



QPCR: APPLICATION FOR REAL-TIME PCR DATA MANAGEMENT AND ANALYSIS

INSTALLATION AND ADMINISTRATION MANUAL (Version 0.9.10)

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Chapter 1

Installation

1.1 Important information

The installation of QPCR should be performed by users with profound IT experience. Otherwise ask your system administrator to perform the installation for you. The application is not intended to be installed on client machines. We suggest to install one instance for your group on a server where users connect to by a standard Web browser. Additionally you can request an account on the server hosted by the TU Graz.

1.2 Installation overview

QPCR is a web-based JEE application which consists of the following components. The **QPCR** application and the **Genome Usermanagement System** are both delivered in a single JBoss application server (see <http://www.jboss.org>). These Web applications access an **RDBMS** (relational database management system e.g. PostgreSQL) which stores all the QPCR and Genome Usermanagement specific data. Only the files imported in QPCR are stored separately in a dedicated application data directory which can be specified during the installation process ("Path for internal file storage"). Authentication and authorization within QPCR is handled externally by a dedicated **Usermanagement System**.

The installation itself is performed in 3 main stages which should not take more than 15 minutes by an experienced system administrator:

- Installation preparations:
 - Prerequisites and planning of the installation
 - Creation of a database user and of two databases (one for QPCR, one for the Genome Usermanagement system) which can be accessed by this user
 - Optional creation of a local system user under which QPCR and its services should be installed and run
- Installation using the graphical installation wizard
- Initialization and user creation:

- Starting and stopping the services
- Creation of QPCR users and assignment of roles in the Usermanagement System

1.3 Installation preparations

1.3.1 Database

Before you start with the QPCR installation you must have installed and started either a **PostgreSQL** (visit <http://www.postgresql.org> for more information) or an **Oracle** database instance which has its TCP/IP connectivity enabled. It must be reachable by the host which is running QPCR.

In order to install the application you need to setup two database users and their tablespaces.

- A user to install the usermanagement system
- A user to install the QPCR system

Please ensure that you know the username and the password to access the database. They will be needed during the installation.

1.3.2 Java

Additionally to the running database a **Sun Java Development Kit of version 1.5 or higher** must be installed. You can test your JDK installation it with the following lines in the command line:

```
#
# determine the version of your Java installation in your environment
#
[ilap@obeline ~]$ java -version
java version "1.6.0_05"
Java(TM) SE Runtime Environment (build 1.6.0_05-b13)
Java HotSpot(TM) Client VM (build 10.0-b19, mixed mode, sharing)
```

1.3.3 Discspace

Finally you must provide enough disk space for storing the imported data associated within QPCR projects. The **adequately dimensioned disk system** must be accessible as a local directory path which by default is set to a subdirectory of the QPCR installation path.

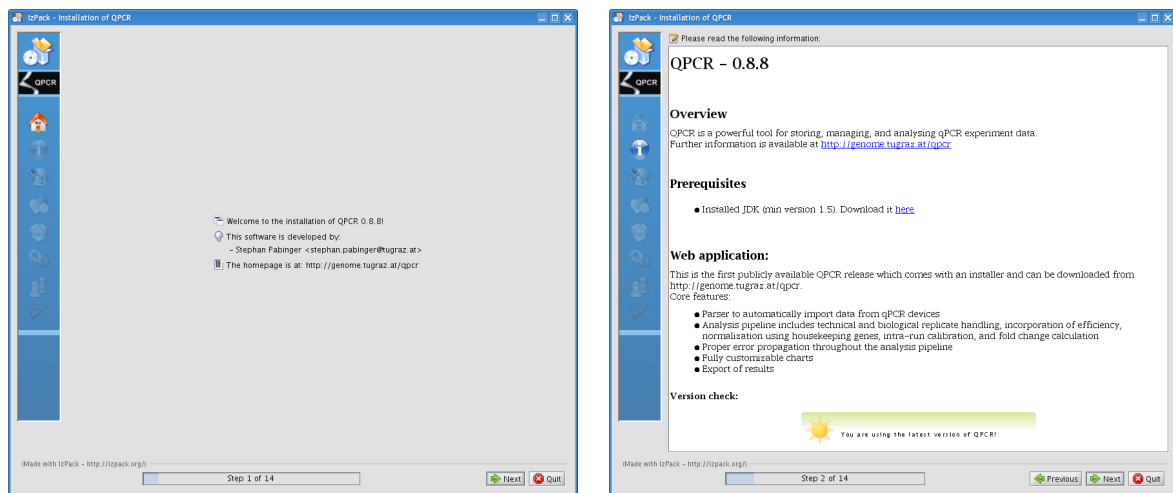
1.4 Installation

First download the newest version of QPCR from <http://genome.tugraz.at/qpcr> and store it in a local directory. After that start the graphical installer of QPCR and fill out the required parameters:

Linux/Max: `java -jar rtpcr-0.9.10-install.jar`

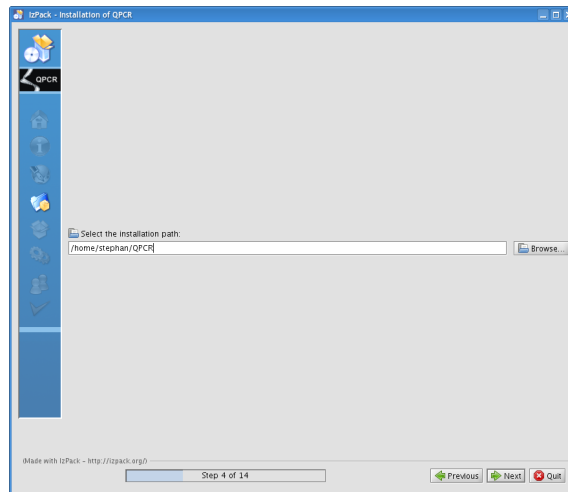
Windows: doubleclick on `rtpcr-0.9.10-install.exe`

Attention: The installer has a graphical user interface and should therefore be started in a graphical environment which is either Windows or the X environment under Linux/Unix systems. In order to avoid installing X on a server you can also do X- forwarding using SSH to get the user interface redirected to your local machine.



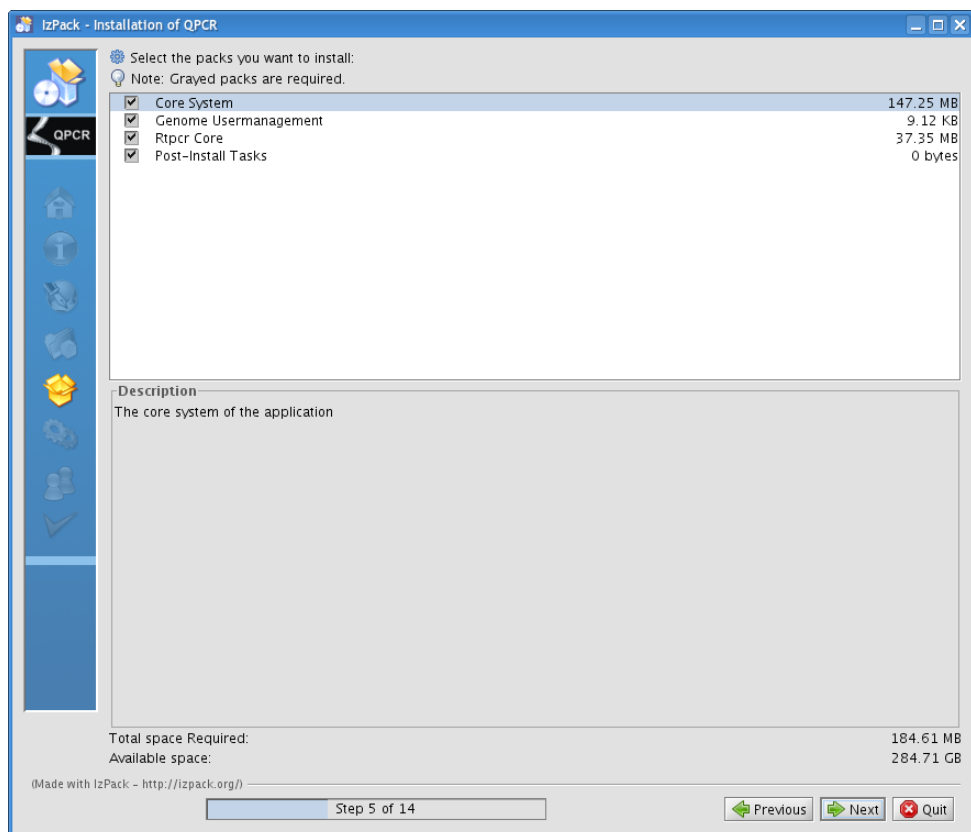
The first two screens show you general information about QPCR, including the current version and the features of the application.

After accepting the license agreement you have to specify the directory path, where QPCR should be installed. It is recommended to install it in a single central place, preferably under the user home directory, and to include this directory into the general backup environment in order to avoid the loss of data.

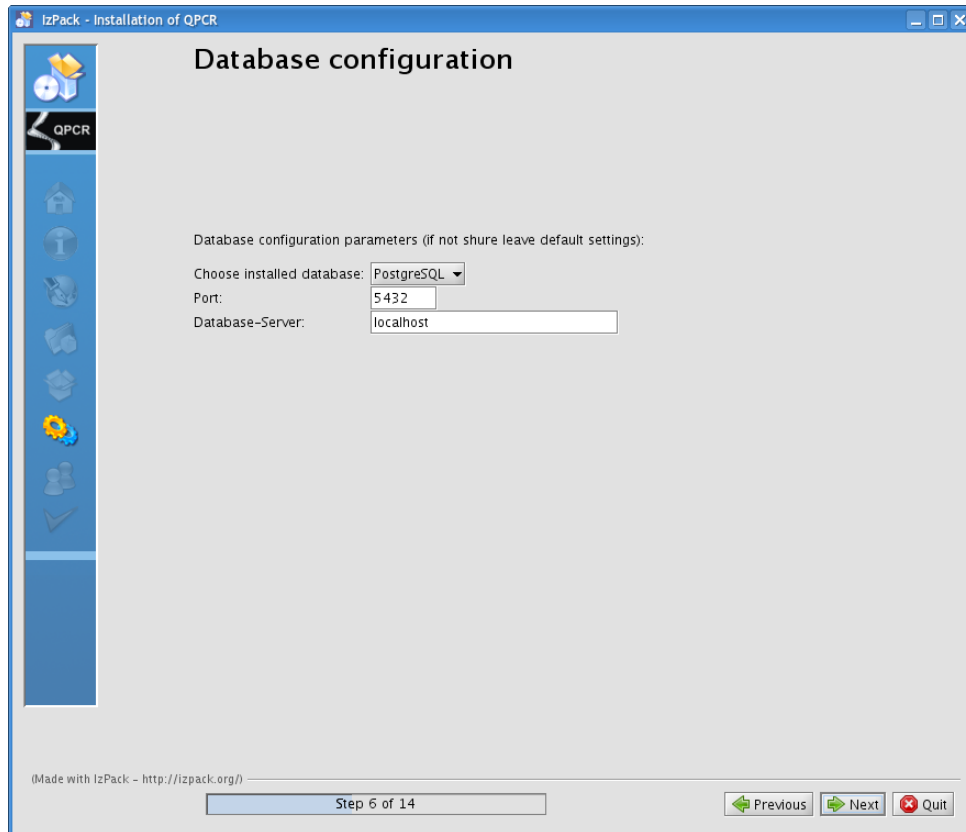


The next wizard screen shows you the package selection dialog. Currently there are only mandatory packages available which can therefore not be deselected.

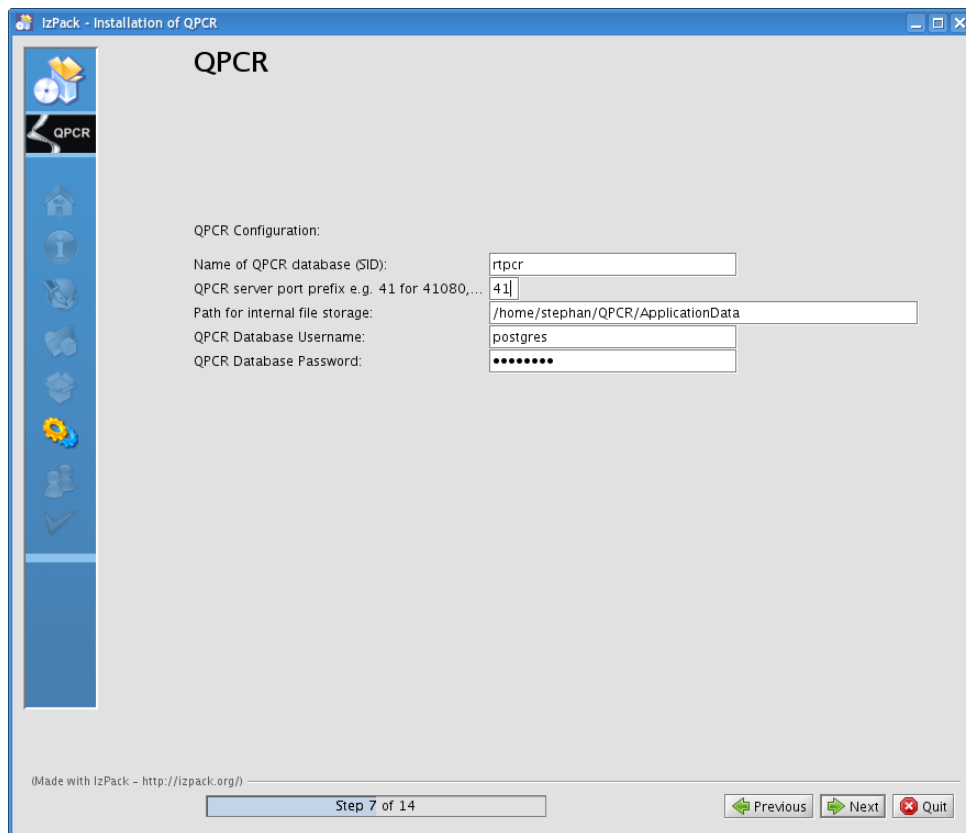
- Core System: contains the JBoss application server.
- Genome Usermanagement: the GenomeAAS - a full featured usermanagement - is a JEE application and gives you a versatile web interface for all tasks regarding the user administration. Besides the web-interface it provides a Samba/Linux system user authentication and LDAP-support.
- Rtpcr Core: contains the JEE application which provides the functionality of QPCR.



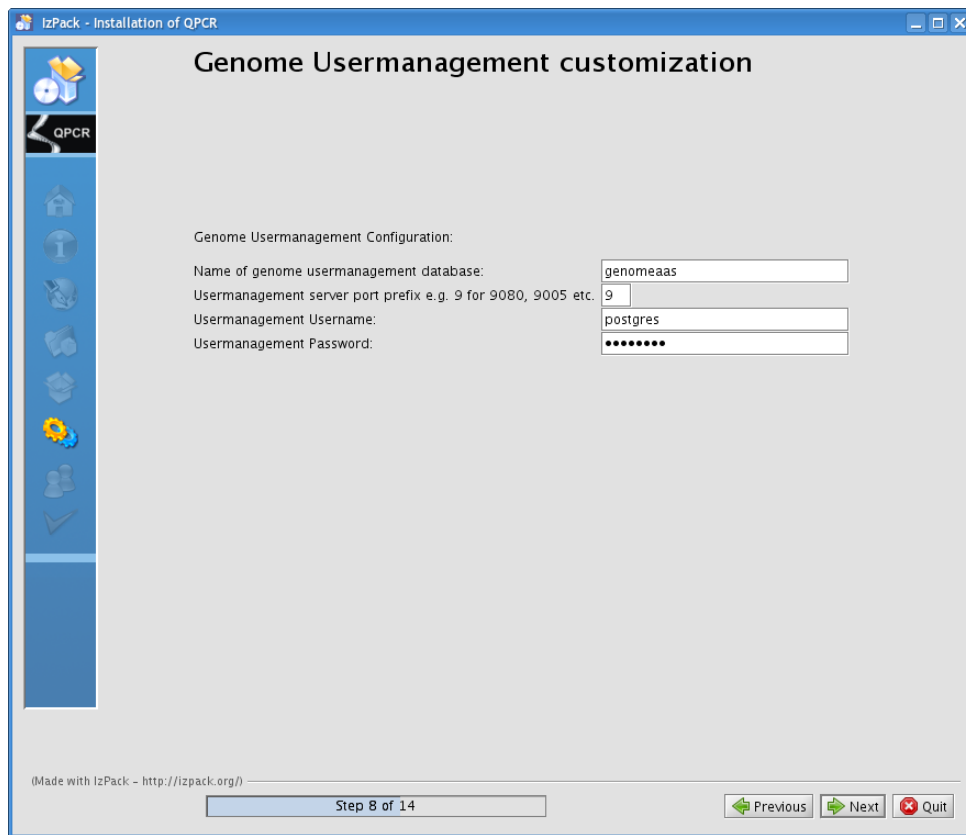
The following wizard screen gives you the possibility to specify the database connection. You can choose between PostgreSQL and Oracle as the used database (depending on your existing database infrastructure). Next you need to specify the port settings and the hostname of the database server.



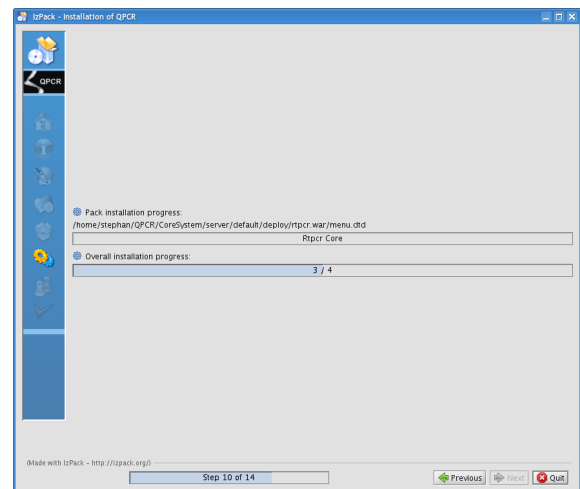
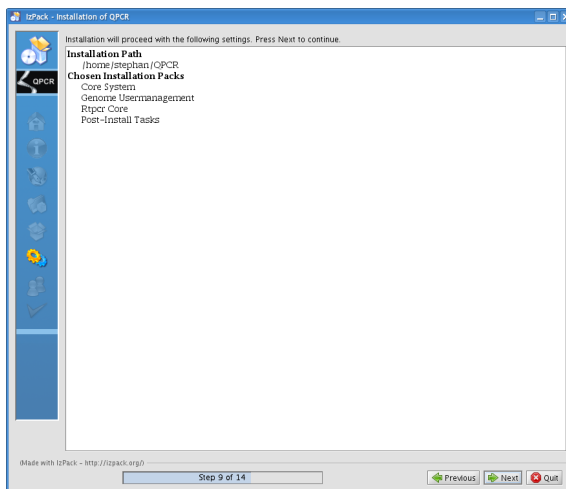
The next wizzard screen is used to define the QPCR application configuration. First you need to specify the name of the database where the QPCR data is stored (if you are using an Oracle database insert the SID). Next you can specify the selected port prefix that is used for the QPCR application. The path for internal file storage specifies the location where files that are uploaded to the system are stored. Please keep in mind that this folder contains your precious data and should therefore be included into your backup environment. Finally you need to specify the username and password of the database used for the QPCR application.



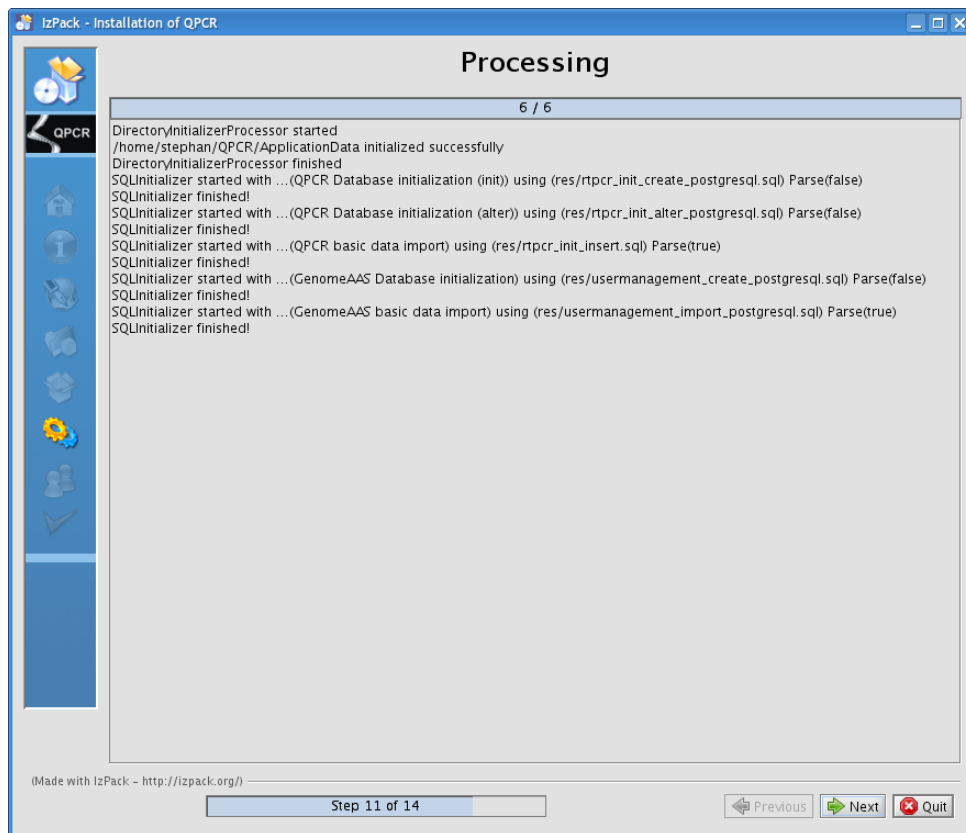
The Genome Usermanagement configuration is similar to the QPCR application configuration. You need to define the name of the database (if you are using Oracle the SID you defined in the previous page will be used), the port prefix, username, and password of the database used for the Genome Usermanagement.



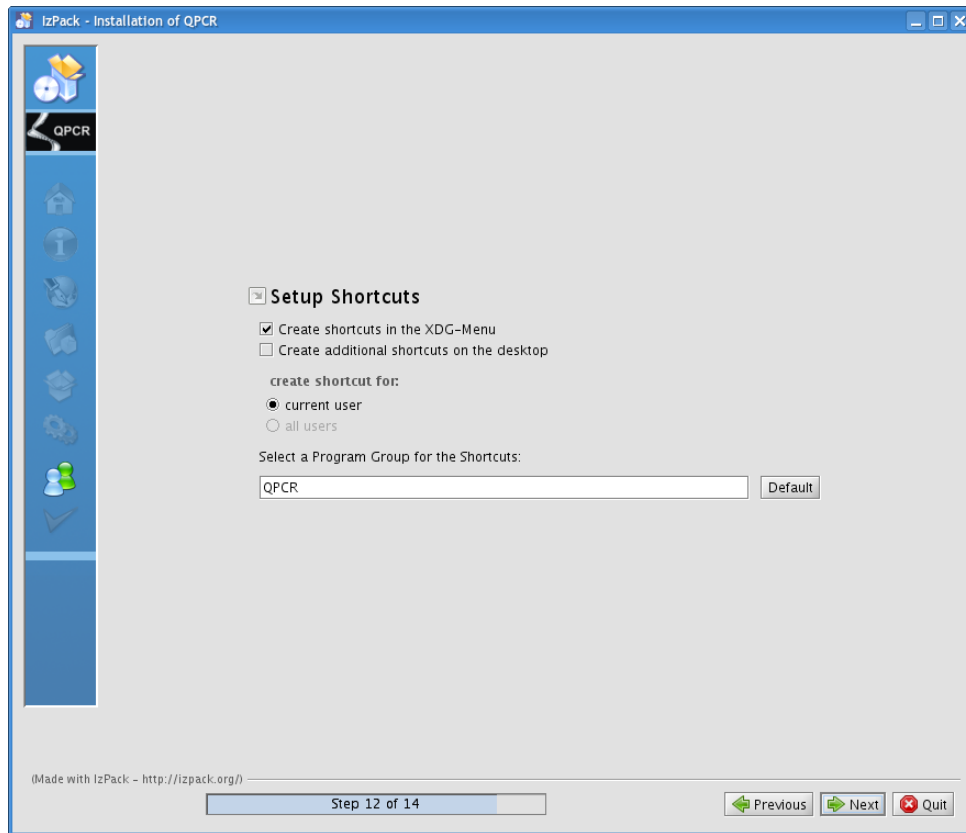
After this customizations you get a summary of the selected installation and with “Next” you initiate the installation process.



The following “Processing” screen initializes the configuration according to the wizard inputs and performs the database schema initialization for both the QPCR application and the Genome Usermanagement system. If you want to perform additional changes after the installation you have to perform the changes manually by using an editor and changing the appropriate properties files.



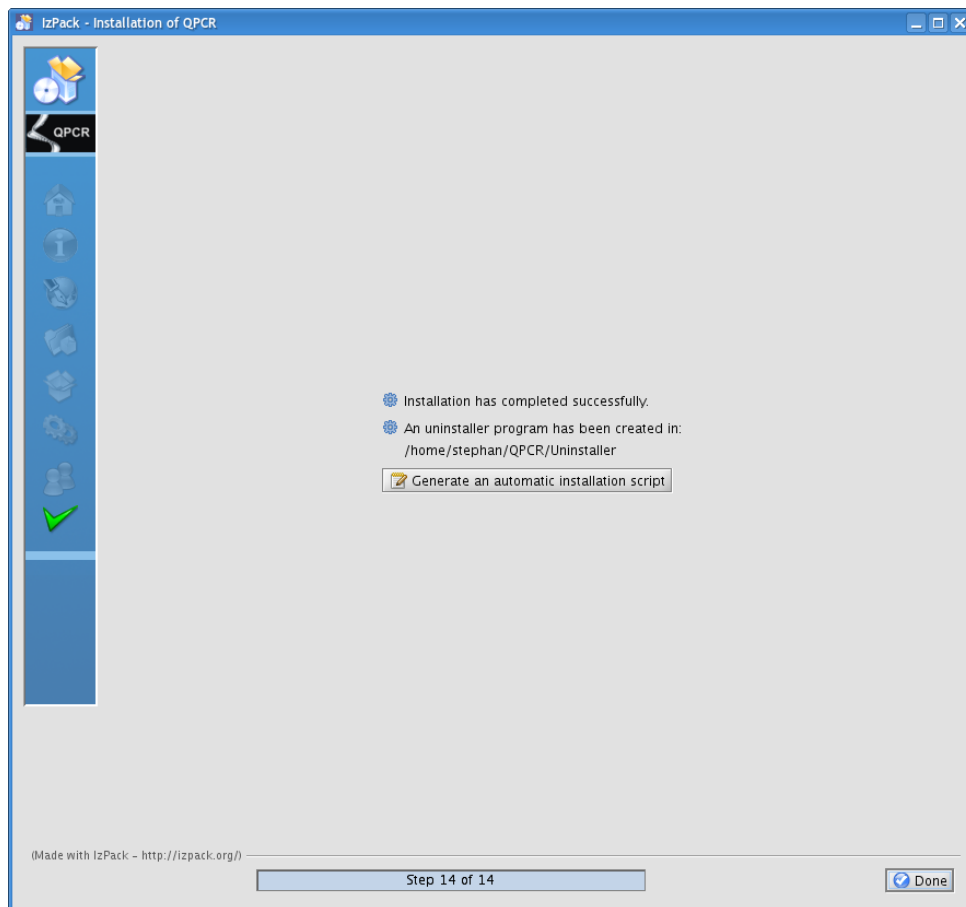
If the installation and initialization process is completed, local shortcuts for starting and stopping QPCR and the Genome Usermanagement can be generated using the next screen. This detects the platform specific settings of Linux and Windows automatically.



The QPCR summary page displays useful information about the installed applications. It describes how you can start the system, displays the browser links, and specifies the path of the log files.



At the final wizard screen you can generate a configuration file for automatic installation without demanding user interaction (see section “FAQ: How to perform an automatic installation?”).



Attention: In general the default values of the installation wizard should be fine and should lead to a working installation of QPCR. If you don't understand the name of the configuration settings simply leave them as they are or as your local system administrator.

1.5 Starting QPCR

If you have chosen to install the shortcuts you can start the necessary services for QPCR by clicking at the Shortcuts "Genome Usermanagement start" and "QPCR start" generated in your system menus. If you want to do it automatically at system startup you have to integrate the following scripts in the boot configuration.

Linux/Unix:

```
<iLAP Installation Path>/CoreSystem/jboss_init_usermanagement.sh
```

```
<iLAP Installation Path>/CoreSystem/jboss_init_rtpcr.sh
```

If all applications are successfully started the web applications for Genome Usermanagement and QPCR should be accessible under specified ports at localhost. For the default settings the URLs are:

```
http://localhost:41080/rtpcr/
```

```
http://localhost:9080/UsermanagementWeb/
```

Chapter 2

Usermanagement administration

2.1 Genome Usermanagement

The Genome Usermanagement is a stand-alone web application and uses it's own features for it's administration. The web-application can be accessed under:

```
http://localhost:<Usermanagement port prefix>080/UsermanagementWeb/
```

2.1.1 Login into the Genome Usermanagement

In order to administer the users of QPCR login as administrator with:

```
Username: admin
```

```
Password: genomeaas-demo
```

Attention: As soon as you are logged in please change the default password of the administrator so that no unauthorized persons can administer your accounts!

In order to allow your users to login into QPCR you have to perform 4 steps:

1. Create once the organizational unit namely "institute" to which your users are belonging to. Most of the time it is the name of your own organization but if you want to subdivide your users in several working groups create them separately.
2. Create the users who should be registered in the usermanagement and assign them to the previously generated institutes.
3. Add the users to the QPCR application
4. Add the users to the group which is allowed to login in QPCR

2.1.2 Creation of an institute within the Genome Usermanagement

An institute can be simply created by clicking first on the institutes menu where create (marked with 1) appears as sub-menu. There you have to fill in the necessary attributes (marked with 2) of your institute and then simply submit the form. After this action in the user creation masks the newly created institute can be selected.

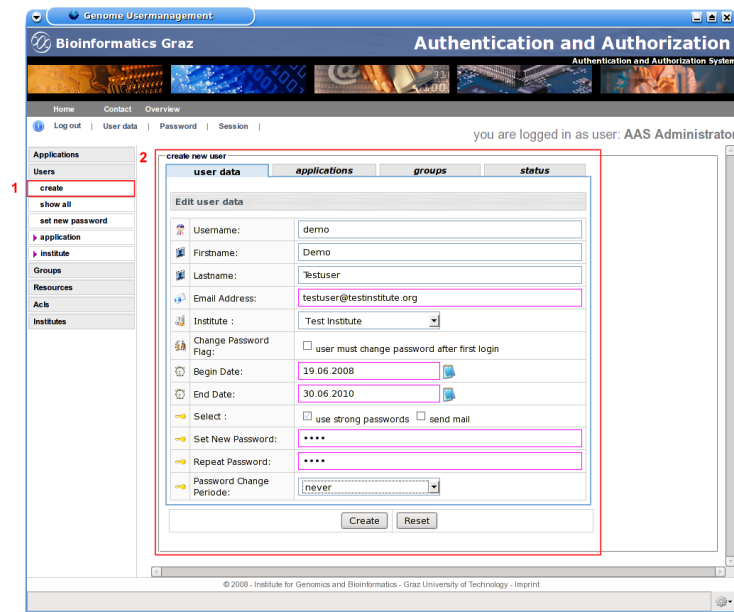
The screenshot displays the 'Genome Usermanagement' web application. The header includes the title 'Bioinformatics Graz' and 'Authentication and Authorization'. A navigation bar contains links for 'Home', 'Contact', and 'Overview'. Below this, a status bar indicates 'you are logged in as user: AAS Administrator'. On the left, a sidebar menu lists 'Applications', 'Users', 'Groups', 'Resources', 'Acis', and 'Institutes'. The 'Institutes' menu is expanded, showing a 'create' option marked with a red '1'. The main content area shows the 'create a new Institute' form, which is outlined with a red box and marked with a red '2'. The form contains the following fields:

	name of institut:	<input type="text" value="Test Institute"/>
	city:	<input type="text" value="Graz"/>
	address:	<input type="text" value="Petersgasse 14"/>
	country:	<input type="text" value="Austria"/>
	email:	<input type="text" value="office@test.institute.org"/>
	telephone:	<input type="text" value="+xx xxx xxxxxxxx"/>
	fax:	<input type="text" value="+xx xxx xxxxxxxx"/>

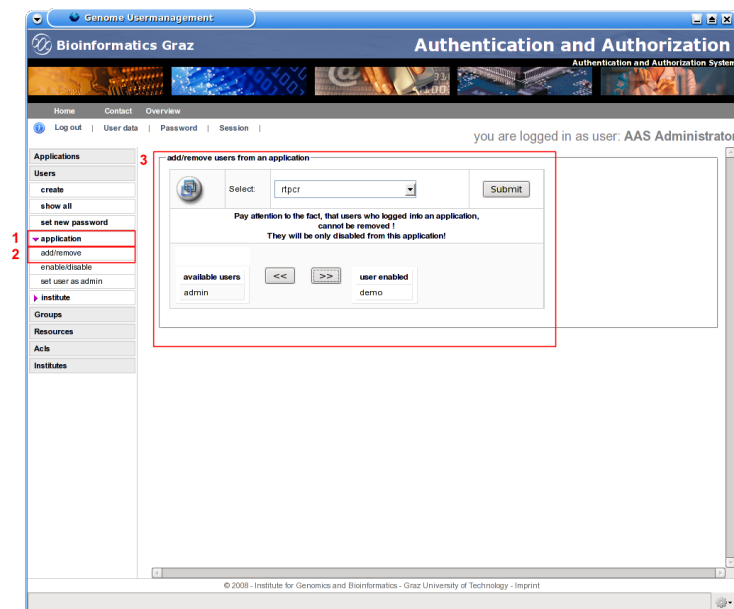
At the bottom of the form are 'Submit' and 'Reset' buttons. The footer of the page reads '© 2008 - Institute for Genomics and Bioinformatics - Graz University of Technology - Imprint'.

2.1.3 Creation of a user account for QPCR within the Genome Usermanagement

The user can be created on the left-hand menu under “Users” and sub-menu “Create” (marked with 1) where you have to fill in the personal data (marked with 2) as well as select the institute the user is belonging to. The creation is executed by pressing “Create”. In this way the user is known to the usermanagement and can login there for changing the password etc.

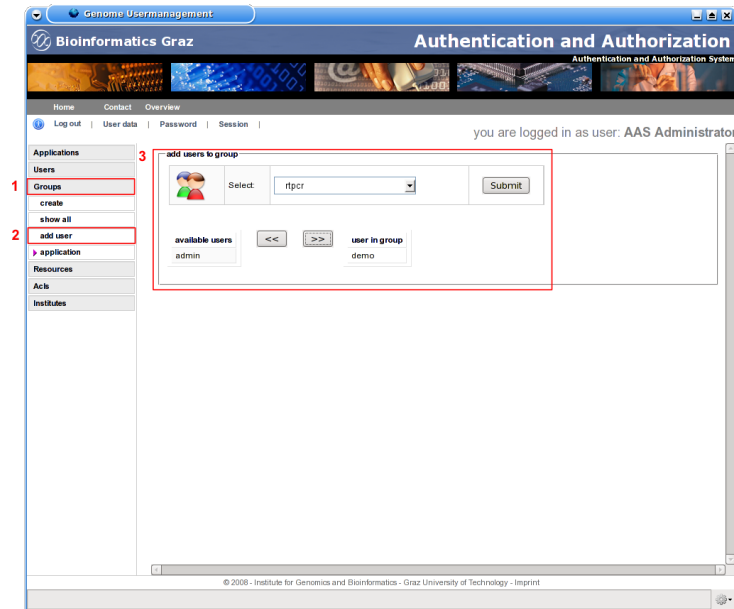


Next it is necessary to add the new user to the QPCR application so that the user is also known to QPCR.



This is depicted in the screen shot above where the user is assigned using the left-hand-menu “Users”, sub-menu “Applications” subsub-menu “add/remove”. With the there appearing selection list *rtPCR* can be selected and the users can be assigned to the application. Last but

not least the user must get the authorizations within QPCR which is assigned by adding the user to the appropriate role group. The basic role a QPCR user must possess is the *rtPCR* role.



After these steps your users should be able to login and work within QPCR.

Chapter 3

Testing QPCR without local installation

3.1 QPCR demo site

If you simply want to get a basic impression about the capabilities of QPCR please visit our site under:

`https://esus.genome.tugraz.at/rtpcr`

User: demo

Password: demo

It will be frequently updated with the latest development version so that you can get an impression in which direction development is going.

Chapter 4

FAQs

4.1 How to perform an automatic installation?

Once you have created the configuration file for automatic installation (e.g.: autoinstaller.xml) you can simply start the installation using:

```
java -jar rtPCR-0.9.10-install.jar autoinstaller.xml
```

4.2 How to uninstall QPCR?

If you really want to uninstall QPCR you can do this by clicking on the created shortcut or by simply executing the uninstaller.jar file under the <Path to the QPCR installation>/Uninstaller directory.

```
Linux/Unix   : java -jar Uninstaller/uninstaller.jar  
Windows      : double click on the uninstaller.jar
```

This removes all files generated during the installations.

Attention: If you force the removal of the base installation directory also all the data files are gone.