

Network Management & Monitoring

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1 Request Tracker (RT) Installation and Configuration

1.1 Notes:

- Commands preceded with “\$” imply that you should execute the command as a general user - not as root.
- Commands preceded with “#” imply that you should be working as the root user.
- Commands with more specific command lines (e.g. RTR-GW> or mysql>) imply that you are executing commands on remote equipment, or within another program.
- If a command line ends with “\” this indicates that the command continues on the next line and you should treat this as a single line.

2 Exercises

2.1 Exercise 0

Log in to your virtual machine as the sysadm user.

2.2 Exercise 1

Install the necessary packages for RT. You should have mysql-server already, but we do the install just in case. This won’t cause problems.

Copy the “sudo apt-get install” line below, minus the “\$” and paste this in to your terminal session on your virtual machine.

```
$ sudo apt-get install rt4-apache2 rt4-clients rt4-db-mysql request-tracker4 libapache2-mod-
```

Respond “Yes” when prompted if you wish to install the packages.

You will now be presented with several windows. Read the following instructions to see how to respond:

Name for this Request Tracker (RT) instance:

Remove what is shown and replace with “netmgmt”, then select <Ok> and press ENTER to continue.

Handle RT_SiteConfig.pm permissions?

- Select <Yes> and press ENTER to continue.

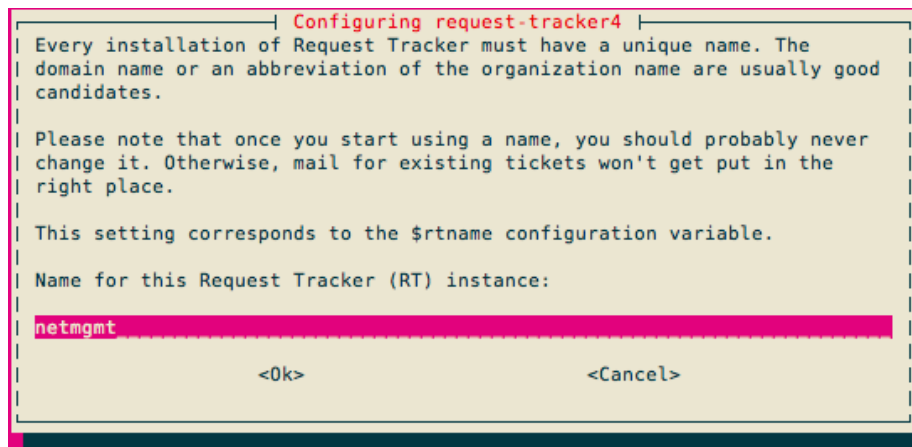


Figure 1: RT installation name

Configure database for request-tracker4 with dbconfig-common?

- Select <Yes> and press ENTER to continue.

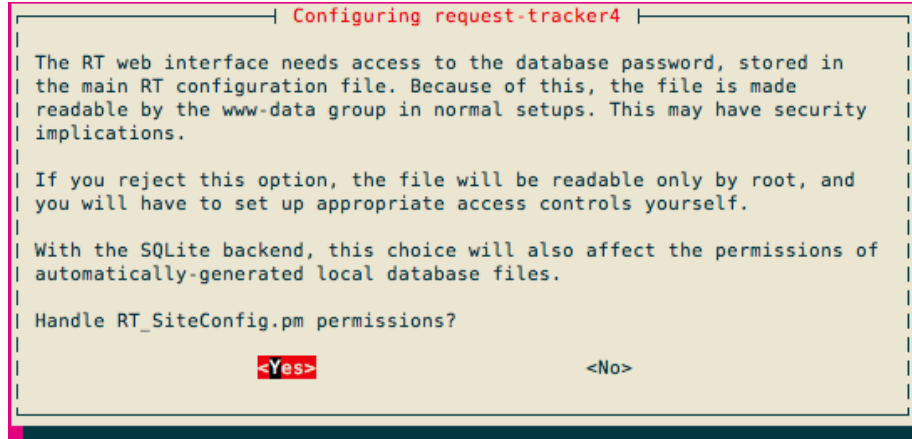


Figure 2: DB configuration

Password of the database's administrative user:

Enter the MySQL **root** or **admin** password. This was set earlier in the workshop (probably when you installed Cacti). If you do not remember what this is, or if it's not written at the front of the classroom, ask an instructor for help.

MySQL application password for request-tracker4:

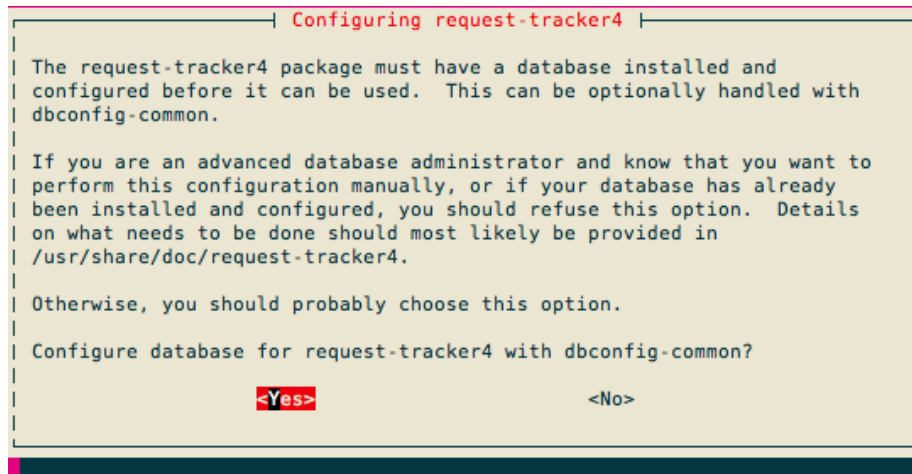


Figure 3: DB admin password

You may enter any password you wish. This will be used by Request Tracker to connect to MySQL. You generally do not need to remember this password. Pick something that cannot be guessed easily (i.e., don't use `rt`, `requesttracker`, `1234`, etc...).

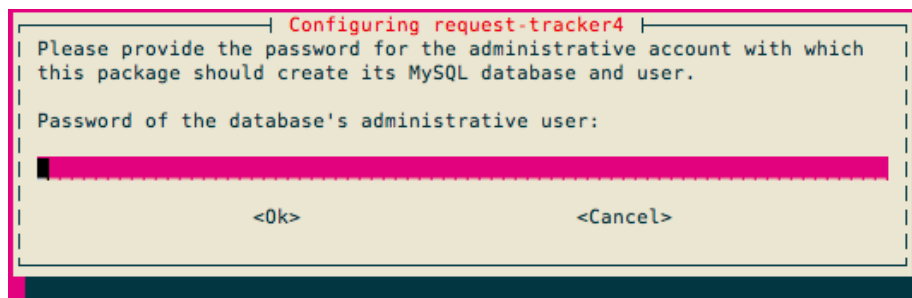


Figure 4: DB application password

Password confirmation:

- Enter the same password that you created in the previous step.

Initial root password for RT system:

- Use the same password as we used for the MySQL database administrative user.

Now you will see quite a bit of information go across your screen as the Request Tracker installation process completes - It's a big package.

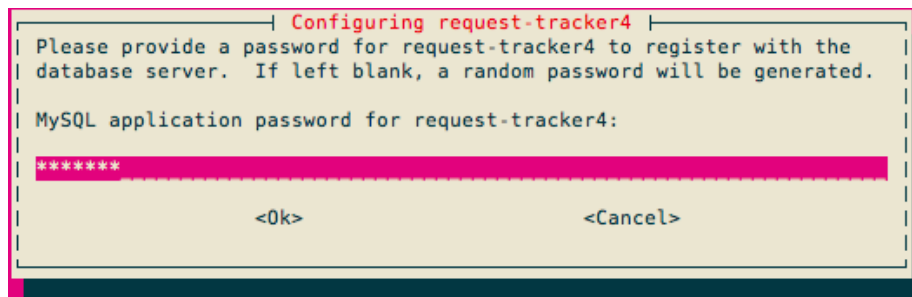


Figure 5: DB application password

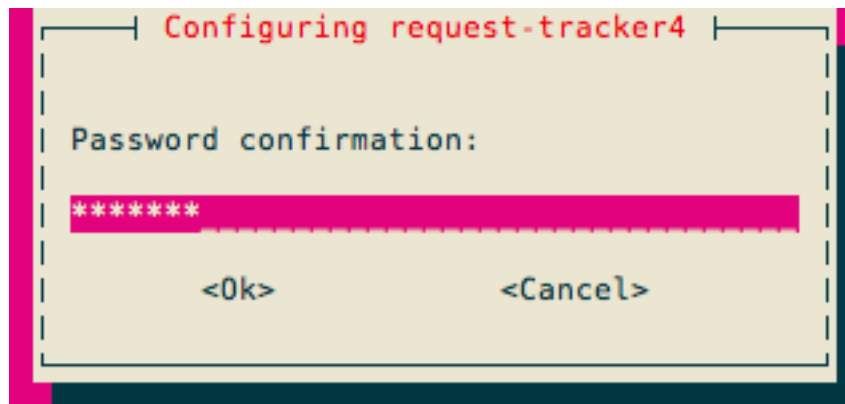


Figure 6: Initial root password

2.3 Exercise 3

At this point you have installed Request Tracker version 4. In order to access RT via the Apache web server you need to make a few small changes.

First let's update the Request Tracker (RT) configuration to improve the "From:" field format that will be used when RT sends out emails to users. In addition we will restrict attachment sizes and we will add our RT server to a whitelist to avoid cross site forgery error messages for legitimate RT usage.

Request Tracker maintains configuration files in the directory:

```
/etc/request-tracker4/RT_SiteConfig.d
```

We will go to this directory, create a new configuration file called 90-local and regenerate the RT RT_SiteConfig.pm file using the update-rt-siteconfig command:

```
$ cd /etc/request-tracker4/RT_SiteConfig.d
$ sudo editor 90-local
```

Add the following two lines to the file 90-local:

```
Set($MaxAttachmentSize , 10000000);
Set(@ReferrerWhitelist, qw(x.x.x.x:80  SERVNAME:80));
```

In the ReferrerWhitelist entry x.x.x.x. is the IP address of your PC and SERVNAME is the name of your PC. That is, if you are on pc1.ws.nsrc.org you would enter:

```
Set(@ReferrerWhitelist, qw(10.10.1.1:80  pc1.ws.nsrc.org:80));
```

Be sure to use the correct IP address and name for your PC, then save the file and execute the command:

```
$ sudo update-rt-siteconfig
```

Now we have one more change to the Apache web server configuration to make:

```
$ cd /etc/apache2/conf-available
$ sudo ln -s /etc/request-tracker4/apache2-modperl2.conf rt4.conf
$ sudo a2enconf rt4
$ sudo service apache2 restart
```

The last step could take up to 30 seconds, so be patient! RT should now be up and running!

2.4 Exercise 3

Log in to RT as the root User

If you go to <http://pcN.ws.nsrc.org/rt/> you will see the RT login screen:

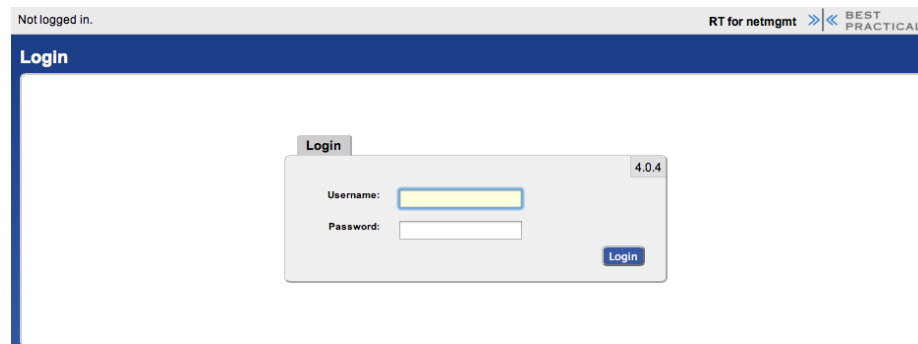


Figure 7: Login screen

Enter the following information to log in as **root** on RT:

Username: root

Password: [SELECTED AT INSTALL]

2.5 Exercise 4

RT Configuration: Create a User

Now that you are logged in we will create a new user for the rest of these exercises.

On the top of the screen choose Tools => Configuration => Users and then click on the **Create** item in the menu.

You will now be presented with the following dialogue. Fill in the fields, and make sure the checkbox **Let this user be granted rights** is checked. Set your email to **sysadm@pcX.ws.nsrc.org** (X = your PC)

Use the same password for **sysadm** as you are using in class. Be sure you check **Let this user be granted rights**. Once done, scroll down the page and click on the **Create** button (bottom right). You should see this:

2.6 Exercise 5

RT Configuration: Create a Group

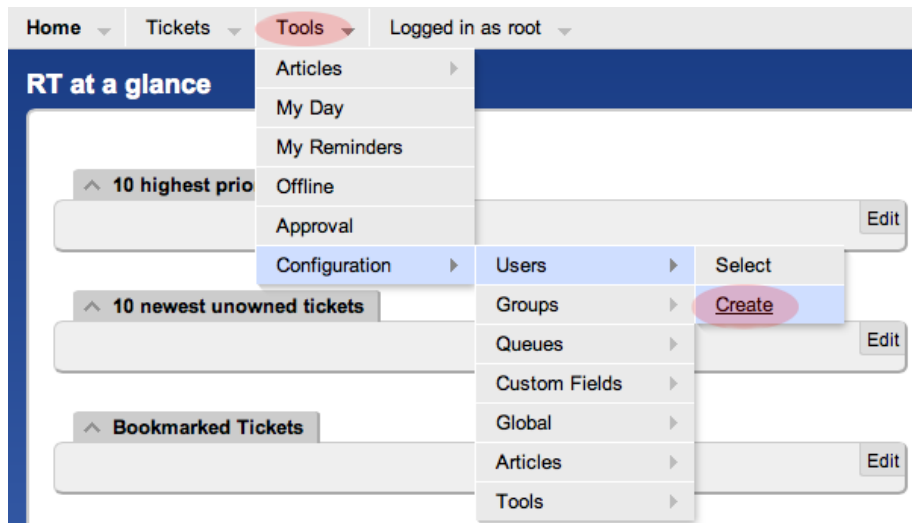


Figure 8: Create User

The screenshot shows the 'Create a new user' form in the RT interface. The form is divided into several sections: 'Identity', 'Location', 'Access control', 'Phone numbers', and 'Custom Fields'. The 'Identity' section contains fields for 'Username' (sysadm), 'Email' (sysadm@pcx.ws.nsrc.), 'Real Name' (System Admin), 'Nickname', 'Unix login', 'Language', and 'Extra info'. The 'Location' section contains fields for 'Organization', 'Address1', 'Address2', 'City', 'State', 'Zip', and 'Country'. The 'Access control' section contains checkboxes for 'Let this user access RT' and 'Let this user be granted rights (Privileged)', both of which are checked. Below these checkboxes are fields for 'root's current password', 'New password', and 'Retype Password'. The 'Phone numbers' section contains fields for 'Home', 'Work', 'Mobile', and 'Pager'. The 'Custom Fields' section is currently collapsed. At the bottom right of the form, there is a 'Create' button highlighted with a red circle. A red arrow points to the 'Let this user be granted rights (Privileged)' checkbox.

Figure 9: User creation form

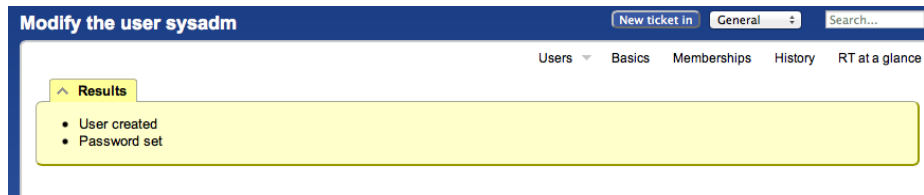


Figure 10: User created

- At the top, choose the menu item **Tools => Configuration => Group => Create**

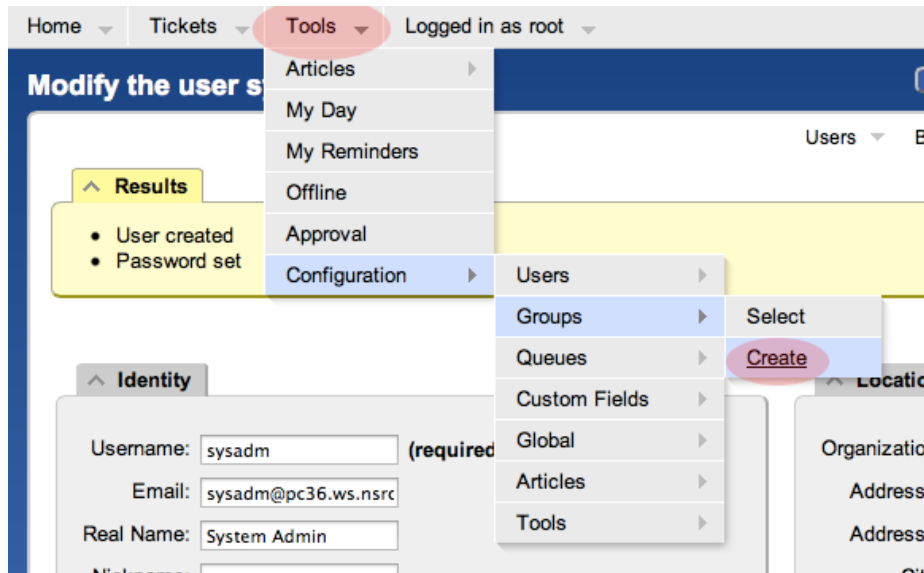


Figure 11: Create group

- Fill in the name: **netmgmt**, and add a description, then click on **Create**
- You should see the following result:
- Click on Members (top menu)
- In the **Add members** field (right), type in the name of the user you created in step 3. This is the **sysadm** user. Then click on **Modify Members** (bottom right):

Create a new group

Name:

Description:

☒ Enabled (Unchecking this box disables this group)

[Reset](#)

Figure 12: Create group form

Modify the group netmgmt [New ticket in](#) [Ge](#)

Groups ▾ Basics Members Group f

Results

- Group created
- Group netmgmt: Description changed from (no value) to 'Network Management Administrators' by root

Name:

Description:

☒ Enabled (Unchecking this box disables this group)

[Reset](#)

Figure 13: Group created

Modify the group netmgmt [New ticket in](#) [General](#)

Groups ▾ Basics **Members** Group Rights

Results

- Group created
- Group netmgmt: Description changed from (no value) to 'Network Management Administrators' by root

Name:

Description:

☒ Enabled (Unchecking this box disables this group)

[Reset](#)

Figure 14: Group members

Figure 15: Add member

- You should see this:

Figure 16: Member added

2.7 Exercise 6

RT Configuration: Create a New Queue

- At the top, choose the menu item **Tools => Configuration => Queue**
- Fill in the fields. Let's use the following values and then click on **Create**:

Queue Name: net

Description: Network Problems

Subject Tag: RT: NET

Reply Address: net@pcX.ws.nsrc.org

Comment Address: net-comment@pcX.ws.nsrc.org

Note: Remember to replace pcX with the correct number of your machine

You should see this:

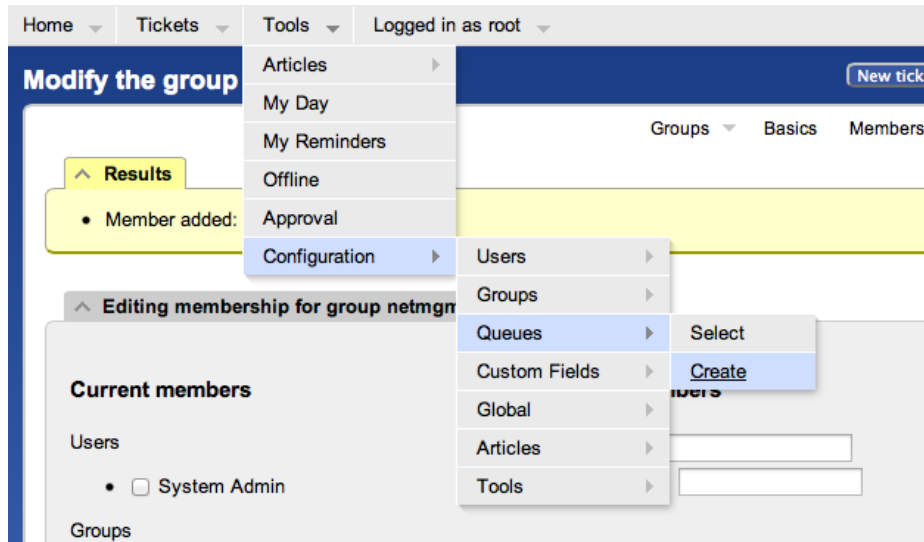


Figure 17: Create queue

The screenshot shows the 'Create a queue' form. At the top, there's a 'New ticket in' button and a 'General' tab. The form has several fields: 'Queue Name' (net), 'Description' (Network Problems), 'Lifecycle' (default), 'Subject Tag' (Request Tracker: NET), 'Reply Address' (net@pcX.ws.nsrc.org), 'Comment Address' (net-comment@pcX.ws), 'Priority starts at' (0), 'Over time, priority moves' (0), 'Requests should be due in' (days), 'Sign by default' (checkbox), 'Encrypt by default' (checkbox), and 'Enabled' (checkbox). There are also sections for 'GnuPG private key(s)' for 'rt@pc36.ws.nsrc.org' and 'rt-comment@pc36.ws.nsrc.org'. A 'Create' button is at the bottom right.

Figure 18: Queue create form

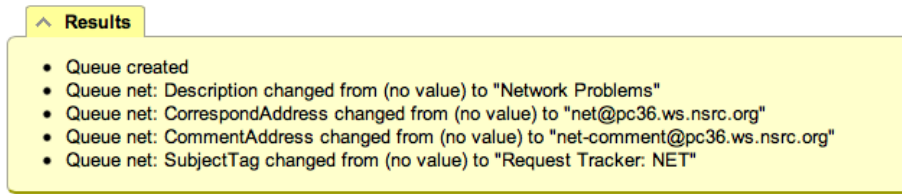


Figure 19: Queue created

2.8 Exercise 7

RT Configuration: Give Rights to our Group on the Queue

From the top menu, select **Tools => Configuration => Queue => Select**
You should see:

Enabled Queues

Select a queue:

#	Name	Description	Address	Priority	DefaultDueIn	
1	General	The default queue	-/-	0-0	0	Enabled
3	net	Network Problems	net@pc36.ws.nsrc.org net-comment@pc36.ws.nsrc.org	0-0	0	Enabled

Figure 20: Enabled Queues

- Select **net** (click on it) then choose **Group Rights** (top right)

Configuration for queue net

Queues ▾ Basics Watchers Templates ▾ Scripts ▾ Ticket Custom Fields Transaction Custom Fields **Group Rights** User Rights

Queue Name:

Description:

Lifecycle:

Subject Tag:

Reply Address:
(If left blank, will default to rt@pc36.ws.nsrc.org)

Comment Address:
(If left blank, will default to rt-comment@pc36.ws.nsrc.org)

Priority starts at: Over time, priority moves toward:
requires running rt-crontool

Requests should be due in: days.

☐ Sign by default ☒ Enabled (Unchecking this box disables this queue) ☐ Encrypt by default

Figure 21: Group rights

The following page should look like this:

Note the three categories: **General rights**, **Rights for Staff**, **Rights for Administrators**

Here, we want to give **Everyone** (including people who are not yet known to RT) some privileges, but only the minimum required. These are found under **General Rights**, and are the following:

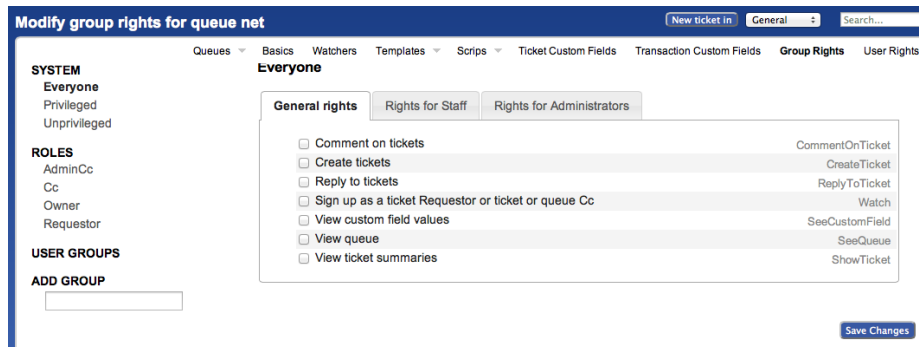


Figure 22: Group rights overview

- Create tickets (CreateTicket)
- Reply to tickets (ReplyToTicket)
- View queue (SeeQueue)
- View ticket summaries (ShowTicket)

So start by selecting these 4 privileges by checking the 4 boxes in your browser. Notice that **Everyone** on the left is already highlighted.

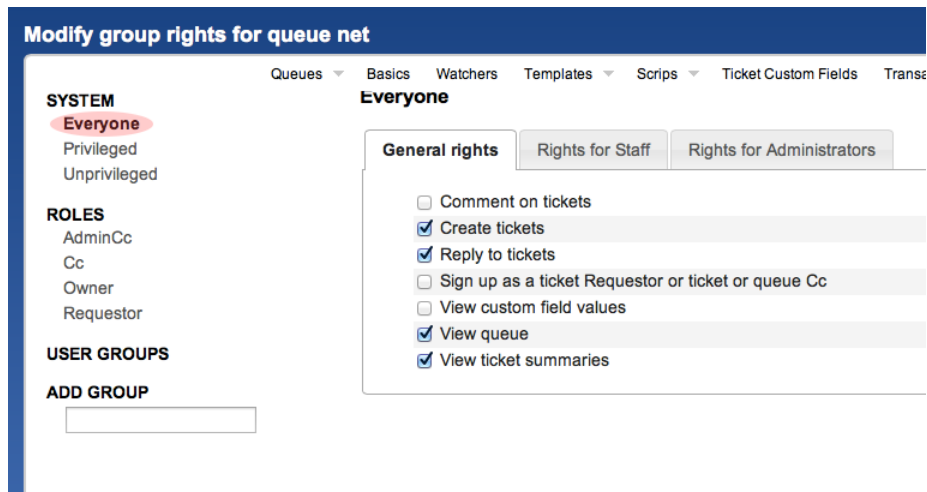


Figure 23: Modify group rights

Now, click **Save Changes** (bottom right) to make sure the changes are applied. Staying on the same page, we're going to now give the **netmgmt** Group all rights...



Figure 24: Saved rights

To do this, first type in the name of the group in the **ADD GROUP** field in the lower left:

SYSTEM

Everyone

Privileged

Unprivileged

ROLES

AdminCc

Cc

Owner

Requestor

USER GROUPS

ADD GROUP

netmgmt

Add rights for this group: netmgmt

General rights Rights for Staff Rights for Administrators

☐ Comment on tickets

☐ Create tickets

☐ Reply to tickets

☐ Sign up as a ticket Requestor or ticket or queue Cc

☐ View custom field values

☐ View queue

☐ View ticket summaries

Figure 25: Add rights to group

Now check **ALL** the boxes in **General Rights**, **Rights for Staff**, **Rights for Administrators**.

Once this is done, press the **Save Changes** button on the bottom right of the page. You should see:

This is after having selected items. Remember to press **Modify Group Rights** after selecting the new rights. Once you press the **Modify Group Rights** button you will see a bunch of this:

2.9 Exercise 8

RT Configuration: Log in as sysadm

SYSTEM
Everyone
Privileged
Unprivileged

ROLES
AdminCc
Cc
Owner
Requestor

USER GROUPS

ADD GROUP

Add rights for this group: netmgmt

General rights **Rights for Staff** Rights for Administrators

- ☒ Delete tickets
- ☒ Forward messages outside of RT
- ☒ Modify custom field values
- ☒ Modify tickets
- ☒ Own tickets
- ☒ Sign up as a ticket or queue AdminCc
- ☒ Steal tickets
- ☒ Take tickets
- ☒ View exact outgoing email messages and their recipients
- ☒ View ticket private commentary

Figure 26: All rights selected

^ **Results**

- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted
- Right Granted

Figure 27: Rights granted

Log out of RT (top menu, select the item **Logged in as root => Logout**)

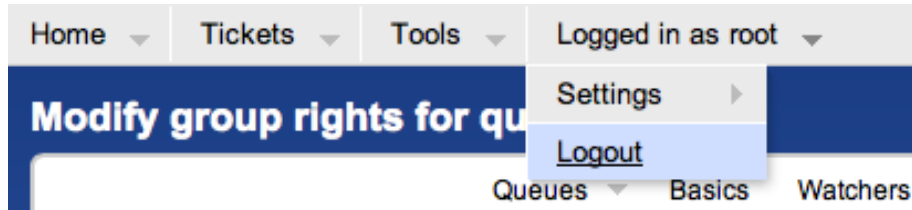


Figure 28: Logging out

Now log back in as the **sysadm** user you have created:

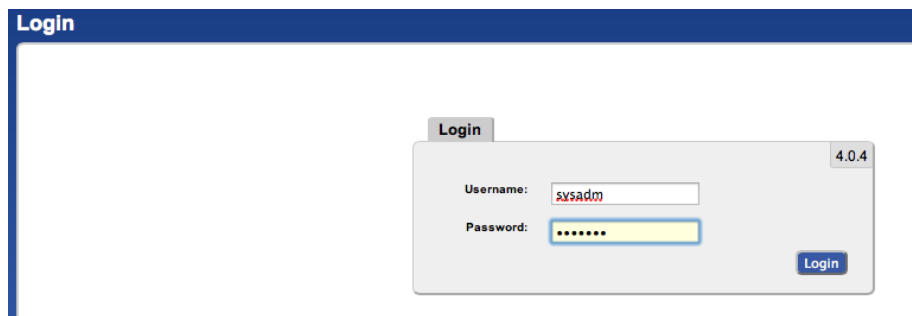


Figure 29: Logging in as sysadm

You should see the following:

At this point RT has been properly configured for initial operation. Now we must configure email properly to talk with our new **net** queue in RT.

2.10 Exercise 9

RT Configuration: Email

RT will work with the MTA (Mail Transfer Agent) of your choice. In our case we are using Postfix configured to run as an MTA for an <<**Internet Site**>> - that is, to deliver email locally and remotely using SMTP.

Edit the file `/etc/aliases`

```
$ sudo editor /etc/aliases
```

Add the following two lines at the end of the file (copy and paste!):

```
net-comment: "|/usr/bin/rt-mailgate --queue net --action comment --url http://localhost/rt/"
net:         "|/usr/bin/rt-mailgate --queue net --action correspond --url http://localhost/rt/"
```

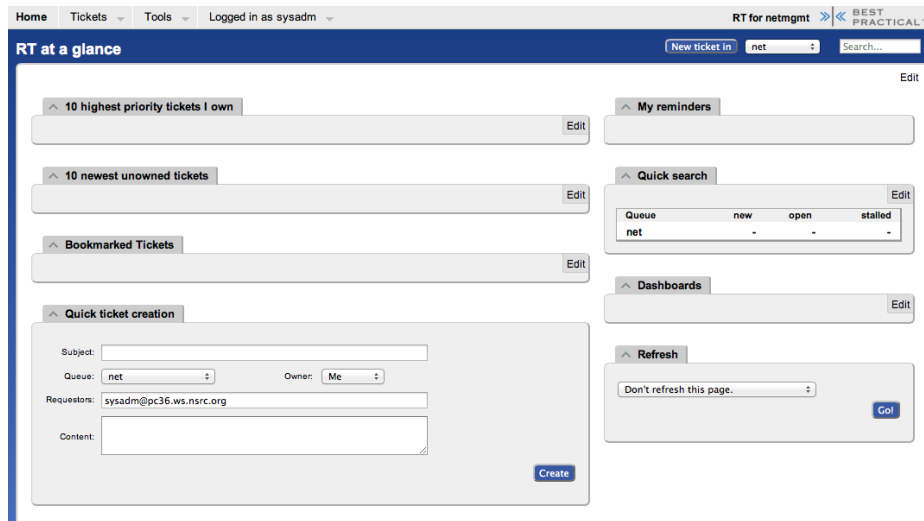


Figure 30: Main page view for sysadm

Save the file and exit. Some editors might cause the above-lines to become multiple lines. Be sure that you only have two new lines in your `/etc/aliases` file after copying and pasting in the text above.

Now run the command:

```
$ sudo newaliases
```

2.11 Exercise 10

RT Configuration: Create an Email and Tickets

Let's create an email and send it to the RT **net** queue. Do this as the **sysadm** user (not as **root**):

If you are currently **root**:

```
# su - sysadm
```

```
$ echo "Problem with my router" | mail -s "Router problem" net@pcX.ws.nsrc.org
```

Remember to replace pcX with the correct name of your server.

Now check that you have received email:

```
$ mutt
```

You should see an email from Request Tracker acknowledging that your ticket has been created.

The mail should say something similar to this:

```
Date: Fri, 9 Nov 2012 00:29:27 +0000
From: Network Problems via RT <net@pcX.ws.nsrc.org>
To: sysadm@pcX.ws.nsrc.org
Subject: [Request Tracker: NET #1] AutoReply: Router problem
```

Greetings,

This message has been automatically generated in response to the creation of a trouble ticket regarding:

"Router problem",
a summary of which appears below.

There is no need to reply to this message right now. Your ticket has been assigned an ID of [Request Tracker: NET #1].

Please include the string:

[Request Tracker: NET #1]

in the subject line of all future correspondence about this issue. To do so, you may reply to this message.

Thank you,

net@pcX.ws.nsrc.org

If, for some reason, you do not see mail try taking these steps, and then send the mail again:

```
$ sudo touch /var/mail/sysadm
$ sudo chown sysadm:mail /var/mail/sysadm
```

2.12 Exercise 11

RT Configuration: View, Reply, Resolve, Reopen Tickets in Request Tracker

Go back to your web browser where you are logged in to RT as the sysadm user and click on the **Home** menu item (top left).

You should then be presented with an updated view with the current ticket:

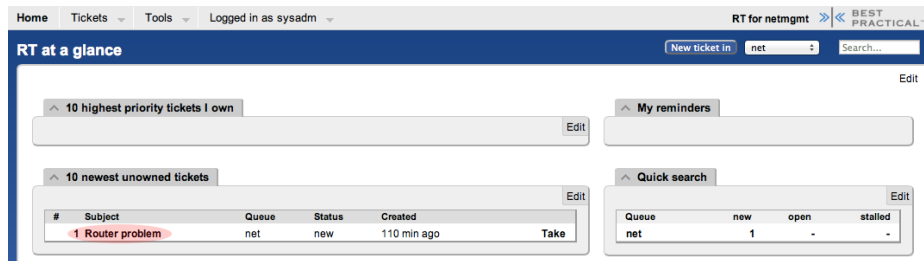


Figure 31: Main page - ticket overview

Now, click on the ticket subject.

You will see many pieces of information about the ticket. Scroll to the bottom of the page.

Here you can **Reply** to the ticket:

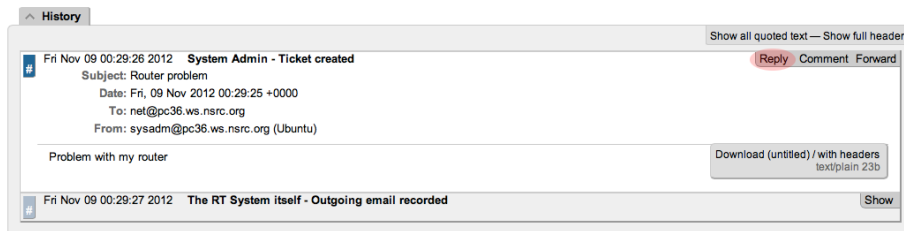


Figure 32: Display ticket

Go ahead and type in a reply, set the **Status** of the ticket to **Resolved** (upper-right drop-down menu), and then click on **Update Ticket** (bottom-right):

You should see this:

The ticket is currently Resolved but you can reopen the ticket via the RT web interface at any time, or if the original ticket creator (**sysadm** in this case) replies to the resolution email RT sent, then the ticket will be reopened.

View the history at the bottom of the page to see that the ticket is currently resolved:

If you went back to your terminal session as the sysadm user and typed:

```
$ mutt
```

and responded to the email generated from Request Tracker, then your ticket status will change. You can see this by reloading the RT web page for the ticket and viewing the history at the bottom of the page:

Update ticket #1 (Router problem) New ticket in Search...

Display History Basics People Dates Links Jumbo Reminders Actions ☆

Message

One-time Cc:

One-time Bcc:

Sign ☐ using Queue's key Encrypt ☐

Subject: Router problem

Message: Search for Articles matching

Include Article: **Go**

B **I** **U** **abc**

Format Font Size

On Fri Nov 09 00:29:26 2012, sysadm wrote:
> Problem with my router

Hello! We think the problem should be fixed now.

body strong

Attach: no file selected

Ticket and Transaction

Update Type:

Status: **resolved**

Owner:

Worked: Minutes

Figure 33: Replying to ticket

#1: Router problem New ticket in Search...

Display History Basics People Dates Links Jumbo Reminders Actions ☆

Results

- Message recorded
- Ticket 1: Status changed from 'new' to 'resolved'

Ticket metadata

The Basics

Id: 1

Status: resolved

Priority: 0/

Queue: net

Reminders

New reminder:

Subject:

Owner:

Due:

Figure 34: Reply sent

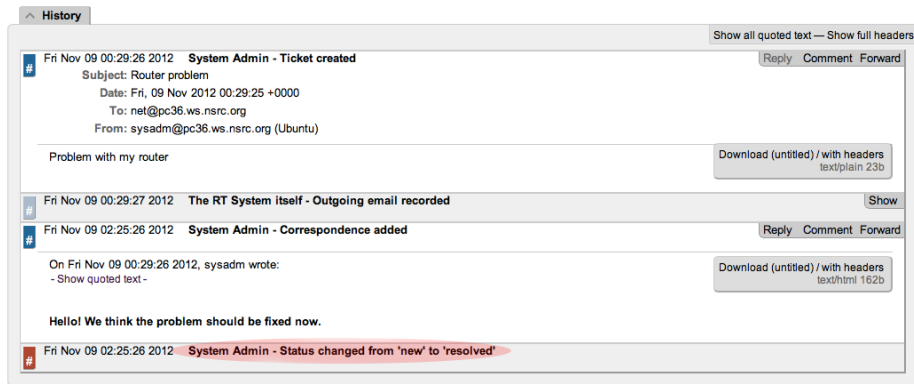


Figure 35: View history

Using Mutt to Reply to an Email

- After typing `mutt`, select the message you want to respond to using the arrow keys
- Press the `<<*>` key for `<<*>reply`.
- At the bottom of the page you will see, `To: System Admin via RT <net@localhost>` - Press ENTER to continue
- Next you'll see a suggested `<>` line. Press ENTER to choose what is shown.
- When you see, `Include message in reply? ([yes]/no):` press ENTER to include the message.
- Now you will be placed in an editor - possibly `vi`. Type in your response. We suggest to answer below the original message.
- Save and exit from the text editor (`:wq` in `vi`).
- The next screen to appear looks complicated but simply press the `y` key to send the message.
- That's it. You are done. You can press `q` to exit Mutt at this point if you wish.

You now have a functioning RT instance with email integration!

You can experiment a bit. Now, this is not a very realistic setup, since you are communication with yourself! But in fact, other users in the classroom can send you email:

- Make sure they have configured their mail software (`sudo apt-get install postfix` then accept the defaults)
- Have the users send a mail to you, for example:

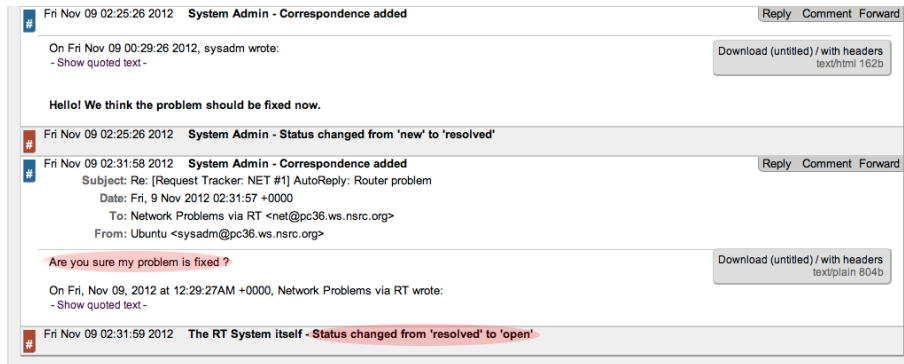


Figure 36: Ticket history showing reply

```
echo "Where is my cat ?" | mail -s "Missing cat" net@pcX.ws.nsrc.org
```

- This should automatically create tickets in the **net** queue on your pc “pcX”
- verify that you do receive the tickets!

2.13 Adding Watchers to a Queue

We are still missing an important feature: it’s not practical to have to log into RT to check if tickets have arrived. It would be much more convenient if we received an email every time a problem request had been submitted, no?

- To do these exercises you need to log out as the sysadm user and log back back in to Request Tracker as the root user.
- Now log back in as root:

Now to receive an email every time a request is submitted we’re going to modify the Queue settings for **net**:

- From the top menu, select **Tools => Configuration => Queue => Select**

From the **Queue** page, select the **net** queue by clicking on its name, and you select the **Watchers** menu option at the top:

You should now see this:

Under **New watchers**, enter the group name **netmgmt** in the field: <>, as such:

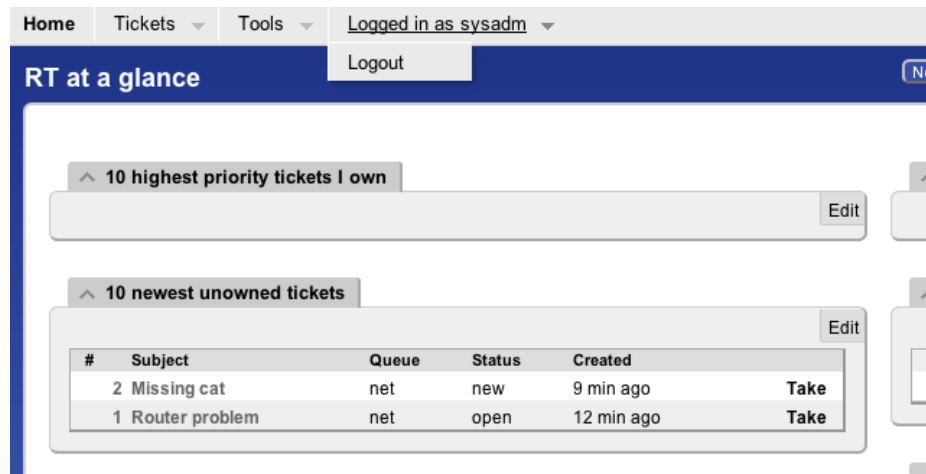


Figure 37: Logout as sysadm

The screenshot shows the 'Login' form in the RT interface. It has a title 'Login' and a version number '4.0.4' in the top right corner. The form contains two input fields: 'Username:' with the value 'root' and 'Password:' with a masked password represented by seven dots. A 'Login' button is located at the bottom right of the form.

Figure 38: Log in as root

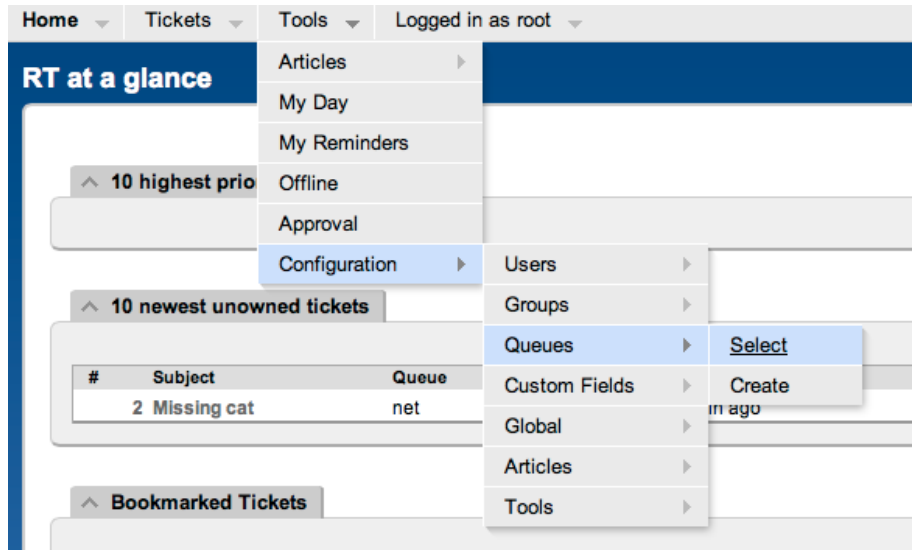


Figure 39: Select queue

The screenshot shows the 'Configuration for queue net' page. The 'Watchers' tab is selected. The form contains the following fields and options:

- Queue Name:
- Description:
- Lifecycle:
- Subject Tag:
- Reply Address: (If left blank, will default to rt@pc36.ws.nsrc.org)
- Priority starts at:
- Requests should be due in: days.
- ☐ Sign by default
- ☒ Enabled (Unchecking this box disables this queue)

Figure 40: Queue watchers

People related to queue net New ticket in General Search...

Queues ▾ Basics **Watchers** Templates ▾ Scripts ▾ Ticket Custom Fields Transaction Custom Fields Group Rights User Rights

Current watchers

Cc:

- none

(Check box to delete)

AdminCc:

- none

(Check box to delete)

[Reset](#)

New watchers

Find people whose

Username ▾ matches ▾ [Go!](#)

Find groups whose

Name ▾ matches ▾ [Go!](#)

Add new watchers:

Users
No principals selected.

Groups
No principals selected.

If you've updated anything above, be sure to [Save Changes](#)

Figure 41: Modify queue watchers

New watchers

Find people whose

Username ▾ matches ▾ [Go!](#)

Find groups whose

Name ▾ matches ▾ [Go!](#)

Add new watchers:

Users

No principals selected.

Groups

No principals selected.

Figure 42: New watchers

And click on **Go!**

RT will search for all groups matching **netmgmt**. Of course there is only one right now, which we created earlier. RT finds it and displays the following:

New watchers

Find people whose

Username matches **Go!**

Find groups whose

Name matches **Go!**

Add new watchers:

Users
No principals selected.

Groups

- ☒ - netmgmt (Network Management Administrators)
Cc
AdminCc

Figure 43: Matched groups

Notice how we select **AdminCc** from the pull down menu **Groups** next to **netmgmt**. Do this and click on **Save Changes** at the bottom right.

The result should look like this:

^ **Results**

- Added netmgmt to members of AdminCc for this queue.

Figure 44: Watchers modified

What does it mean ? Well, ask another user to send you a mail, like before, but this time you should receive a mail from RT with the ticket notification - run `mutt as sysadm`.

A bit later we will extend the use of RT by integrating it with other Network Monitoring software using the `rt-mailgate` facility that we have already configured in the `/etc/aliases` file.

2.14 Exercise 12

Finding a ticket once it's closed.

After a ticket has been resolved or closed may notice that it disappears from your Queue. Actually finding a closed ticket requires a few steps. First, click on **Tickets => New Search** on the top menu in RT:

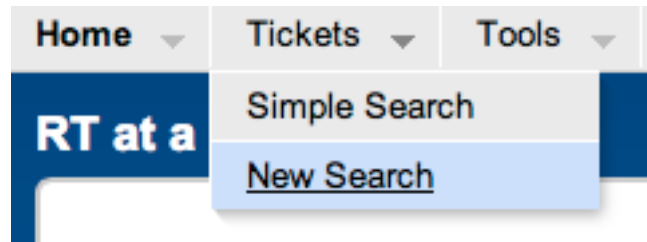


Figure 45: Search tickets

and you will see a screen like this:

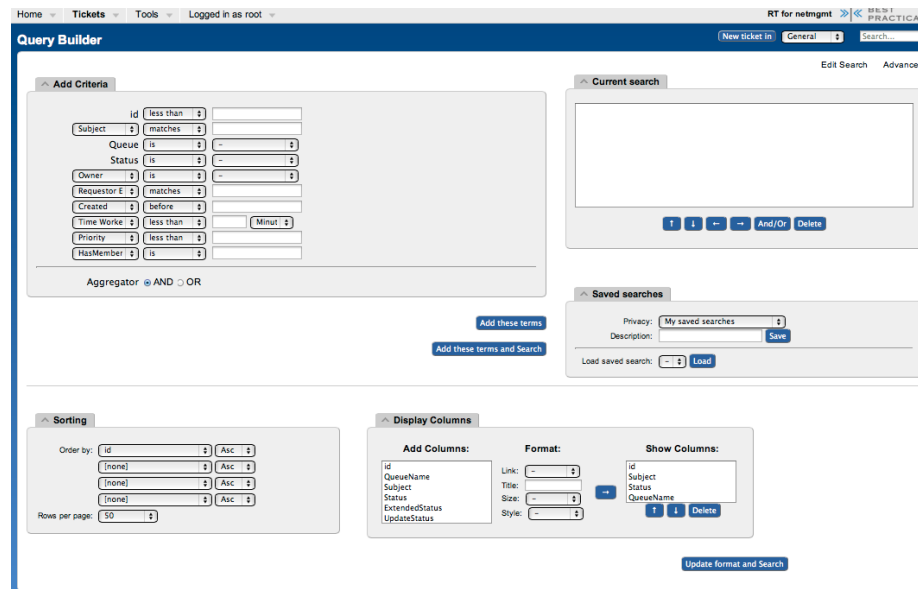


Figure 46: Ticket search form

If you are going to search for items in a queue and there are already items in the <<**Current search**>> box, then you should delete the items from the <<**Current search**>> box first. Next in the <<**Add Criteria**>> box in the <<**Queue**>>" choice select the <<**net**>> queue from the drop-down menu (see below):

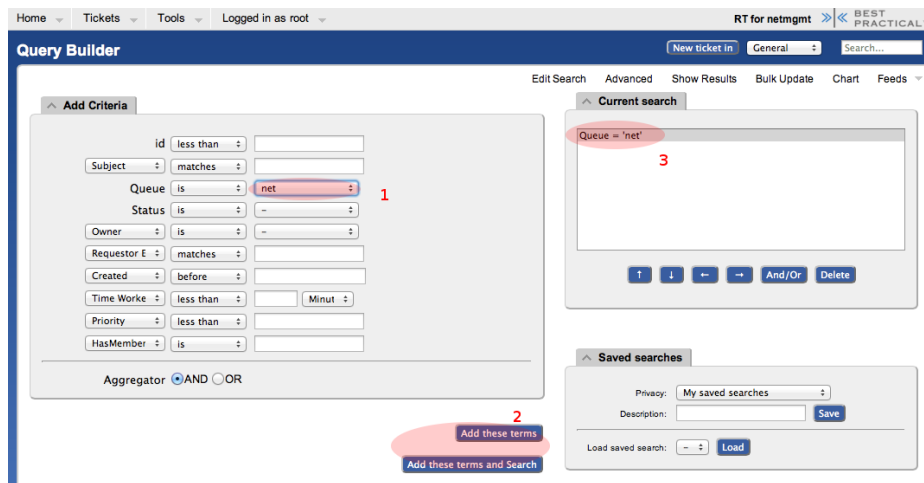


Figure 47: Adding search terms

Click on <<**Add these terms**>> or <<**Add these terms and Search**>> - If you just do <<**Add these terms**>> then go to the bottom of the page and click on <<**Update format and Search**>> - RT will keep the search terms until you delete them at a later time.

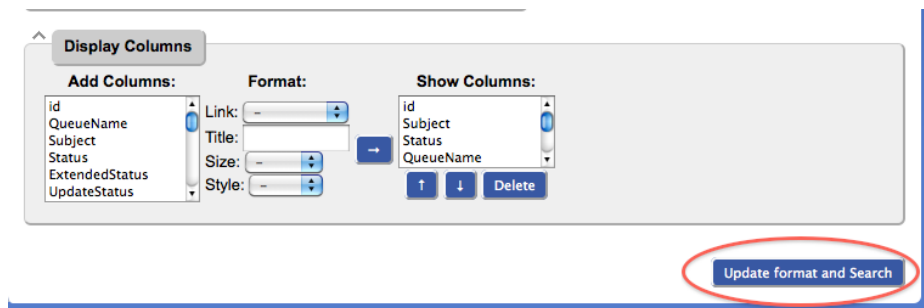


Figure 48: Execute search

And the results of your search will look something like this and you will be able to view tickets that have been closed, resolved, etc. Clearly there will be more tickets in the results over time:

Home ▾ Tickets ▾ Tools ▾ Logged in as root ▾				
Found 3 tickets New ticket in				
Edit Search Advanced Show Result				
#	Subject Requestors	Status Created	Queue Told	Owner Last Updated
1	Router problem sysadm@pc36.ws.nsrc.org	resolved 3 hours ago	net	Nobody 49 min ago
2	Missing cat nsrc@noc.ws.nsrc.org	new 45 min ago	net	Nobody 45 min ago
3	Missing cat nsrc@noc.ws.nsrc.org	new 10 min ago	net	Nobody 10 min ago

Figure 49: Search results