

Kevlar User Guide

January 29, 2005

This manual provides an overview of how to use the Kevlar system.

1 Your First PipeLine

This section will take you step by step through construction of a simple pipeline, which lists the files in your current directory.

1.1 Getting started

First you need to get programs that will perform the desired task for you. In Kevlar, there are three ways in which you can access programs (see sections corresponding to each method for more details):

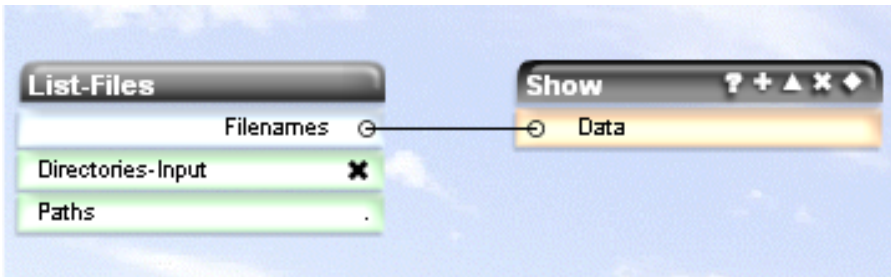
- **Using Programs pane.** You can use Programs pane to locate programs and to drag them from the pane onto the canvas.
- **Using keyboard** You can use keyboard to type the name of the program you want to use and it will appear on the canvas.
- **Using Search pane** You can use Search pane to search for programs and then use the results returned.

Let's use Programs pane to get your first program. Open Programs pane by either clicking on the arrow at the right side of the canvas or by pressing Ctrl+P. Next step is to click on "FileUtils" and to locate "List-Files" program. Now click and drag "List-Files" onto the canvas - you have your first program successfully added to the pipeline!

What you need to do now is to connect "List-Files" program to the program that will show you the outputted result. Kevlar has a build-in program called "Show" that does exactly what we want - displays the results of executing the pipeline.

If you click in the middle of the canvas and type 's'. This will bring up a list of all programs available in Kevlar that start with letter s. At this point you can either navigate down until you find "show" and press enter or you can type 'h', which will result in only "Show" being left in the list now, so you can press enter to select it. The "Show" program has now been added to the canvas.

Next step is to connect "List-Files" to "Show". To do that, simply click "FileNames" node in "List-Files" and then click on the "Data" node of the "Show". The pipeline will appear between the two programs. At this point your pipeline should look like this:



To execute a pipeline, click on the execute button on the toolbar or press Ctrl+Enter. When the arrow at the bottom of the canvas turns orange, indicating that pipeline has finished running, click on it to expand an output pane which will display pipeline's output.

1.2 Constructing more complex pipelines.

When constructing more complex pipelines, you can greatly benefit from using Help system available in Kevlar. To activate Help, simply right-click on any program, argument or IO node that you want to learn more about and the Help window will popup next to it explaining how and what it is used for.

Another feature of Kevlar that you will find very useful is that you can recognize that your pipeline has errors during the construction stage. All invalid entries in your pipeline are highlighted by being displayed in red. If such entries exist in your pipeline, you will not be able to execute your pipeline, which is also indicated to you by showing that the execute button is disabled.

2 Toolbar

This section describes what the toolbar is used for, how to use it and what the toolbar buttons are for.

2.1 Toolbar buttons overview

The toolbar is used mostly as means of quickly accessing Kevlar's task panes and to execute constructed pipelines when using the mouse.

To activate any of the toolbar buttons simply point your mouse pointer to the icon, corresponding to the action you wish to perform and left-click on it.

Figure 1 . Kevlar's toolbar



The toolbar contains the following buttons (left to right on the diagram above):

- **Clear the canvas.** If this button is pressed all the programs and pipes that are currently on the canvas will be removed without being saved. This option can be used if you want to start construction of a new pipeline and do not wish to use the programs you have placed on the canvas during the construction of the previous pipeline.
- **Load.** If this button is pressed the Load Pipelines task pane becomes visible on the right hand side of the canvas. If you had a different pane open before pressing this button it will switch to Load Pipelines view. (See Load pane section for more information).
- **Save.** If this button is pressed the task pane will switch to or open a Save Pipelines view. Like with the load button, if you had a different task pane view open it will be switched to Save Pipelines view.(See Save pane section for more information).

- **Execute.** Pressing this button will cause the pipeline you've constructed to execute. When execution is finished it will be indicated by the orange arrow at the bottom of the canvas. Pressing that arrow will expand the show pane, which will contain the result outputted by your pipeline. However, if your pipeline contain error, pressing execute button will not run your pipeline (execute button will be disabled).
- **Stop execution.** If this button is pressed during an execution of the pipeline, the execution will stop.
- **Show pane.** Pressing this button will slide the show pane in or out.
- **History.** This button switches the task pane view to the History view, which contains history of the pipelines executed in the current session. (See History pane section for more information).
- **Programs.** This button will switch the task pane view to the Program view. The Program view allows you to see the programs available in Kevlar organised in the directories according to their functionality. (See Programs pane section for more information).
- **Search.** Pressing this button will switch the task pane view to the Search view. This view can be used for the keyword search for programs available in Kevlar. (See Search pane section for more information).
- **Directory.** This button will switch the task pane view into a Directory view, which can be used to browse the directories available on your computer and also to view the content of directories. (See Directory pane section for more information).

3 Task panes overview

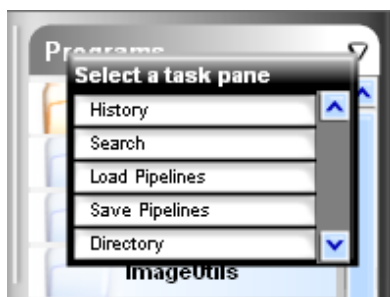
This section introduces task panes that Kevlar uses. Task panes are used to assist you in performing operations such as saving or loading the pipelines you have constructed or searching for the right program to use.

When you start Kevlar, none of the task panes are visible so you can have as much of the canvas space for pipeline construction as possible. However, if you want to use features task panes have to offer, you can open them. An opened task pane is displayed at the right side of the canvas. There are three ways in which you can open and close task panes:

- **Using expand button.** Task pane view can be opened by clicking on an arrow expand button at the right side of the canvas. The task pane slides out showing the Programs pane.
- **Using keyboard shortcuts.** Each task pane view has a keyboard shortcut that can be used to access it. Using those shortcuts will open the task pane in the view the shortcut is associated with. (See Keyboard Shortcuts section for more information.)
- **Using toolbar.** The toolbar can also be used to access task panes by clicking on the icon corresponding to the task pane view you want to open. More on this in Toolbar overview section.

If you want to hide the task pane, just click the expand button or press the same keyboard shortcut again.

Once you have task pane view open, you might want to switch between panes. This can be done just by using toolbar buttons or keyboard shortcuts. However, you can also switch between task panes by clicking on the arrow button at the top right corner of your current task pane. This will bring up a drop down list of all the task panes available in Kevlar.



To switch to a different task pane, just select it from the list and click on it. The task pane will switch to the view you have selected.

3.1 Programs pane

Programs pane can be used to access Kevlar's programs, which are organized into directories depending on the program's functionality. The Programs pane shows a directory tree of Kevlar's programs.

To access a program, go into a directory containing the program you are interested in by clicking on it, select the program you wanted to get, click on it and drag it onto the canvas. The program will appear on the canvas, showing its arguments and IO nodes ready for you to use.

4 Search Pane

Search pane is a very useful tool in finding which program to use in your pipeline if you don't know its name but know what functionality you want the program to achieve.

4.1 Using Search pane

Once you opened a Search pane you can start using it. All you have to do is to type in the keywords you want to search for and press search button (or return). If the search words you've entered don't match any of the programs' keywords the search results will be empty. For example, if you try searching for "hello", the search will return nothing and your Search pane will look like this:

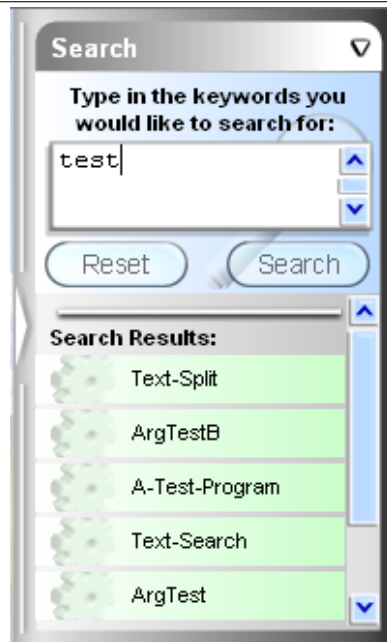
Figure 2 . Search pane when nothing have matched the keywords entered.



However, if the search has found some matching program entries for the keywords you have entered, the list of results will be displayed on the Search pane. For instance, if you search for "test", the search will return a list of programs that match your keyword and the Search pane will look something like:

If the search has been successful and a list of programs is returned, you can use those programs by simply dragging them onto the canvas. However, if you are still not sure which program to use you might want to

Figure 3 . Search pane when a list of entries matching entered keyword has been returned.



use Kevlar’s help system. Just right click on the program you wish to find out more about and the help will appear describing the program selected.

5 Directory Pane

This section describes why Kevlar has Directory pane and how to use it.

5.1 Motivation behind the Directory pane

Directory pane can be used to navigate and browse the directories available on your computer. It is also a quick way to perform operations of changing the directory and listing its contents, which are very often performed in a shell.

5.2 Using the Directory pane

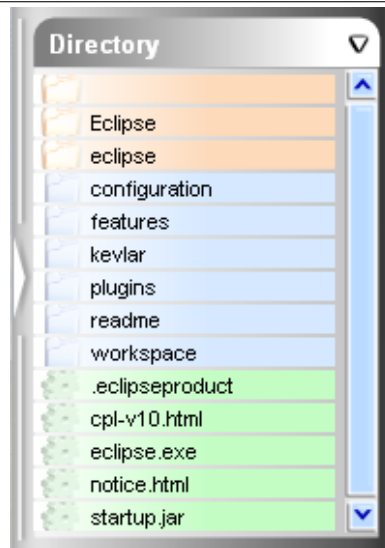
First of all, open the Directory pane view if you don’t have it already open. Your Kevlar should look something like that:

All entries in the Directory pane are colour coded to make it easier for you to navigate through your directory tree. Orange entries represent parent directories, blue entries represent sub-directories and green entries - files within the directory you are currently in.

To navigate through directories, simply click on the directory you want to go to. The Directory pane will refresh showing you the contents of the directory you clicked on and also all the parents of that directory.

A word of warning: navigating through directories using Directory pane changes your current working directory, which may affect execution of your pipelines and therefore the results returned!

Figure 4 . A screen shot of a directory pane.



6 Save Pane

Save pane is used to save constructed pipelines onto disk.

To save a pipeline to disk you need to perform the following operations. First of all open task pane in save pipelines view. Next enter the name of the file you want to save your pipeline in into the textbox. Now, select a directory you want your file to be save into from a directory tree and click "Save".

If saving of your pipeline was successful, the saving pane will close. However, if a problem was encountered with your save operation, the save pane will stay open and the reason for saving failure will be displayed at the top of the panel.

7 Load Pane

Load pane is used to load previously saved pipelines onto the canvas.

To load a pipeline from disk you have to open a task pane in load pipeline view, navigate to the directory that contains the file you want to load. Those files are represented as thumbnails of pipelines that are saved within them. In order to load a pipeline, all you have to do is to click on the thumbnail showing the pipeline you want to load.

The loaded pipeline will appear on the canvas. Loaded pipeline can be manipulated in the same way as any other pipeline.

8 History Pane

History pane is used to keep a list of pipelines executed in the current session. Every time you press execute button or a key shortcut to execute a pipeline, it is added to the History pane. The motivation behind History pane is that you can store and load pipelines that you have constructed in this session to/from the pane without saving them to disk.

8.1 Using the History pane

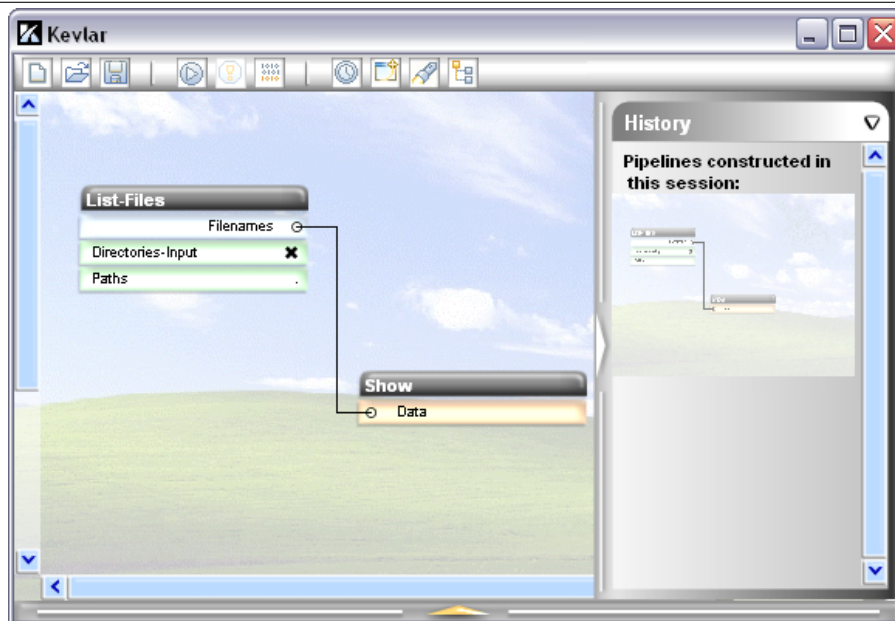
If you have just started Kevlar and haven't executed any pipelines yet and opened History pane it will be empty and you will see something like this:

Figure 5 . History pane when no pipelines have been executed yet



If we now execute a pipeline, lets say List-Files, the History pane will contain a thumbnail of the pipeline just executed:

Figure 6 . History pane after executing one pipeline



The more pipelines you execute, the more thumbnails the history pane will show. To use previously executed

pipelines, just click on the thumbnail of the pipeline you want to use and it will appear on the canvas ready for you to use again.

9 Keyboard Shortcuts

All of Kevlar's functionality can be accessed through the use of keyboard shortcuts. This section aims to explain how shortcuts can be used to construct and execute pipelines as well as access features provided by the task pane and show pane.

9.1 General Shortcuts

The following shortcut keys can be used at all points in the program.

Key combination	Action
Ctrl+Enter	Executes the current pipeline
Ctrl+T	Terminates execution of the current pipeline
Ctrl+N	Starts a new pipeline (clears existing programs and pipes)
Ctrl+A	Selects all programs
Ctrl+O	Shows/hides the output pane

9.2 Pipeline Construction Shortcuts

Note: To construct a pipeline using the keyboard, you must first make sure that no task panes currently have keyboard focus by pressing the **Escape** key.

- **Add a program to the pipeline.** If you don't know the name of the program you want to add, you may wish to search for it using the search pane (see Section 9.5). Otherwise, bring up the program auto-complete box by typing the first few letters of the program's name. A list of available programs beginning with those letters should appear. You can narrow down the list by typing more letters, expand the list by deleting some letters (pressing **Backspace**), or highlight the program you want by using the **Up** or **Down** cursor keys. When the correct program is highlighted, you can add it by pressing **Enter**. The pipeline view should scroll to where the program is placed, and the program should be *selected*. If you want to add multiple programs in one go, you can use **Spacebar** to select a program, which will add it without selecting it (so that you can start adding another program straight away).
- **Edit an argument of a program.** When a program is *selected*, you can edit its arguments by typing the first few letters of the name of the argument you want to alter. This should bring up the program entry auto-complete box, which will contain a list of the program's arguments and nodes that begin with those letters. Use the **Up** and **Down** cursor keys to select the argument you want to edit, and press either **Enter** or **Spacebar**.

If you're editing a *boolean* value, then selecting the argument will automatically invert the value and return you to the selected program.

If you're editing a *set* value, then a drop-down box will appear allowing you to change the value. Use the **Up** and **Down** cursor keys to choose the value you want, then press **Enter** or **Escape** to apply the changes and go back to the selected program.

If you're editing a *single-line text* value, then a text box will appear allowing you to edit the value. You can use all the standard editing keys to edit the text in the text box, then press either **Enter** or **Escape** to apply the changes and go back to the selected program.

If you're editing a *multi-line text* value, then a multi-line text box will appear, allowing you to edit the value. You can use all the standard editing keys to edit the text in the text box, however pressing **Enter** will insert a newline into the text rather than applying the changes. To apply the changes and go back to the selected program, press the **Escape** key.

- **Select a node of a program.** With the program selected, start typing the first few letters of the name of the node you wish to select. The program entry autocomplete box should appear listing all of the program's arguments and nodes that begin with those letters. Choose the node that you want to select and press **Space** to select the node and return to the selected program. Alternatively, pressing **Enter** will select the node and deselect the current program. If an input-output node pair is selected, a pipe will be connected between them and both nodes will be deselected.
- **Remove a pipe.** To remove a pipe, follow the steps for selecting a node of a program to select one of the pipe's end nodes. When the node is selected, press **Delete** or **Backspace** to remove the pipe.
- **Other program commands.** There are a number of other keyboard shortcuts that can only be used when a program is selected:

Key combination	Action
Up/Down/Left/Right	Move the selected program up/down/left/right
Delete/Backspace	Removes the selected program
Ctrl+E	Expands/contracts the selected program
Ctrl+H	Brings up help on the selected program
Escape	Deselects the current program

9.3 Navigating through a Pipeline

While constructing a pipeline, you may want to select existing programs quickly. Kevlar provides two ways of doing this using the keyboard.

- **Tab Traversal.** Pressing the **Tab** key while a program is selected will deselect it and select the next program right of it on the same row. If the currently selected program is the right-most on that row, the next selected will be the left-most program on the row below. Once all programs have been traversed, the top-left most program will be selected.
- **Find-As-You-Type.** Pressing **Ctrl+F** will bring up the find-as-you-type box, which is used to narrow down the programs that you tab between using tab traversal. Start by typing the first letters of the program you want to select. As you type, all programs that do not start with those letters will become *disabled*. If you now press the **Tab** key, you will only select between *enabled* programs, allowing you to select the program you want more quickly. When you've selected the program you want, press **Escape** to close the find-as-you-type box and re-enable all the programs.

9.4 Multi-Select Shortcuts

This section explains how to use keyboard shortcuts to select and manipulate groups of programs within a pipeline.

- **Select multiple programs.** To create a multi-selection of programs, start by selecting the first program you wish to add to the multi-select (see Section 9.3), then press the **Spacebar** key to create a multi-select around that program. Now use the same pipeline navigation methods to select the next program to be added, and press **Spacebar** to add it to the multi-select. Keep repeating this process until you've added all the programs you want to the multi-select.
- **Multi-Select commands.** When a program multi-select exists, certain commands that previously only applied to the currently selected program now apply to all programs in the multi-select:

Key combination	Action
Up/Down/Left/Right	Move the all selected programs up/down/left/right
Delete/Backspace	Removes all selected programs
Ctrl+E	Expands/contracts all selected programs
Escape	Deselects the multi-select

9.5 Task Pane Shortcuts

Keyboard shortcuts also exist for opening and using the functionality of each of the task panes.

- **Opening/Closing a Task Pane.** There are shortcut keys to quickly open any task pane. If you press the shortcut key for a task pane that is already open and has focus, the task pane will contract to the side of the screen.

Key combination	Action
Ctrl+P	Shows/hides the program pane
Ctrl+L	Shows/hides the load pane
Ctrl+S	Shows/hides the save pane
Alt+S	Shows/hides the search pane
Ctrl+H	Shows/hides the history pane

- **Navigating directory/category structures.** On the Program, Load, Save and Directory panes, you can navigate through the directory or category structure by pressing the **Up** and **Down** cursor keys to select a directory or category, and then pressing **Enter** or **Space** to go into that directory or category.
- **Selecting Programs and Pipelines.** On the Program, Load, Save, Search and History panes, once a program or pipeline has been highlighted using the **Up** and **Down** cursor keys, it can be added or loaded by pressing **Space** or **Enter**. If you're adding a program, pressing **Space** will add it but will not select it, whereas pressing **Enter** will add it, select it and contract the task pane.
- **Selecting Task Pane Sections.** On the Save and Search panes, which contain sections for both typing and navigating, you can switch between the two sections by pressing the **Tab** key.