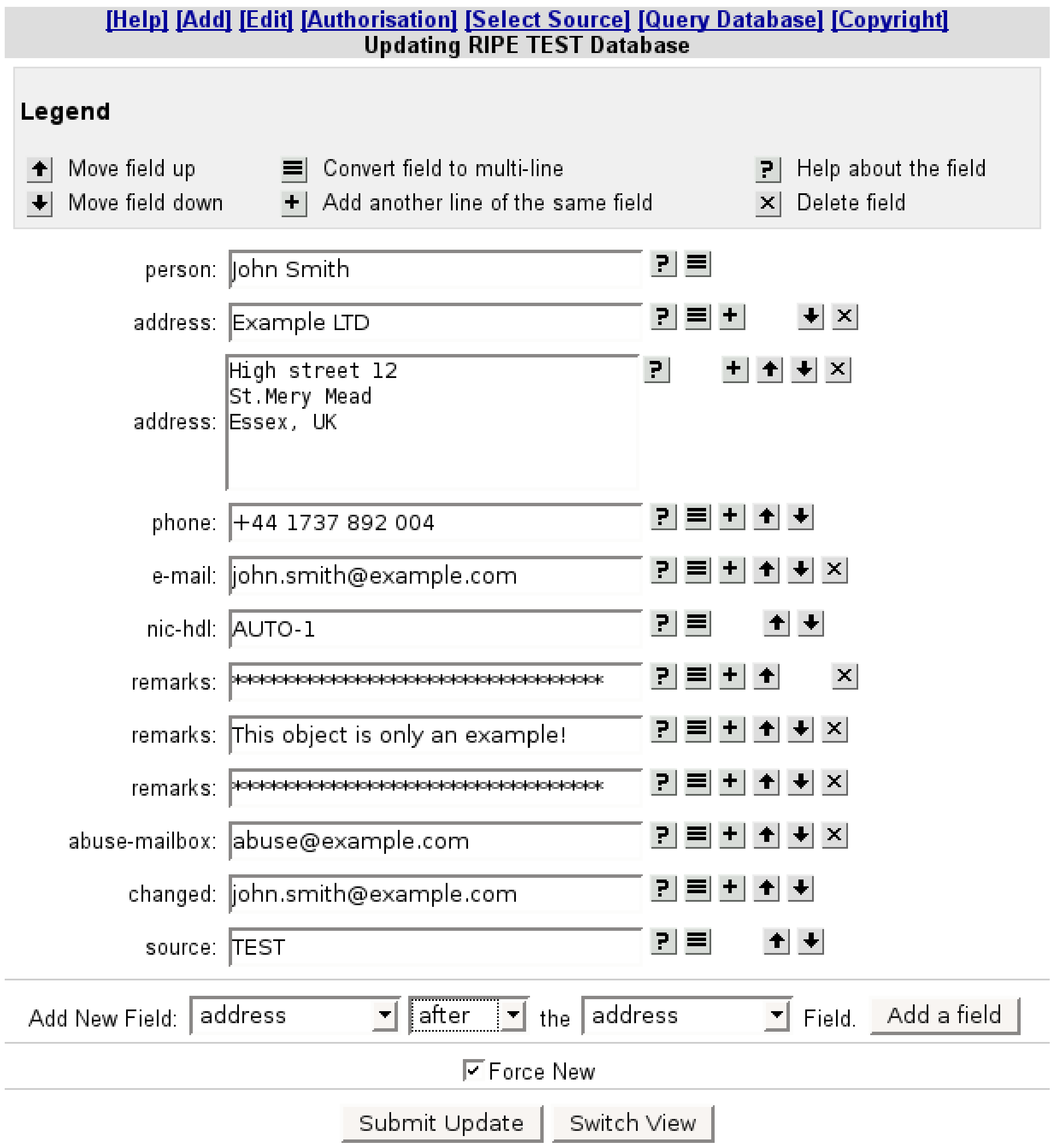
Click on **[Query Database]** and enter:

```
-t person
person:         [mandatory]  [single]     [lookup key]
address:        [mandatory]  [multiple]   [ ]
phone:          [mandatory]  [multiple]   [ ]
fax-no:         [optional]   [multiple]   [ ]
e-mail:         [optional]   [multiple]   [lookup key]
org:            [optional]   [multiple]   [inverse key]
nic-hdl:        [mandatory]  [single]     [primary/look-up key]
remarks:        [optional]   [multiple]   [ ]
notify:         [optional]   [multiple]   [inverse key]
abuse-mailbox:  [optional]   [multiple]   [inverse key]
mnt-by:         [optional]   [multiple]   [inverse key]
changed:        [mandatory]  [multiple]   [ ]
source:         [mandatory]  [single]     [ ]
```

When creating a new object with *webupdates*, only the mandatory attributes are shown automatically. You can add optional attributes and/or other instances of multiple attributes by using the **Add New Field** section.

Return to the *webupdates* screen and prepare a **person** object to be created in the TEST Database.

Use "AUTO-1" for the "nic-hdl:" attribute, your e-mail address for the "changed:" attribute, and "TEST" for the "source:" attribute.


[Help] [Add] [Edit] [Authorisation] [Select Source] [Query Database] [Copyright]

Updating RIPE TEST Database

Legend

Move field up	Convert field to multi-line	Help about the field
Move field down	Add another line of the same field	Delete field

```
person:        John Smith
address:       Example LTD
address:       High street 12
               St.Mery Mead
               Essex, UK
phone:         +44 1737 892 004
e-mail:        john.smith@example.com
nic-hdl:       AUTO-1
remarks:       ********************************
remarks:       This object is only an example!
remarks:       ********************************
abuse-mailbox: abuse@example.com
changed:       john.smith@example.com
source:        TEST
```

Add New Field: address after the address Field.

[✓] Force New

By checking the **Force New** box, you guarantee that the object is only created if it does not already exist in the database. We recommend that you keep this option checked, to avoid accidentally modifying an existing object.

5. When you have finished setting up the object, press **Submit Update**.
6. Wait for an acknowledgement from the TEST Database to appear on your screen. This may take some time to complete. Here is an example of the type of message you will see, if your update is successful:

```
Create SUCCEEDED: [person] JS1-TEST John Smith
***Warning: Date '20051104' added to changed:
attribute 'john.smith@example.com'
```

Note: The text after the [**person**] tag (JSI-TEST) is the NIC handle of the person. It replaces the AUTO-1 value of the "nic-hdl:" attribute in the original submission. It will be unique and is the primary key of this **person** object. Any references to this **person** object will use this NIC handle.

You can use the new NIC handle value to query for this object. If you do this, you can also see that the "changed:" attribute has had the date of the creation added. This is normal behaviour and is the reason for the "***Warning:" message in the example above.

If there was an error, the acknowledgement will tell you that the update has failed and will also report any errors. For example, it may contain the following:

```
Update FAILED: [person] AUTO-1 John Smith
***Error: Syntax error in object
```

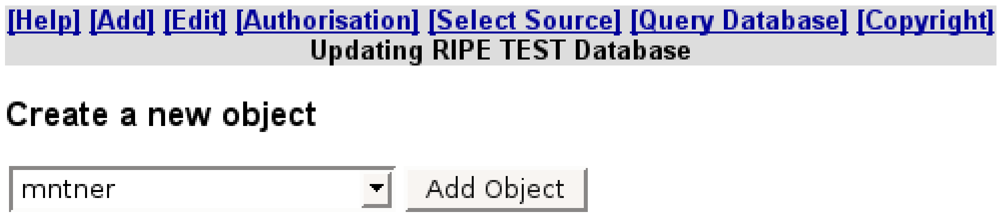
This message means that the update failed because of a problem with the syntax in the object. Check for invalid attribute values to find the cause of the error.

3.4 Registering Authentication Information

"Authentication" is when you prove that you have the right to modify this object. This information prevents other users from modifying your data. In the database, the information that verifies authentication is stored in the **mntner** object (also called the maintainer object).

To create a new **mntner** object in the database, do the following:

1. As with the creation of your **person** object, choose the TEST Database as update source, and then select **mntner** from the object list in the **[Add]** section:


[Help] [Add] [Edit] [Authorisation] [Select Source] [Query Database] [Copyright]
Updating RIPE TEST Database
Create a new object
mntner
Add Object

2. Set up your **mntner** object using *webupdates*. Follow the same steps that you used previously for the **person** object.

Note: For any object type, you can get the object's template with a detailed description of the meaning and syntax of each allowed attribute, by querying for: "-v [object type]".

To get a full description of all the **mntner** object's fields, query the RIPE Database for:

```
-v mntner
```

Check the syntax definition for the "mntner:" attribute field, when choosing your own **mntner** name:

```
A unique identifier of the mntner object.
Made up of letters, digits, the character
underscore "_", and the character hyphen
"-"; the first character of a name must
be a letter, and the last character of a
name must be a letter or a digit.
```

For the "admin-c:" and "tech-c:" attributes, you should use the value of the "nic-hdl:" from the **person** object that you created earlier in this tutorial. The database will not allow you to create a **mntner** object unless this **person** object already exists.

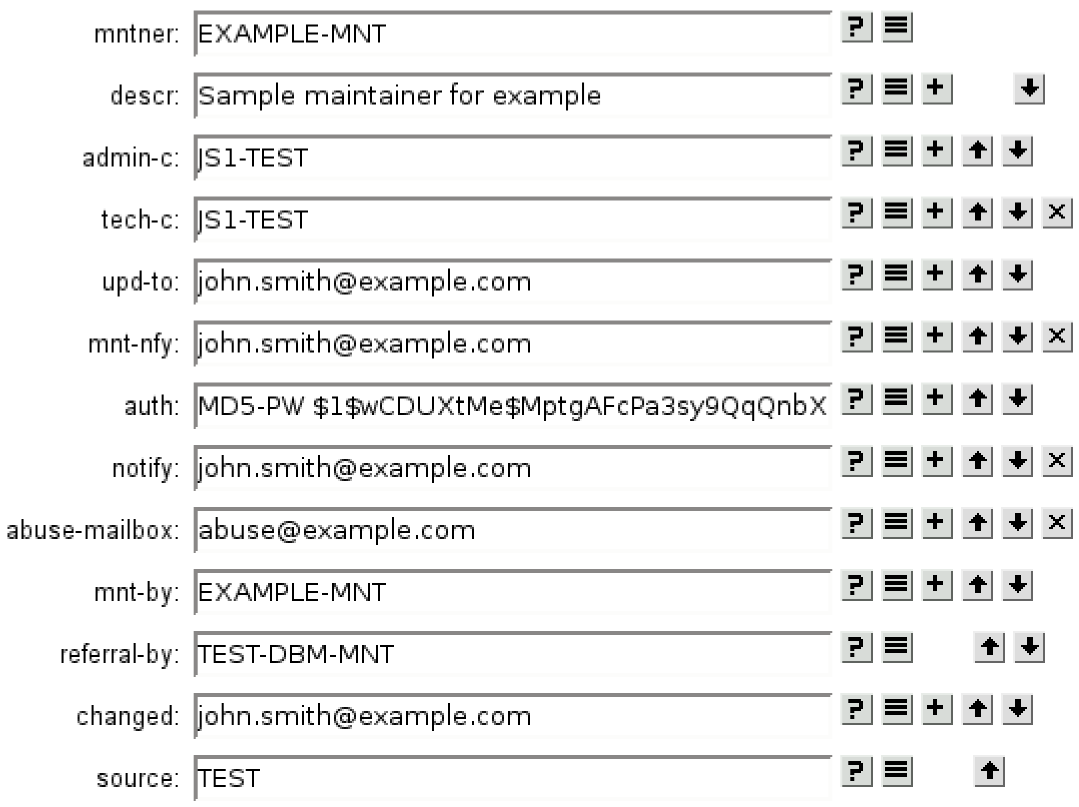
The "auth:" attribute begins with a keyword identifying the authentication method. This is followed by the authentication information.

A password is used to authenticate database updates in the example below. To encrypt your password using MD5-PW, you can use this web tool:
https://www.ripe.net/cgi-bin/crypt.cgi

Here is an example of an "auth:" attribute using an MD5 encrypted password:
```
auth: MD5-PW $1$9KZv4vZf$zD8GoM7Ppvc74ypGmjedt/
```

The "mnt-by:" attribute refers to the **mntner** that is authorised to perform updates on an object. The **mntner** object usually maintains itself, so use your maintainer name (the value of the "mntner:" attribute) in the "mnt-by:" attribute.

Use "TEST-DBM-MNT" in the "referral-by:" attribute.



mntner:	EXAMPLE-MNT
descr:	Sample maintainer for example
admin-c:	JS1-TEST
tech-c:	JS1-TEST
upd-to:	john.smith@example.com
mnt-nfy:	john.smith@example.com
auth:	MD5-PW $1$wCDUXtMe$MptgAFcPa3sy9QqQnbX
notify:	john.smith@example.com
abuse-mailbox:	abuse@example.com
mnt-by:	EXAMPLE-MNT
referral-by:	TEST-DBM-MNT
changed:	john.smith@example.com
source:	TEST

3. When you have finished composing the object, press **Submit Update**.

4. Wait for an acknowledgement from the TEST Database to appear on your screen. This may take some time to complete. Here is a sample of the type of message you will see, if your update is successful:

```
Create SUCCEEDED: [mntner] EXAMPLE-MNT
```

If there was an error, correct the faulty attribute value(s) and re-submit the update.

5. The e-mail address in the "mnt-nfy:" attribute of the **mntner** will receive an e-mail that will contain details of the new object.

You can now query the RIPE Database and see your new **mntner** object. Type the following in the query window, substituting your **mntner** name:

```
-B example-mnt
```

Your new **mntner** object, as well as the **person** object referenced, will be returned.

```
% Information related to 'EXAMPLE-MNT'


mntner:        EXAMPLE-MNT
descr:         Sample maintainer for example
admin-c:       JS1-TEST
tech-c:        JS1-TEST
upd-to:        john.smith@example.com
mnt-nfy:       john.smith@example.com
auth:          MD5-PW $1$wCDUXtMe$MptgAFcPa3sy9QqQnbX4X/

notify:        john.smith@example.com
abuse-mailbox: abuse@example.com
mnt-by:        EXAMPLE-MNT
referral-by:   TEST-DBM-MNT
changed:       john.smith@example.com 20051104
source:        TEST
person:        John Smith
address:       Example LTD
               High street 12
               St.Mery Mead
               Essex, UK
phone:         +44 1737 892 004
e-mail:        john.smith@example.com
nic-hdl:       JS1-TEST
remarks:       *******************************
remarks:       This object is only an example!
remarks:       *******************************
abuse-mailbox: abuse@example.com
changed:       john.smith@example.com 20051104
source:        TEST
```

Note: the "-B" flag in the query is used in order to retrieve the complete objects from the RIPE Database. In a default query (without the "-B" flag), user contact information is filtered from the returned data. This helps to protect users from contact abuse. Filtered query results are easy to identify by looking at the "source:" attribute:

```
source: TEST # Filtered
```

If the keyword "# Filtered" is shown, it means that the query result has been filtered and some of the attributes are not shown.

By default, a query returns other objects containing associated contact information. This is why it returns the **person** object. If you do not want to see this information, use the "-r" (disable recursion) flag in your query. You can see how this works by typing the same query with this flag:

```
-r -B example-mnt
```

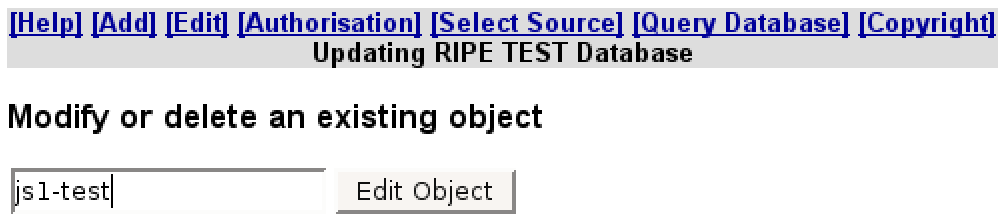
This time, only the **mntner** object is returned. Disabling recursion can result in a smaller, easier to understand reply, especially when associated contact information is unimportant. This is often the case when managing your own objects.

3.5 Protecting Your Contact Information

Now that you have a **mntner** object, you can protect other objects in the database. An object is protected by adding a reference to the **mntner** in the "mnt-by:" attribute.

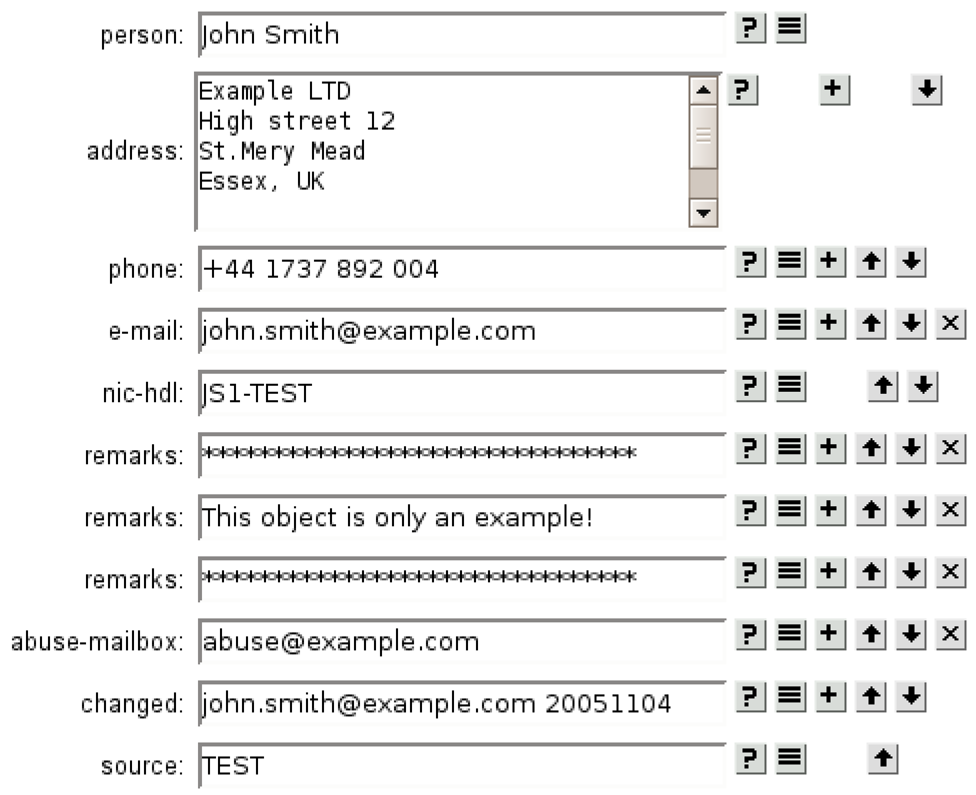
Most object types require you to protect them with your **mntner** object. However, **person** objects do not. We recommend that you protect them.. To protect your **person** object:

1. As before, within *webupdates*, choose the TEST Database as your update source, click on the **[Edit]** option and enter your **person** object "nic-hdle:"


[Help] [Add] [Edit] [Authorisation] [Select Source] [Query Database] [Copyright]
Updating RIPE TEST Database
Modify or delete an existing object
js1-test
Edit Object

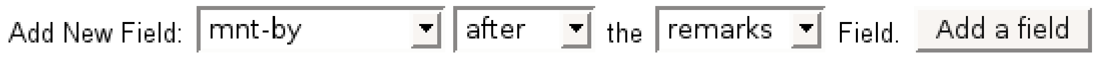
You can also enter your "person:" name instead of the "nic-hdl:" value. In this case, a list will be returned with all **person** objects that have that name. For common names, there may be many entries returned. Choose your object from this list.

2. The editor screen that follows, will show your **person** object with all of its current attribute values:



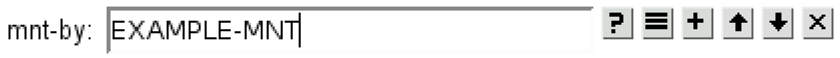
person:	John Smith
address:	Example LTD High street 12 St.Mery Mead Essex, UK
phone:	+44 1737 892 004
e-mail:	john.smith@example.com
nic-hdl:	JS1-TEST
remarks:	********************************
remarks:	This object is only an example!
remarks:	********************************
abuse-mailbox:	abuse@example.com
changed:	john.smith@example.com 20051104
source:	TEST

Using the **Add New Field** section, add your **mntner** as the "mnt-by:" for your **person** object.



Add New Field: mnt-by after the remarks Field. Add a field

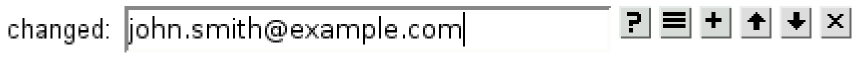
Fill in the value of the new attribute with your **mntner** object:



mnt-by: EXAMPLE-MNT

The database will not allow you to use a "mnt-by:" value, unless the **mntner** object already exists. An error will appear in the acknowledgement returned after you submit the update.

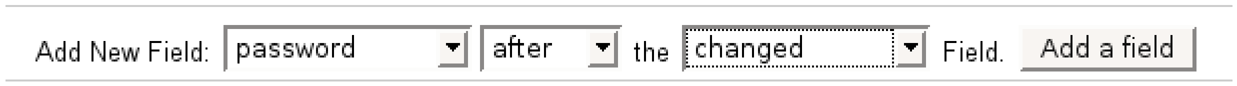
3. Add an additional "changed:" attribute to reflect the fact that you are modifying the object. Follow the same procedure shown above for the "mnt-by:" attribute. It must be placed after the existing "changed:" attribute values.



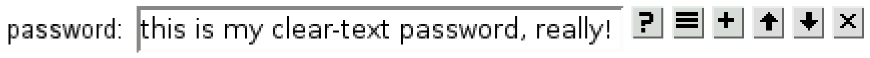
changed: john.smith@example.com

4. When you add a "mnt-by:" attribute to an object, you must authenticate yourself as the new **mntner** object. As this example uses the MD5-PW method, add a "password:" field

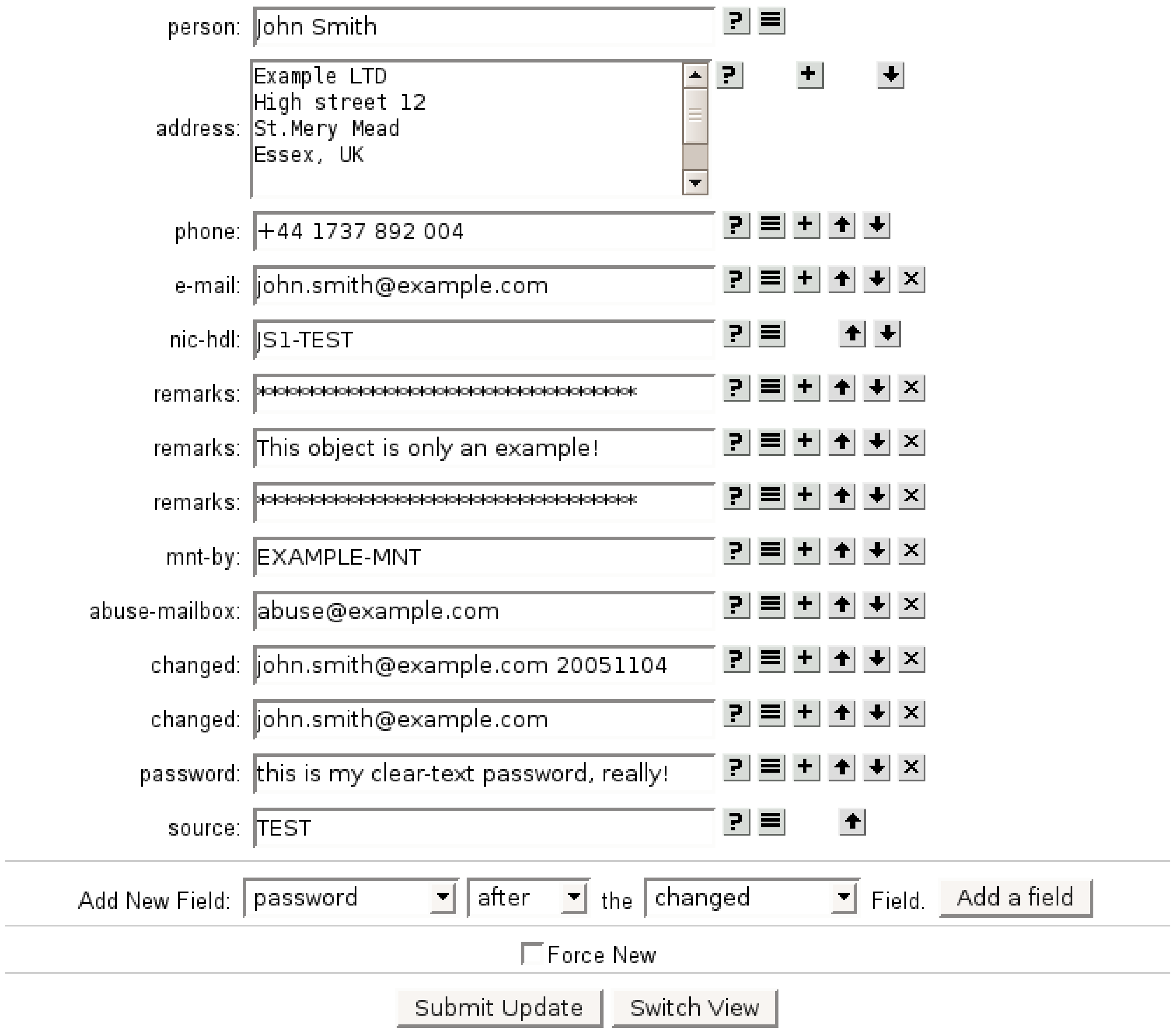
to the object, using the **Add New Field** section. The position of this field in the object is not important.



In this new "password:" field, type the *clear-text* password that you used to encrypt the MD5 string present in the "auth:" attribute of your **mntner** object. For example:


password: this is my clear-text password, really!

5. The final edited object should look similar to the one shown below. Click on **Submit Update** when you are ready.


person:	John Smith
address:	Example LTD High street 12 St.Mery Mead Essex, UK
phone:	+44 1737 892 004
e-mail:	john.smith@example.com
nic-hdl:	JS1-TEST
remarks:	********************************
remarks:	This object is only an example!
remarks:	********************************
mnt-by:	EXAMPLE-MNT
abuse-mailbox:	abuse@example.com
changed:	john.smith@example.com 20051104
changed:	john.smith@example.com
password:	this is my clear-text password, really!
source:	TEST

Add New Field: password after the changed Field.

6. Wait for an acknowledgement from the database. This will indicate the success or failure of your update. If the password entered did not match the one used in the **mntner** object, the update will fail and you will see a message similar to:

```
Modify FAILED: [person] JS1-TEST John Smith
***Error: Authorisation failed
***Info: Syntax check passed
```

In this case, you can just correct the password and re-submit the update.

3.6 Locating Network Assignments

Network assignments are represented by **inetnum** objects. Before you can create a new **inetnum** object, you must find a range of IP addresses that are not currently assigned. This section describes how you can query the database for this information. You can also use the queries whenever you want to get IP address information from the database.

By default, the database returns the smallest range that encompasses the entire range that you specify in your query. This is a '*less specific*' object. For example, if you query the following:

```
10.11.12.0 - 10.11.13.255
```

You might get something like this:

```
inetnum:    10.0.0.0 - 10.255.255.255
netname:    IANA-ABLK-RESERVED1
descr:      Class A address space for private internets
descr:      See http://www.ripe.net/db/rfc1918.html for details
country:    EU # Country is really world wide
admin-c:    AA1-TEST
tech-c:     AA2-TEST
status:     ALLOCATED UNSPECIFIED
remarks:    This network should never be routed outside an
            enterprise
remarks:    See RFC1918 for further information
mnt-by:     TEST-DBM-MNT
mnt-lower:  TEST-DBM-MNT
mnt-routes: TEST-DBM-MNT
source:     TEST # Filtered
```

This is called the *less specific* match. The range 10.11.12.0 - 10.11.13.255 fits entirely within the range 10.0.0.0 - 10.255.255.255. This is the smallest **inetnum** object in the database that encompasses the IP range in your query.

If you want the server to give you only an *exact* match, then you can request this using the "-x" flag. An exact match is one where the IP range of the **inetnum** object is the same as the IP range in the query.

```
-x 10.11.12.0 - 10.11.13.255
```

In this case you will get only an *exact* match, or an error that tells you that no such **inetnum** object exists:

```
%ERROR:101: no entries found
%
% No entries found in the selected source(s).
```

Sometimes, you may want to see all of the *less specific***inetnum** objects that encompass a range. In this case, you can use the "-L" flag. If you do this, you will see all **inetnum** objects that encompass the entire range queried, as well as any exact match.

For example, if you query the following:
```
-L 10.11.12.0 - 10.11.13.255
```

You might get something like this:

```
% Information related to '0.0.0.0 - 255.255.255.255'


inetnum:        0.0.0.0 - 255.255.255.255
netname:        IANA-BLK
descr:          The whole IPv4 address space
country:        EU # Country is really world wide
org:            ORG-TT1-TEST
admin-c:        AA1-TEST
tech-c:         AA2-TEST
status:         ALLOCATED UNSPECIFIED
remarks:        The country is really worldwide.
mnt-by:         TEST-ROOT-MNT
mnt-lower:      TEST-DBM-MNT
mnt-routes:     TEST-DBM-MNT
remarks:        This is an automatically created object.
source:         TEST # Filtered


% Information related to '10.0.0.0 - 10.255.255.255'


inetnum:        10.0.0.0 - 10.255.255.255
netname:        IANA-ABLK-RESERVED1
descr:          Class A address space for private internets
descr:          See http://www.ripe.net/db/rfc1918.html for details
country:        EU # Country is really world wide
admin-c:        AA1-TEST
tech-c:         AA2-TEST
status:         ALLOCATED UNSPECIFIED
remarks:        This network should never be routed outside an
enterprise
remarks:        See RFC1918 for further information
mnt-by:         TEST-DBM-MNT
mnt-lower:      TEST-DBM-MNT
mnt-routes:     TEST-DBM-MNT
source:         TEST # Filtered
```

For the query examples shown above, the "-B" flag was not included. The output from the RIPE Database was filtered for contacts, as described in 3.4 Registering Authentication Information. Therefore, the objects above are not shown fully. The "# Filtered" tag in the "source:" attribute tells you that the object was filtered. From here on, we will use the "-B" flag in most queries. This will retrieve the full objects as they are stored in the database itself.

You can also look for smaller **inetnum** objects corresponding to sub-ranges that are completely contained within a given range. This is a *more specific* query. You can use this on an allocation to look for ranges that have no other assignments. To do this, use the "-m" flag.

```
-B -m 10.11.0.0 - 10.11.255.255
```

You will get a reply that looks something like this:

```
% Information related to '10.11.11.0 - 10.11.11.255'


inetnum:        10.11.11.0 - 10.11.11.255
netname:        Example-Network
descr:          This is a fictitious assignment for the
descr:          End-User called "Example"
country:        GB
admin-c:        JS1-TEST
tech-c:         JS1-TEST
status:         ASSIGNED PA
notify:         john.smith@example.com
mnt-by:         EXAMPLE-MNT
mnt-lower:      EXAMPLE-MNT
mnt-routes:     EXAMPLE-MNT
changed:        john.smith@example.com 20051125
source:         TEST

% Information related to '10.11.13.0 - 10.11.13.255'

inetnum:        10.11.13.0 - 10.11.13.255
netname:        Example-Network-2
descr:          This is another fictitious assignment for the
descr:          End-User called "Example"
country:        GB
admin-c:        JS1-TEST
tech-c:         JS1-TEST
status:         ASSIGNED PA
notify:         john.smith@example.com
mnt-by:         EXAMPLE-MNT
mnt-lower:      EXAMPLE-MNT
mnt-routes:     EXAMPLE-MNT
changed:        john.smith@example.com 20051125
source:         TEST
```

This is a *one-level more specific* query. This means that the largest **inetnum** object that is completely contained within the given range is returned.

In this example, the IP addresses 10.11.12.0 - 10.11.12.255 are not assigned and are available. You will need to find an available range to do the exercise in the next section.

If you want to see all **inetnum** objects completely contained in a given range, you can use the "-M" flag:

This will return all levels of **inetnum** objects in the range. This can return an extremely large number of objects, but can be useful for finding all of the **inetnum** objects for a portion of the Internet.

```
 -M 10.0.0.0 - 10.255.255.255
```

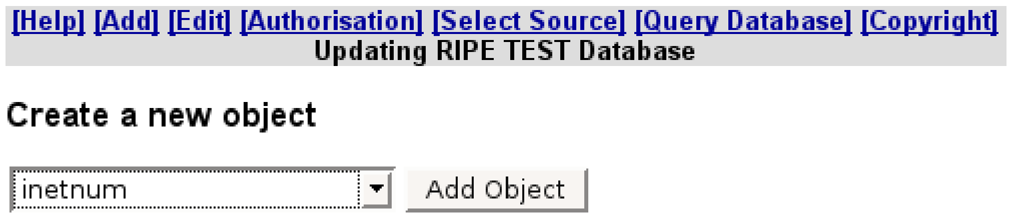
This will return all levels of **inetnum** objects in the range. This can return an extremely large number of objects, but can be useful for finding all of the **inetnum** objects for a portion of the Internet.

3.7 Recording Network Assignments

Now that all of the objects necessary for an **inetnum** object have been created and protected and you have located an appropriate range of IP numbers, you can create the **inetnum** object itself. It should be noted that this method of 'finding' IP ranges to 'use' is only for test purposes in the TEST Database. Here you can create any inetnum objects for testing purposes, even if you have no authority over that range.

To create a new **inetnum** object in the database:

1. As before, choose the TEST Database as source, then click on **[Add]** to create a new **inetnum** object:


[Help] [Add] [Edit] [Authorisation] [Select Source] [Query Database] [Copyright]
Updating RIPE TEST Database
Create a new object
inetnum
Add Object

2.Use the object editor to enter your network information. The following attributes are worth mentioning:

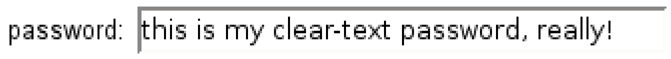
- For the "inetnum:" attribute, enter the IP range that you want to register. Since this is just for the TEST Database, it doesn't have to be a range that is really allocated to your organisation. You can use any available IP range. Follow the instructions in section 3.6 Locating Network Assignments to find an available IP range in the TEST Database.
- For the "admin-c:" and "tech-c:" attributes, use the nic-hdl of your **person** object.
- For the "status:" attribute use 'ASSIGNED PA'.
- For the "notify:" attribute, use the e-mail address where you wish to be notified of any updates to this object.
- For the "mnt-by:" or any other "mnt-*:" attribute, use the name of your maintainer.

You can get a full explanation of the syntax and meaning of all the attributes in this object by querying for:

```
-v inetnum
```

This will work for any object type.

Once again, you will need to provide authentication for your maintainer to create this object. Add your maintainer password to the field "password:". You can find out how to do this in Section 3.5 Protecting Your Contact Information.



password: this is my clear-text password, really!

The creation of new **inetnum** objects must also be authorised hierarchically. This means that while creating an **inetnum** object, the authentication for the *one-level less specific***inetnum** object (encompassing IP address range) is also required.

The "mnt-lower:" attribute in **inetnum** objects allows you to specify a specific maintainer for the creation of *more specific* (sub-assignments) **inetnum** objects.

To find out for which specific maintainer you must provide authentication, do the following:

- Query the RIPE Database for the *one-level less specific***inetnum** object:

```
-l [your IP range]
```

- Look for the **mntner** object referenced in the "mnt-lower:" attribute. If there is no "mnt-lower:" attribute, the **mntner** object referenced in the "mnt-by:" attribute is used.

For this specific example, querying for the *one-level less specific* object (-l 10.11.12.0 - 10.11.12.255) shows that it has:

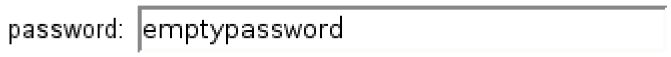
```
mnt-lower: TEST-DBM-MNT
```

To allow users to freely create **inetnum** objects in the TEST Database, we have published the password for this maintainer. You can find it in the **mntner** object itself:

```
mntner:         TEST-DBM-MNT
descr:          Mntner for TEST DBM objects.
admin-c:        AA1-TEST
tech-c:         AA2-TEST
auth:           MD5-PW $1$N2zhyJ3g$hzX7XTL84DtBkCWhBZE2c/
remarks:        ****************************************************
remarks:        Password is "emptypassword" without the quotes.
remarks:        ****************************************************
mnt-by:         TEST-ROOT-MNT
```

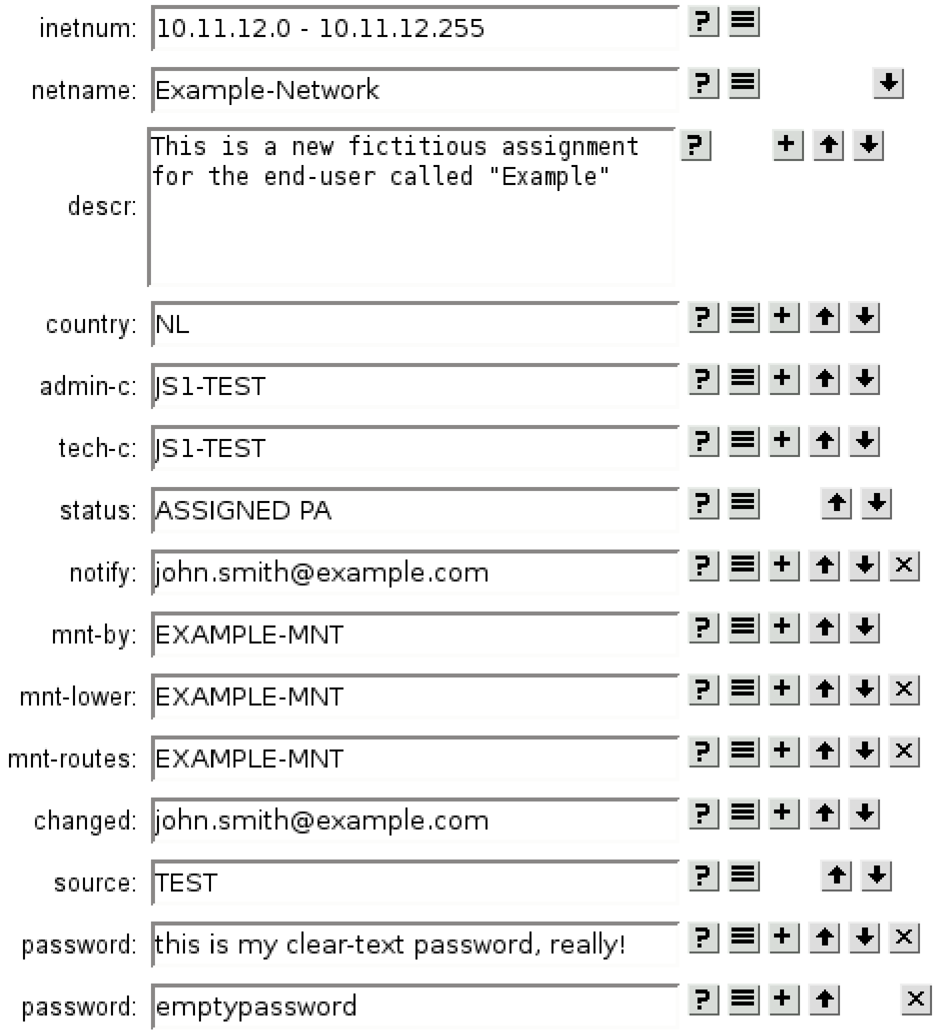
```
referral-by:    TEST-ROOT-MNT
remarks:        This is an automatically created object.
source:         TEST # Filtered
```

To pass the hierarchical authentication, you need to add an extra "password:" field to the object update with the password from TEST-DBM-MNT:



password: emptypassword

3. See below for an example of a new **inetnum** object. Click on **Submit Update**.



inetnum:	10.11.12.0 - 10.11.12.255
netname:	Example-Network
descr:	This is a new fictitious assignment for the end-user called "Example"
country:	NL
admin-c:	JS1-TEST
tech-c:	JS1-TEST
status:	ASSIGNED PA
notify:	john.smith@example.com
mnt-by:	EXAMPLE-MNT
mnt-lower:	EXAMPLE-MNT
mnt-routes:	EXAMPLE-MNT
changed:	john.smith@example.com
source:	TEST
password:	this is my clear-text password, really!
password:	emptypassword

4. Wait for the acknowledgement to return from the whois database. If your update was successful, you will get a reply containing something like the following:

```
Create SUCCEEDED: [inetnum] 10.11.12.0 - 10.11.12.255
```

If there was an error, the acknowledgement will tell you what errors were found. For example, it may contain the following:

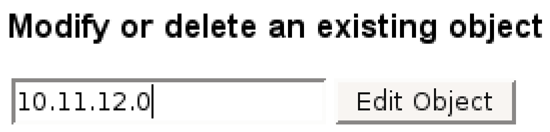
```
Update FAILED: [inetnum] 10.11.12.0 - 10.11.12.255
***Error: Syntax error in object
```

5. If it is successful, the e-mail address in the "mnt-nfy:" attribute of your **mntner** object will receive an e-mail with the details of the new object.

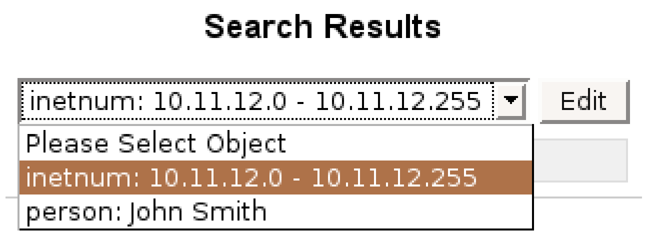
3.8 Modifying the INETNUM object

You can modify information in your **inetnum** object. You might need to do this if the technical contact has changed and is now represented by the **person** object "MJ3-TEST". (You must first create a new person object before you can follow this example.) To modify an existing object, do the following:

1. Click on **[Edit]** in *webupdates*. In the text box, enter one IP address of the **inetnum** object range, the full IP range, the "netname:", or even the name from the referenced **person** object(s). Click on **Edit Object**.



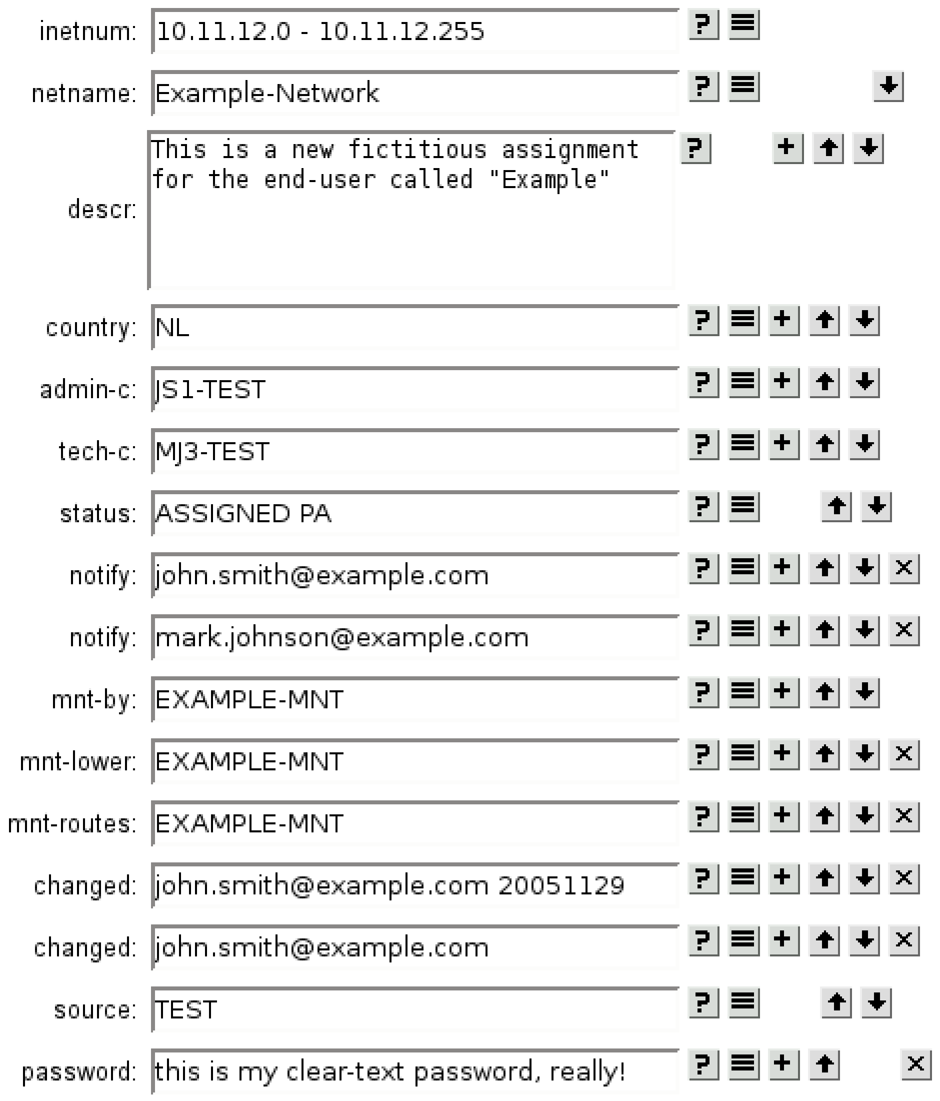
2. From the "Search Results" list, select your **inetnum** object and click on **Edit**.


Search Results
inetnum: 10.11.12.0 - 10.11.12.255
Edit
Please Select Object
inetnum: 10.11.12.0 - 10.11.12.255
person: John Smith

3. Using the object editor, change the "tech-c:" attribute to the new **person** object. Add a "notify:" attribute, so the new technical contact will be notified when the **inetnum** object is modified.

You also need to include the password for your maintainer so that the modification is authorised, as well as a new "changed:" line to keep track of the history of modifications to the object. The new "changed:" line must follow all existing ones.

Note: The hierarchical authorisation is only required for creation of **inetnum** objects, not modification. You do not have to include the second password (from the *less-specific* IP block) in this update.



inetnum:	10.11.12.0 - 10.11.12.255
netname:	Example-Network
descr:	This is a new fictitious assignment for the end-user called "Example"
country:	NL
admin-c:	JS1-TEST
tech-c:	MJ3-TEST
status:	ASSIGNED PA
notify:	john.smith@example.com
notify:	mark.johnson@example.com
mnt-by:	EXAMPLE-MNT
mnt-lower:	EXAMPLE-MNT
mnt-routes:	EXAMPLE-MNT
changed:	john.smith@example.com 20051129
changed:	john.smith@example.com
source:	TEST
password:	this is my clear-text password, really!

You cannot change the primary attribute of the object (**inetnum**: 10.11.12.0 - 10.11.12.255). The database will consider this to be a creation of a new object.

4. Click on **Submit Updat**e to process this:

5. Wait for an acknowledgement from the database. This will tell you if your update was successful. If there was an error, the message that you receive will tell you what was wrong.

6. The e-mail address in the "notify:" attribute of the original object will be sent a message with the details of the change. In a similar way, a notification e-mail will be sent to the "mnt-nfy:" of the maintainer.

3.9 Deleting Objects

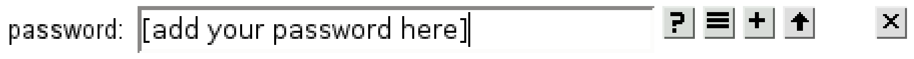
Sometimes you no longer need objects that you maintain. You should delete these. For example, if an assignment is no longer used you should delete the **inetnum** object and all **person** and **mntner** objects that are referenced only from that object.

To delete an existing object:

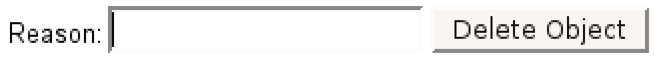
1. Select the object that you wish to remove using the **[Edit]** option in *webupdates*. Follow steps 1 and 2 in Section 3.8 Modifying the INETNUM Object to query for this object and present the object details.

2. In the object editor, do not change any of the attributes. If the object submitted is not an exact copy of the one stored in the RIPE Database, the deletion will fail.

Add only a "password:" field to authenticate you as the valid maintainer. Deletion of objects in the RIPE Database/TEST Database must also be authorised.


password: [add your password here]

3. At the bottom of the editor page, enter the reason for this object deletion in the **Reason** box. Click on **Delete Object**, when done.

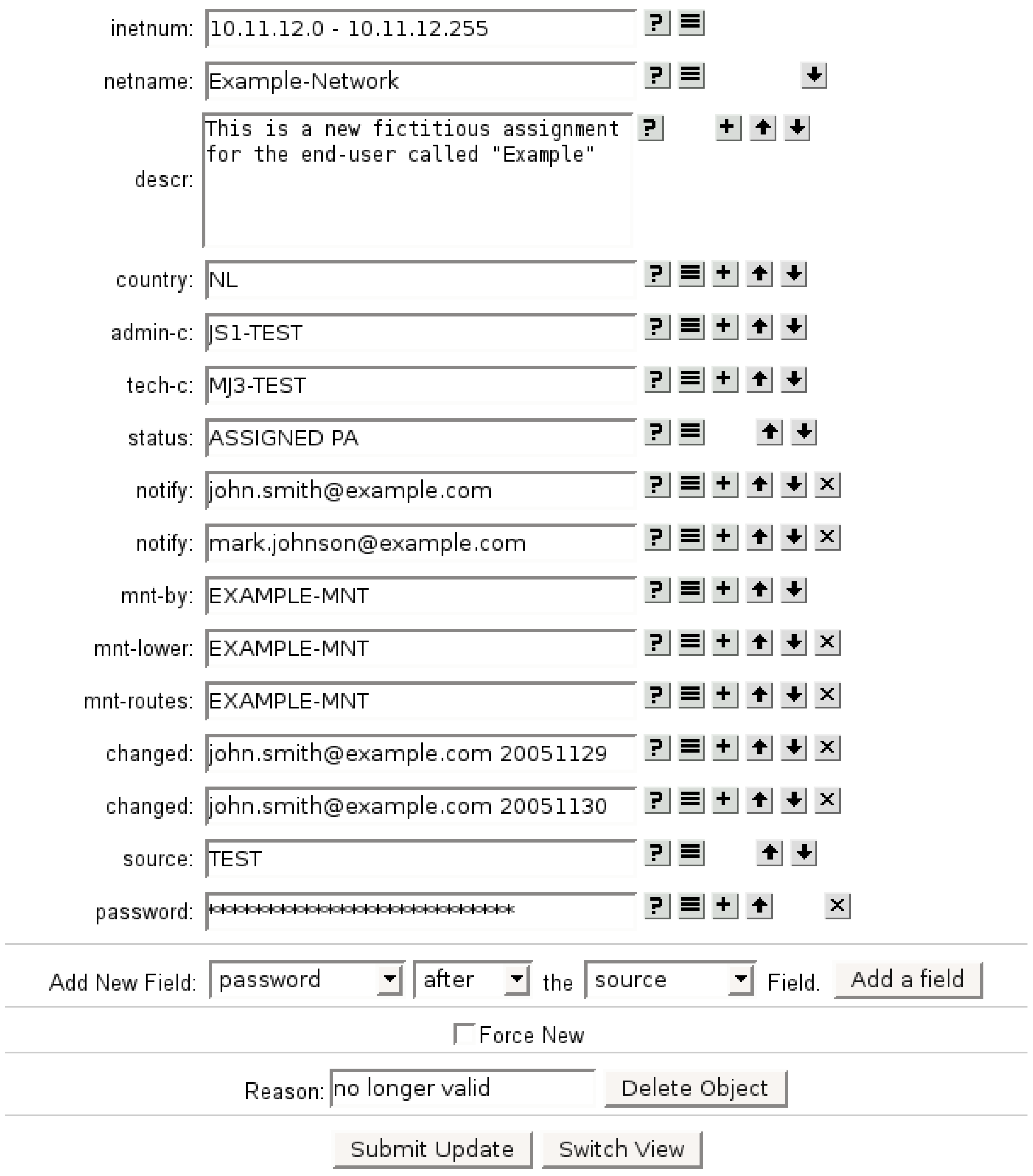


This will automatically submit the update for processing to the TEST Database adding a line in the format:

```
delete: [reason for deletion]
```

This indicates that this object is to be deleted from the database.

Example of a deletion:



inetnum:	10.11.12.0 - 10.11.12.255
netname:	Example-Network
descr:	This is a new fictitious assignment for the end-user called "Example"
country:	NL
admin-c:	JS1-TEST
tech-c:	MJ3-TEST
status:	ASSIGNED PA
notify:	john.smith@example.com
notify:	mark.johnson@example.com
mnt-by:	EXAMPLE-MNT
mnt-lower:	EXAMPLE-MNT
mnt-routes:	EXAMPLE-MNT
changed:	john.smith@example.com 20051129
changed:	john.smith@example.com 20051130
source:	TEST
password:	**************************

Add New Field: password after the source Field.

☐ Force New

Reason: no longer valid

4. Press **Submit Update**.

5. Wait for an acknowledgement from the database. This will tell you if your deletion was successful.

6. The e-mail addresses in the "notify:" attribute of the object, as well as the "mnt-nfy:" attribute of the mnt-by: **mntner**,attribute of the mnt-by: **mntner**will receive a message with the details of the deletion.

Objects that are referenced by other objects cannot be deleted. For example, a **mntner** object cannot be deleted while it is used in "mnt-by:" or any other attribute. You can find the references to a **mntner** object by using an inverse query. Type the following in the query window, substituting your **mntner** object:

```
-i mnt-by,mnt-lower,mnt-routes,mnt-domains,mnt-ref -r EXAMPLE-MNT
```

This will return all of the objects that reference EXAMPLE-MNT. The "-i" flag requests the inverse query, and the "mnt-by,mnt-lower,mnt-routes,mnt-domains,mnt-ref" specify which attributes you want to look at. There must not be a space after any of the commas. The "-r" disables recursion (associated objects will not be displayed).

Before you can delete a **mntner** object, you must remove all references to it.

For example, if you have the following **mntner** and **person** objects:

```
% Information related to 'EXAMPLE-MNT'

mntner:         EXAMPLE-MNT
descr:          Sample maintainer for example
admin-c:        JS1-TEST
tech-c:         JS1-TEST
upd-to:         john.smith@example.com
mnt-nfy:        john.smith@example.com
auth:           MD5-PW $1$wCDUXtMe$MptgAFcPa3sy9QqQnbX4X/
notify:         john.smith@example.com
abuse-mailbox: abuse@example.com
mnt-by:         EXAMPLE-MNT
referral-by:    TEST-DBM-MNT
changed:        john.smith@example.com 20051104
source:         TEST


% Information related to 'JS1-TEST'


person:         John Smith
address:        Example LTD
                High street 12
                St.Mery Mead
                Essex, UK
phone:          +44 1737 892 004
e-mail:         john.smith@example.com
nic-hdl:        JS1-TEST
mnt-by:         EXAMPLE-MNT
remarks:        *******************************
remarks:        This object is only an example!
remarks:        *******************************
abuse-mailbox: abuse@example.com
changed:        john.smith@example.com 20051104
```

```
changed:       john.smith@example.com 20051109
source:        TEST
```

The **mntner** "EXAMPLE-MNT" cannot be deleted, because it is referenced by the **person** "JS1-TEST". The **person** "JS1-TEST" cannot be deleted, because it is referenced by the **mntner** "EXAMPLE-MNT". To delete these objects, do the following:

1. Modify the **person** object, and remove the "mnt-by:" attribute. This removes all protection, but this is not a security issue, because the object will be deleted.
2. Delete the **mntner** object.
3. Delete the **person** object.

(Please remember to delete all objects you created in the TEST Database while doing these exercises.)

4.0 Extra Features

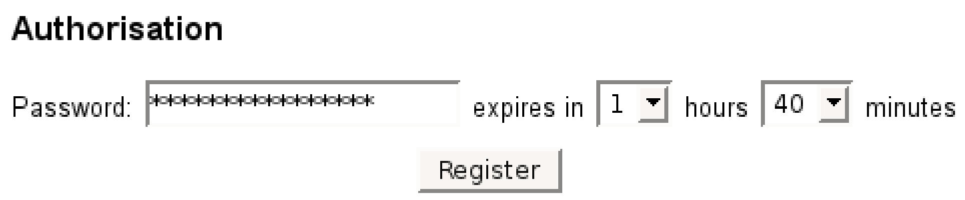
4.1 Keeping a Password in *webupdates* Memory

If you want to use your maintainer authentication password in several updates, you can save it for a specified amount of time.

To do this:

1. Before starting to update any of your objects, click on the **[Authorisation]** option.

2. Type in your password and select the amount of time that you want to keep your password in memory.


Authorisation

Password: ****************** expires in 1 hours 40 minutes

3. Click on **Register**

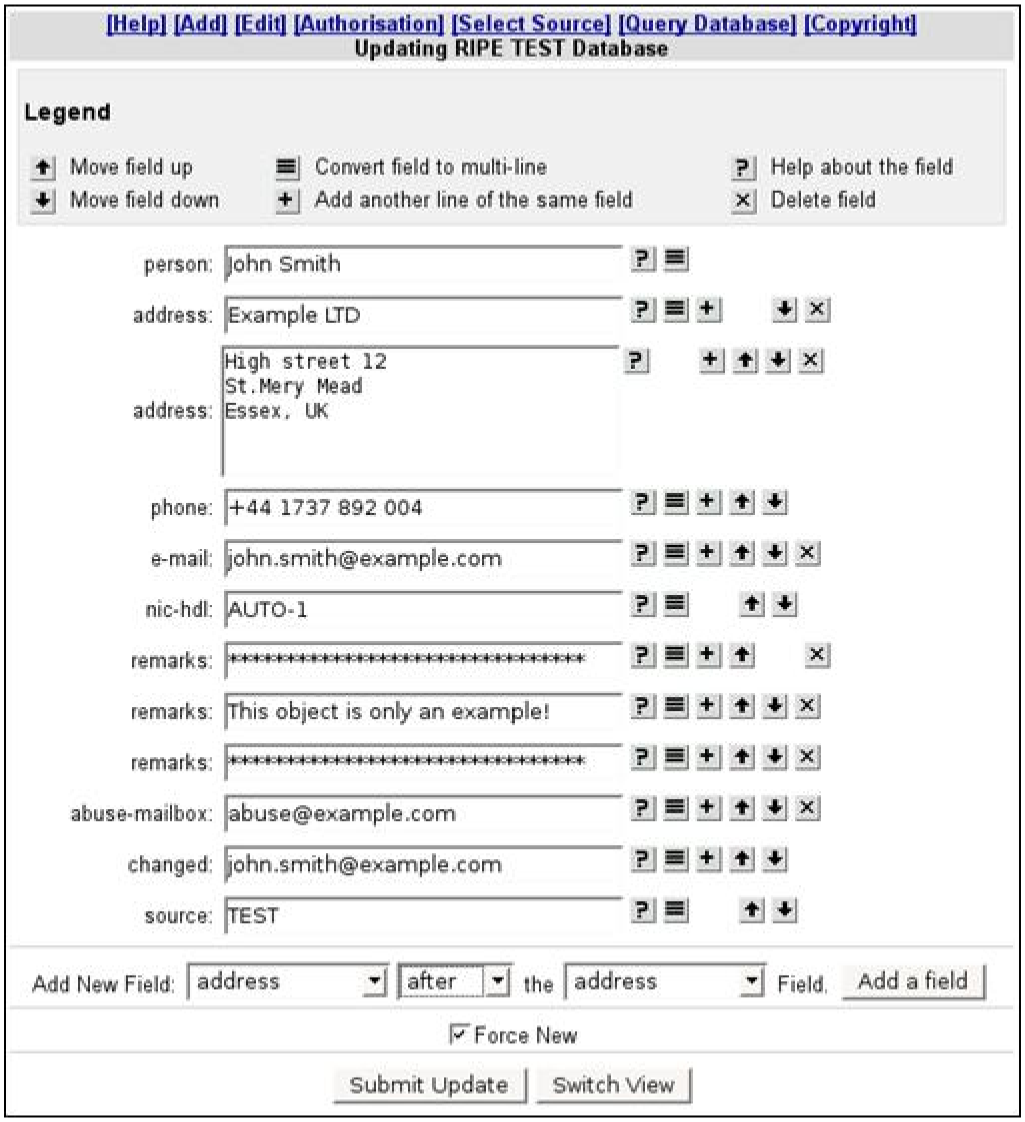
You can now start editing your objects. From here on, and for however long that you specify, all updates submitted through *webupdates* from your computer will automatically include the password you entered.

4.2 Edit an Object in Text-Based View Using *webupdates*

Using *webupdates*, you can edit an object in text-based mode, instead of the field-based mode used so far. This can be helpful in situations when *copy-paste* operations are needed.

This is done using the **Switch View** option. It allows you to switch between 'field-based' and 'text-based' editing.

For example, if you are editing an object as shown below:



[Help] [Add] [Edit] [Authorisation] [Select Source] [Query Database] [Copyright]
Updating RIPE TEST Database

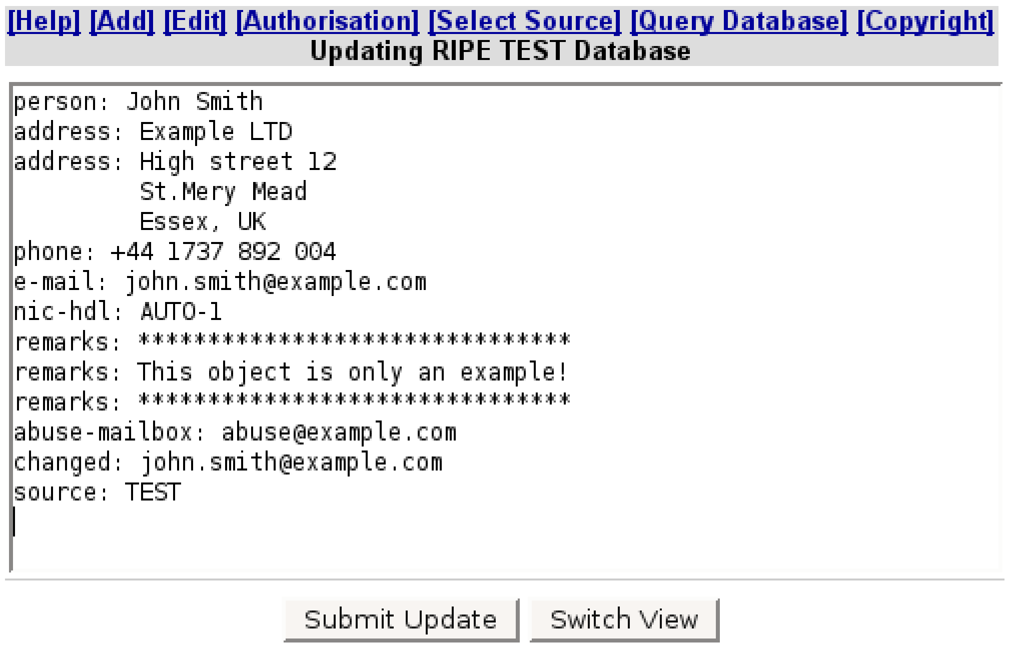
Legend

Move field up	Convert field to multi-line	Help about the field
Move field down	Add another line of the same field	Delete field

person:	John Smith
address:	Example LTD
address:	High street 12 St.Mery Mead Essex, UK
phone:	+44 1737 892 004
e-mail:	john.smith@example.com
nic-hdl:	AUTO-1
remarks:	**********************************
remarks:	This object is only an example!
remarks:	**********************************
abuse-mailbox:	abuse@example.com
changed:	john.smith@example.com
source:	TEST

Add New Field: address after the address Field.

Pressing the **Switch View** button allows you to switch to text-based mode:


[Help] [Add] [Edit] [Authorisation] [Select Source] [Query Database] [Copyright]
Updating RIPE TEST Database
Submit Update
Switch View

```
person: John Smith
address: Example LTD
address: High street 12
         St.Mery Mead
         Essex, UK
phone: +44 1737 892 004
e-mail: john.smith@example.com
nic-hdl: AUTO-1
remarks: ******************************
remarks: This object is only an example!
remarks: ******************************
abuse-mailbox: abuse@example.com
changed: john.smith@example.com
source: TEST
```

In this mode, you can edit the object as free text, including adding and removing attributes to the object.

Pressing **Switch View** once again switches back to the field-based mode. Pressing **Submit Update** submits your update to the RIPE Database.

You can switch between both edit modes while editing an object. However, please notice that *webupdates* will only let you switch from text-based mode to field-based mode, if there are no syntax errors in the object.

4.3 Updates By E-mail

Another way of updating objects in the RIPE/TEST Database is by using e-mail. This is useful if you need to update several objects at the same time.

You should send updates for the TEST Database to <test-dbm@ripe.net>. We automatically process all updates sent to this e-mail address, no human handling is involved.

Follow these steps when you prepare your e-mail:

1. Include the complete objects that you wish to update (create, modify or delete) in the e-mail, with at least one blank line between each object, and completely aligned to the left (no space characters at the beginning of the lines). Please don't include any blank lines in between the attributes of any object, as this will prevent it from being recognised.

2. If you want to delete an object, include the complete object exactly as stored in the RIPE Database and add an extra field to the object with the syntax:

   delete: [reason for deleting]
3. Include in the e-mail, all the clear-text passwords needed to perform the updates, with the following syntax:

   password: [clear-text password]

   You need only include each cleartext password once in the message, even if it is required by several objects.
4. Send your e-mail to <test-dbm@ripe.net>

Here is an example of an e-mail update to the TEST Database:

```
inetnum:       10.11.12.0 - 10.11.12.255
netname:       Example-Network
descr:         This is a new fictitious assignment
               for the end-user called "Example"
country:       NL
admin-c:       JS1-TEST
tech-c:        MJ3-TEST
status:        ASSIGNED PA
notify:        john.smith@example.com
notify:        mark.johnson@ripe.net
mnt-by:        EXAMPLE-MNT
mnt-lower:     EXAMPLE-MNT
mnt-routes:    EXAMPLE-MNT
changed:       john.smith@example.com 20051129
changed:       john.smith@example.com 20051130
source:        TEST
delete:        IP assignment has been cancelled

person:        John Smith
address:       Example LTD
               High street 12
               St.Mery Mead
               Essex, UK
phone:         +44 1742 812 991
e-mail:        john.smith@example.com
nic-hdl:       JS1-TEST
mnt-by:        EXAMPLE-MNT
remarks:
************************************************************
remarks:       This object is still an example, but the phone has
changed!
remarks:
************************************************************
abuse-mailbox: abuse@example.com
changed:       john.smith@example.com 20051104
changed:       john.smith@example.com 20051109
changed:       john.smith@example.com
source:        TEST
```

```
password: this is my clear-text password, really!
```

After your update has been processed, you will receive the results by e-mail. The reply will tell you which objects were updated successfully and which ones failed. For the objects that failed, you will get an explanation with the errors. This is similar to what is shown in the *webupdates* report.

4.4 Whois Client

You can also perform queries on the database by using a whois software client.

There is a whois client, developed by the RIPE NCC, available for free download. [3]

To perform queries on the TEST Database, use the syntax:

whois –h test-whois.ripe.net <query-text>

Where <*query-text*> is the full query text that would be entered in the web query box shown in Section 2.1 Web Queries.

4.5 Important Query Flags

Here is a list of commonly used flags that can be useful when querying the RIPE database. Please note that these flags are case-sensitive.

General query flags:

-B	Disables the default query behaviour of filtering the "notify:", "changed:" and "e-mail:" attributes, to protect users from contact abuse. This flag is helpful for retrieving the objects exactly as they are stored in the RIPE Database. It is important to use this flag when updating database objects by e-mail, to prevent information from being lost in the update.
-r	Disables the default query behaviour of recursion for contact information after retrieving the objects that match the lookup key. You should use this flag if you do not want to retrieve the **person** and **role** objects that contain the contact information associated with the object that you are querying for.
-t <object-type>	Requests a template for the specified object type. Using this flag you can see all the possible attributes used in an object type as well as their characteristics.

-v <object-type>	Requests a verbose template for the specified object type. This flag works as **–t,** but also gives you a detailed explanation of each attribute, and the expected syntax. It can be very helpful when you receive a syntax error while updating an object in the RIPE Database.
-i <attribute-name><inverse-key>	Perform an inverse query. This flag is useful to see in which objects a certain object is referenced. For example: `-i mnt-by EXAMPLE-MNT` will show all the objects that are maintained by the **maintainer** EXAMPLE-MNT.

IP range query flags:

-l <ip-lookup>	*One-level less specific* query. This returns the smallest **inetnum** range that encompasses the entire IP range specified in the query, excluding the exact match.
-L <ip-lookup>	*All-levels less specific* query. This returns all the less specific **inetnum** objects that encompass the IP range specified in the query, including the exact match.
-m <ip-lookup>	*One-level more specific* query. This returns the largest **inetnum** ranges that are completely contained in the IP range specified in the query, excluding the exact match
-M <ip-lookup>	*All-levels more specific* query. This returns all the levels of **inetnum** objects contained in the IP range specified in the query, excluding the exact match. This can return an extremely large number of objects, depending on which IP range is used.
-x <ip-lookup>	*Exact match* query. This returns the **inetnum** object that exactly corresponds to the IP range specified in the query. If no exact match is found no objects are returned

In a default IP range query, without any of the flags mentioned above, the exact match object will be returned. If no exact match is found, the one-level less specific **inetnum** object will be returned.

To see a full list of all the flags that you can use when querying the RIPE Database, enter 'help' in the query box:

help

5.0 Using the Production RIPE Database

You should now have an understanding of the basic concepts of the RIPE Database and be able to maintain your own data and perform queries. This section explains the differences between the TEST Database and the RIPE Database.

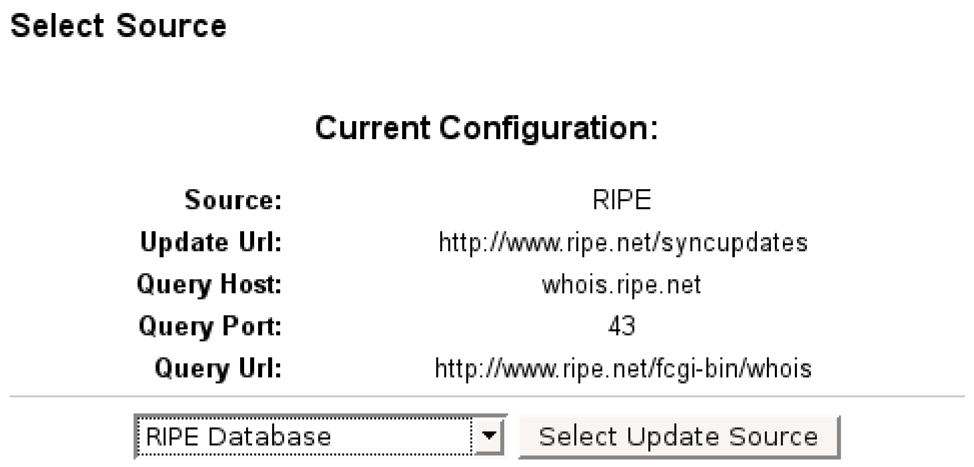
For the RIPE Database:

1. Queries use a different search tool: http://www.ripe.net/whois

2. For queries using a whois client, connect to the server: *whois.ripe.net*

whois -h whois.ripe.net <query-text>

3. In *webupdates*, select RIPE Database as the source (default), by using the **[Select Source]** option:


Select Source

Current Configuration:

Source:	RIPE
Update Url:	http://www.ripe.net/syncupdates
Query Host:	whois.ripe.net
Query Port:	43
Query Url:	http://www.ripe.net/fcgi-bin/whois

4. You should send e-mail updates for the RIPE Database to <auto-dbm@ripe.net>.

5. Objects in the RIPE Database use RIPE for both the "source:" attribute and the suffix appended to "nic-hdl:" attributes.

6. When creating your **mntner** object in the RIPE Database, use RIPE-DBM-MNT for the "referral-by:" attribute.

7. You cannot create **inetnum** objects in the RIPE Database unless you have received authorisation from the LIR that holds the responsibility for that address range.

6.0 Where to Learn More

The following resources are available to help you use the RIPE Database.

6.1 Help

A query for "help" will return a full list of all of the 'flags' that you can use when you query the database.

```
help
```

While we covered some of these in this document, there are many others.

To receive detailed information about an object type and all of its attributes, query for:

```
-v <object-type>
```

6.2 Database FAQ

The Database Frequently Asked Questions (FAQs) are available at:
http://www.ripe.net/info/faq/db/index.html

We frequently update this page with helpful information based on the needs of users and new features offered by the software.

6.3 RIPE Database Documents

The definitive source of information for the RIPE Database is the database area of the RIPE Document Store:
http://www.ripe.net/ripe/docs/database.html

Here you can find the latest versions of the RIPE Database Reference Manuals [1] [2], which contain detailed information about all of the topics covered in this guide, as well as other relevant documents covering how to use the RIPE Database.

6.4 LIR Training Courses

The RIPE NCC provides training for Local Internet Registries. You can find more information about this at:
http://www.ripe.net/training/

6.5 Specific Questions

If you have a specific question that has not been answered in this guide, send it to <ripe-dbm@ripe.net>. A RIPE NCC customer service representative will answer your mail.

You can also post a question to the <db-help@ripe.net> mailing list. You can find information about this list at:
http://www.ripe.net/mailman/listinfo/db-help/index.html

References

[1] RIPE Database Query Reference Manual
http://www.ripe.net/ripe/docs/db-query-manual.html

[2] RIPE Database Reference Manual
http://www.ripe.net/ripe/docs/databaseref-manual.html
This contains detailed information about updating objects in the RIPE Database. It will be replaced by a new document: "RIPE Database Update Reference Manual". (Draft published 17 April 2007)

[3] Whois Client
You can find the latest version at:
http://whois.sourceforge.net/