PQLX DB Administration

Introduction

This document describes the PQLX GUI program 'pqlx-admin'. 'pqlx-admin' provides all functionality related to PQLX database management, including database creation, modification, and deletion; reading of server execution log files; viewing various database statistics (by channel, by data directory), etc. Where 'pqlx' is used to view trace files and their analysis results, 'pqlx-admin' is used to display the various information related to a database itself.

Execution

'pqlx-admin' may be executed in one of two ways:

1. From a bash shell command line using the command 'pqlx-admin', usage:

   bash> pqlx-admin [--dbName=***NameOfDB***]

   specifying ***NameOfDB*** as the argument to the optional parameter --dbName will automatically connect to the named PQLX database at startup.

2. From with the 'pqlx' GUI program by clicking on the 'Admin' button found on the Main Tab side-bar of the PDF and STN System Viewers. When invoked via 'pqlx', if 'pqlx' is, itself, connected to a PQLX database, the 'pqlx-admin' tool will automatically be connected to the same database.

GUI Layout

The GUI is laid out much like 'pqlx': A side-bar containing buttons as well as selectable choices; with a notebook filling the rest of the application window, containing tabs to display the various definition, configuration and statistics data of a PQLX database.

The application will be in only one of the following display states at any given time:

- Not connected to any PQLX database
- Creating of a new PQLX database
- Connected to a PQLX database in read-only mode
- Connected to a PQLX database in edit mode

Each display mode will result in a specific combination of display items (buttons, tabs, fields, etc.) being visible and/or available for use.

When invoked without arguments, the program is initially displayed not connected to a database. From here, the user has a choice of:

1. Creating a new PQLX database by clicking on the 'NEW' button on the side-bar, or
2. Connecting to an existing PQLX database by clicking on the 'Manage' button on the side-bar.

Creating a NEW PQLX Database

When creating a new PQLX database, the user is required to define all the various aspects of a PQLX database found in the sub-notebook of the Definition tab; namely, its description, the directories holding the data files to be analyzed, the PSD Channel Configuration, and the System PDF PNG output settings.

At any time in the database creation process, clicking the 'Cancel' button at the bottom will discard all information and return the program to the non-connected state.

Database Description

As the name implies, the Description tab supplies the various values that describe the database:

Field Name	Description & Function
DB Name	The name of the PQLX database, must be unique on this database host machine
Hostname	The name or IP address of the machine to host the DB. May only be selected using the '**...**' button to the right of the entry area.
Description	A general description of the DB
Organization	The name of the organization supporting this DB
Type	PRODUCTION or SCRATCH - Used only to decide how easy or difficult the DB can be deleted
Access	PUBLIC or PRIVATE, where: • PUBLIC allows all users to see and connect to the DB, and • PRIVATE allows only the creating user to see and connect to the DB
Data Admin	The name and email address of the person responsible for the administration of the seismic data represented by this DB
Technical Admin	The name and email address of the person responsible for the administration of the technical aspects of the DB.

Use the 'Next' button (bottom right) to be taken to the next screen:

Data Directories

The Data Directories tab defines the data directories that will be analyzed as part of the execution of the PQLX server program. When adding a directory, a file/directory dialog will appear allowing the user to select which directories should be analyzed. Directories are enabled by default, but may be, at any time, disabled from being scanned using the 'Disable' button on the right side-bar. Deleting a directory is only possible in DB Creation mode, once a database has been created, a directory can only be disabled, permanently if necessary, and never deleted.

A word on PQLX Data Directory set-up: the recommendation is that response files and trace files be separated into two distinct directory structures. And that when creating a database, the directory containing the response files be specified first. This way, the first time the server executes, the response files are identified first. For large datasets, when response files are identified only after thousands of trace files have been identified, problems may (or may not) occur; this can be avoided by specifying the directory

containing response files first.

PSD Config Settings
Various PSD configuration parameters may be set once DB creation has taken place. Including, defining which channel groups (e.g., BH*) should be analyzed, the length of the PSD window (in seconds), the lower and upper dB bounds, and the maximum frequency to resolve to.

When not wanting a specific channel group to have PSD's computed, remove all corresponding records from the PSDCFG table corresponding to the channel group in question (*PSDCFG.channel*).

PNG Settings
The PNG Settings tab defines how the System PDF's output by the PQLX server program will look, these being generated as the last step of the PQLX server's execution. These PNG files may be used as external and static PDF plots to be displayed outside of the PQLX environment. For example, these PNG's can be located in a directory that is pointed to by a web page (internal or external to the organization), allowing for easy and automatic publishing of PQLX results.

The various settings and their descriptions are:

Field Name	**Description & Function**
Directory	Clicking the '**...**' button will pop up a file/directory dialog allowing the user to select the output directory where the System PDF PNG's will be written to. Leave this field blank to have the server generate no PDF PNG files.
Date Format	Specifies the date format that will appear on the System PDF's
Plot HLNM	Check button indicating if the Peterson High/Low Noise Model should be plotted on the PDF
Normal PNG	The normal PNG is the System PDF displaying all information, in a normal size
Icon PNG	The icon PNG is a smaller version of the normal PNG displaying less information, but enough to get an idea of the PDF plot. This may be used as a pop-up, for example, on a web page listing all channels.
Width/Height	Clicking the '**...**' button will pop up a sample PDF plot. By dragging the lower right corner, the user can visually determine the exact width and height of the PDF PNG output.
Border & Color	Indicates if the PDF plot should display a border. The color picker allows the user to define the color to be used.
Statistics	Via checkboxes, the user can define which statistics should be displayed on the PDF plot.
TEST	The TEST button displays a sample PDF plot using the settings provided by the user.

Password
Provide the password that will be associated with a database. This password will be needed in the future when wanting to edit any of the database configuration parameters.

Provide a hint here to remind yourself of the password when it has been forgotten. (This hint will be displayed exactly as input when requested.) Either the hint should be private (only you understand the hint to resolve the password), or, if the database should be completely open to everybody for editing, set the hint phrase to explicitly state what the password is. The hint may be blank, but this is discouraged.

Once the password has been provided and confirmed, click the 'Create DB' button to create the PQLX database.

Access to DB Edit functions not yet currently password-protected.

(Documentation continued below...)

Connecting To a PQLX Database

Use the Manage button on the side-bar to select a PQLX database to connect to. Like 'pqlx', it is possible to connect to any PQLX database on any server the program is able to make a connection to. If the database server is on another machine, i.e., is not 'localhost', provide the server name or IP address in the 'New PDF Server' entry area. Selecting and double-clicking on a PQLX Server will display all PQLX Databases being hosted on that machine.

Once connected, the database information will be displayed in read-only mode; no database configuration attributes are available for editing. However, additional information will be available in the 'Data Directories' tab, namely, for each directory, the date of the most recent file identified, the total number of trace files, and the total number of response files will be displayed.

Use the 'DISCONNECT' button to disconnect from the currently connected database, returning the program to a non-connected state.

In addition to the database Definition tabs, additional tabs 'Channels' and 'Exec/Logs' are available for viewing.

Channels Tab

The 'Channels' tab lists all 'active' channels existing in the database. An 'active' channel is defined as a channel that has at least one trace file associated with it. ('Inactive' channels can exist in the database, for example, when response files have been identified for a specific channel while no trace files exist. This is interesting since it makes it entirely possible, for example, to specify the same single response file directory for multiple PQLX databases that contains ALL response files for all PQLX databases, while at the same time the data directory(-ies) for any specific PQLX database contains trace files for only a sub-set of the channels defined by the response file directory.)

Top of the tab displays the following information:

- Search: - type in any part of a Channel Name to restrict the display list, list is automatically updated.
- Total Channels - Defines the total number of channels currently on display
- Start Date - List the Start Date and Time of the channels currently on display
- End Date - List the End Date and Time of the channels currently on display

The list of channels provides for the following statistics to be displayed:

- Start and End Dates of Identified Trace Files
- Total number of Traces
- Total number of Computed PSD's
- Total number of Sample Rate Epochs
- The full-path name of the associated response file

Double-click on a channel row to view the Sample Rate Epoch date boundaries for a given channel. In the case where multiple sample rate epochs exist for a channel, System PDF's will be created only for the most recent sample rate epoch.

re-PSD

The re-PSD button on the side bar provides the option to have one or more trace file re-analyzed for PSD computation. Select one or more channels for re-analysis, click the re-PSD button, and select/specify the date range for which the trace files will be

re-analysed.

Once all channels and date ranges have been selected, either:

- go to Exec/Logs tab to execute the server, or
- wait until next (possible) automatic execution of server

Exec/Logs Tab

The 'Exec/Logs' tab lists all executions of the PQLX server-side programs (currently only 'pqlxSrvr'). Selecting a specific execution in the upper-most data viewer will display the log output of that execution in the lower data viewer. If the server program is currently executing, the log viewer will automatically be updated as new messages are generated by the server. Use the 'LOG Display' pull-down to define if LOG messages, ERROR messages or BOTH should be displayed in the log viewer. As well, when the server is currently executing, an additional window will be provided to display the current event queue contents, allowing the user to follow a server's execution as it proceeds.

Using the 'Refresh' button the side-bar will update the list of server executions, guaranteeing that the list on display is up-to-date and current.

Executing the Server Analysis Program

Use the 'Execute' button on the side-bar to execute the server from within the 'pqlx-admin' tool. It is still, and always will be, possible to execute the server from the command line as before.

Once an execution has started, the Server Execution and Log windows will automatically update. The 'Execute' button will change to 'Pause', allowing the user to suspend the server's execution. When a pause request is made, the server must first finish processing of any active events currently executing; scanning of data directories is not pausable. Use the 'Resume' button to continue the server's execution.

During execution, an "Event Q" display will appear describing the current state of the PQLX Event Queue, all PQLX events falling into one of three categories:

Type	**Description**
Executing	Event is currently being executed
Queued	Event is queued awaiting execution
Pending	Event is sitting on the queue, but execution is pending until relevant execution phase of the program is reached.

Once execution has completed, analysis results may be viewed with the Client-Side Program 'pqlx'. Selecting the '**pqlx**' button on the side-bar will invoke the Client-Side Display Program, automatically connected to the same PQLX database 'pqlx-admin' is currently connected to.

Server Configuration

Use the 'Configure' button on the side-bar to view various server execution options, specified in the following sections:

- General Options:
  - Number of CPU's - How many CPU's should the server use to analyze the data

- Directory Scanning - Do not scan **any** data directories
- Refresh - Create events to have all System PDF's and Spectrograms re-computed and output

- Process Specific Files:
  - File Name - Specify/Select the input file containing the list of trace files that should be re-analyzed.
    N.B. When specifying this option, Directory Scanning is disabled by default.

- Time Restriced Execution:
  - Time Restriction - Allows the user to specify that the server should execute only during specific hours during the day. When 'On' is selected, additional arguments define exactly during which hours the server is allowed to execute.

    When using this argument, the server will enter into a Pause state at the point that the End Time is breached. When the Start Time once again comes around (on the clock), the server will issue a 'Resume' command and execution will again resume until End Time is again breached.

(Documentation continued below...)

Editing a PQLX Database

After having connected to an existing PQLX database, it is possible to edit its definition and configuration parameters. For example, a user can enable or disable Data Directory scanning, modify the Description definitions, modify the PNG Output Settings, or even delete the database completely.

Use the 'EDIT' button at the bottom to start edit mode, *providing the proper password to gain edit access*. Once in edit mode, modify all fields as desired. When complete, use the 'SAVE' button at screen bottom to update the database configuration parameters. All settings take immediate effect (though may not actually do anything until the server is next executed).

N.B. The Database Name and Database Host cannot be changed once a database has been created!