

**Dia**

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## Dia

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# Chapter 1. Introduction

## Introduction

Dia is an application for creating technical diagrams. Its interface and features are loosely patterned after the Windows program Visio. Features of Dia include multiple-page printing, export to many formats (EPS, SVG, CGM and PNG), and the ability to use custom shapes created by the user as simple XML descriptions. Dia is useful for drawing UML diagrams, network maps, and flowcharts.

This document describes version 0.94 of Dia.

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# Chapter 1. Quickstart

## What Can You Do?

Dia is a diagraming application made for many people. Dia is easy enough to learn without much hassle and flexible enough to make the power users feel right at home with their commercial tools. Below is an example of what five minutes of using Dia can provide.

**Figure 1.1. Demo**

## Starting Dia

You can start Dia by going into the Applications section on the Main Menu and clicking on the Dia icon. Or, you can type **dia** in a xterm window.

## Quickstart Introduction

The Dia Quickstart for the user who doesn't want to read a whole manual to make a basic diagram.

## Creating a Canvas

All diagrams are drawn in their own *canvas*. To create a new canvas, select File->New Diagram A new canvas window will appear.

## Making a Diagram

A diagram is made up of objects. Objects are shapes that can be different colors, shapes, and sizes. They include everything from 2-bit images to full color pictures to text.

To add object to the canvas, click on an object in the toolbox and click on the canvas. The selected object will appear. The object can be manipulated mainly by clicking and dragging on the green corner buttons.

In the toolbox, you can double-click on any object to view its advanced properties. This allows you to customize the stock shape more to your liking.

Layers create multiple-images so they are one image. By doing this, a user can edit one layer without worrying about affecting any of the other layers.

Transparency allows objects to have transparent parts of an object, so anything behind the transparent section shows through.

Plug-ins allow the average user to easily add new object types to Dia, to help extend its functionality.

## Saving and Printing Your Diagram

Saving your diagram and printing your diagram is as easy as creating and modifying your document.

Dia supports saving and printing to printers. If you have gnome-print installed, the printing is very easy!

The print command can be found in the File menu when right-clicking on the canvas.

Dia supports exporting to numerous formats for excellent web publishing. Some of them include:

- Computer Graphics Metafile (.cgm)
- Encapsulated Postscript (.eps)
- Native Dia Format (.dia)
- Portable Network Graphics (.png)
- Scalable Vector Graphics (.svg)

## Who Does Dia Appeal To?

Dia can appeal to many people in a variety of industries.

- An electrical engineer may use Dia to create a diagram to show how their circuit works.
- A computer programmer may use a flow chart to show the execution path of their program.
- A network administrator is able to create a diagram to show how their company network is laid out.

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# Chapter 2. The Canvas

## Canvas Introduction

The canvas is the main part of Dia. The Dia canvas is the window where all the user's objects will be placed on the screen and arranged. When the diagram is printed or saved, the contents of the canvas will be saved.

## Gridlines

Gridlines are similar to the lines on graph paper. They allow the user to easily align objects on the canvas. The gridlines can be hidden by going into File -> Preferences . In the Grid Lines tab, the user should click on the Visible button so it says No.

## Rulers

Rulers appear on the top and the left of the Dia canvas. They show, in centimeters, how large your canvas is.

On each ruler exists an arrow. The arrow moves on the ruler in coordination with where the mouse pointer is. For example, if the user moves the mouse up, the vertical ruler's arrow will move up, indicating the change. These arrows become useful when an object needs to line up exactly at a certain measurement point.

Rulers, unlike gridlines, cannot be removed.

## Background Color

The background color option allows you to change what the background looks like in the canvas. By default, the color is white. However, the color can be changed by going into View + Diagram Properties -> Background and clicking on the bar. The bar displays what your background color is. The gridlines will change their color automatically to stay visible if the background color is changed to black.

## Zooming

Zooming allows the user to get up closer to their diagram. This helps to let the user make precision drawings.

The canvas can be zoomed up to 400%. Zoom can be done by clicking on the magnifying glass on the toolbox and clicking on the canvas. To zoom out, hold the shift button and click again on the canvas.

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# Chapter 3. Objects

## Objects Introduction

Objects are what makes up a diagram. Objects are shapes which are either pre-defined or user-defined.

## Using Objects

### Adding Objects

Adding objects to the Dia canvas can be accomplished by clicking on the desired object in the toolbox to select what you want placed on the canvas. Clicking on the canvas will then place the object on the canvas.

Dia provides two types of objects:

- User-defined objects allow a user to create their own objects, which are based off of a prefabricated template.

For example, clicking on the square object and placing it on the canvas, creates a square. However, the dimensions of the object can be changed. See the Resizing Objects section for more information.

- Pre-defined objects are mostly designs which cannot be edited. They can be resized, but the object itself cannot be edited.

### Moving Objects

When an object is inserted into the canvas, the desired object will appear with small green boxes defining the borders.

#### Figure 3.1. Adjuster Dots

The area inside the boxes is the object area. Click and hold on the object area. Then move the mouse around, inside the canvas, to move the object to another place on the canvas.

### Resizing Objects

The previous paragraph, explains the concept of the green boxes. These are used to manipulate the size of the object. To change the size, click and hold on a green button. Drag to the respective size, then let go.

The corner green buttons will change both height and width at the same time. The two on the top and bottom edges, in the center will edit height while the two on the left and right edges, in the center will edit width.

#### Tip

To drag with the corner buttons, but keep proportions, hold the shift key while resizing. This only applies to the special objects, not regular shapes.

## Deleting Objects

To delete an object, click on the object to select it. The green boxes will appear. Hit Ctrl+D and the object will disappear.

## Line Properties

One of Dia's objects is the line. The line object is symbolized by the following icon:

**Figure 3.2. The line icon**

## Line Styles

Lines can be easily edited to easily create items such as arrows. At the bottom of the toolbox is 3 buttons with lines through them. Clicking and holding will open up a menu which demonstrates what the change will look like.

**Figure 3.3. Line properties**

Lines can employ different style types such as:

- Solid
- Dashed
- Dash-Dot
- Dash-Dot-Dot
- Dotted

## Line Thickness

The thickness of lines can be edited by clicking on the five thicknesses to the right of the color selector.

## Arrows

The line tool can be used to create arrows. By clicking on the two side buttons on the bottom of the toolbox, a menu pulls out showing the possible beginning and end designs for the arrows.

## Line Colors

The line color can be edited by double-clicking on the line once it has been placed on the canvas. A window will show up. The second line is labeled as "Line Colour" with a bar demonstrating the selected color. By clicking on the bar, you can change the color of the line.

## Object Properties

Each object has its own properties assigned to it. They can be accessed by double-clicking on an object already on the canvas. A window will appear allowing you to edit numerous properties including:

- Line width
- Line color

among others.

## Colors

All the objects can be colored in different ways, according to a user defined setting.

The color control is located near the bottom of the toolbox. There are two squares make up the control. The one on the top left is the foreground color. The one in the bottom right is the background color. To edit the colors, click on the desired box and select the color in the color window that appears.

### Note

This control will only allow the selection of colors of objects which have not yet been placed on the canvas.

### Tip

To inverse the colors, click on the little arrow to the top right of the two boxes.

### Tip

To set the colors back to the default, click on the black and white box to the bottom left of the color selector.

---

# Chapter 4. Basic Objects

## Basic Objects Introduction

The first, and most common type of object is the basic object. Basic objects normally are geometric shapes, which can be customized. Dia offers the user numerous basic objects.

### Text

Dia supports the use of text as its own type of object. Text can be placed on the canvas by clicking on the text button on the toolbox.

#### Note

Text in Dia can use any font available to Gnome.

### Box

The boxes in Dia can be customized to be any size desired by the user. The properties available are:

- Corner Rounding - Causes the corners to be rounded instead of hard edges.
- Draw Background - Keeps the center clear or fills with the background color.

### Ellipse

An ellipse is a shape which has all rounded sides, such as a circle or an oval.

### Polygon

A polygon is any closed shape made up of straight lines. The polygon tool, allows the user to draw any shape with all straight lines.

### Beziergon

A beziergon is similar to the polygon as the user defines the shape. However, it differs in that it allows curves to exist in the shape.

### Line

A line simply...a line. Refer to the customizing a line section to find more information about a line.

### Arc

An arc is a line which has been bent to create a semi-circle shape.

### Zigzag Line

A zigzag line is a line which has sharp, 90 degree turns in it. They hold visual similarities to staircases.

## Poly Line

A poly-line is like a zigzagline, but does not necessarily have to have 90 degree turns to it. The angles can be customized.

## Bezier Line

A bezier line is a line which has curves in it. The bezier line tool is edited by clicking and dragging the green and orange dots. The green dots customize the size while the orange dots customize the angles at which the line curves at.

## Images

The Dia canvas can have pictures inside of it, as well as shapes.

To add an image, click on the image button and then add it to the canvas. An object that says "Broken Image" will appear. Double-click to open the properties. Click on "Browse" and select your file. Click "OK" and then the image will be updated accordingly.

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# Chapter 5. Special Objects

## Special Objects Introduction

The previous discussion explained what a basic object is. The next section goes a step further and teaches how to create objects, how to use pre-made objects which are more detailed than just shapes, and much more!

## Special Object Categories

Special objects are broken into different categories. This way, someone creating a diagram of a circuit board can see only the objects which apply to them. Dia supports numerous pre-defined categories.

|                    |   |
|--------------------|---|
| Circuit            | A group for people interested in creating diagrams of electrical circuits.  |
| Ladder             | This one is beyond my knowledge   |
| ER                 | Editor for Entity Relations Diagrams  |
| FS                 | Editor for Function Structure Diagrams  |
| Flowchart          | A group dedicated to providing the user shapes which are commonly used in flow charts. Flow charts can be routinely found in computer programming, marketing, economics, and any other semi-linear operation which requires planning. |
| GRAFCET            | A chart which diagrams the step, the action, the transition, and the condition associated to the transition.  |
| SADT               | Good question!  |
| UML                | Refer above   |
| Chronogram         | Uses objects to be used in a chronographic design. These are common place in time lines.  |
| Network            | Used by network administrators to create a design of their network.   |
| Sybase             | Designs diagrams display the flow of a Sybase computer network.   |
| Electric           | Shows flow of electricity, I guess  |
| Pnumatic/Hydraulic | Allows diagraming of a device which employes hydraulics.  |

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# Chapter 6. Selecting Objects

## Selection Introduction

Selecting objects is probably the most frequently task when using Dia. From the moment you create a new object to the moment you think the diagram looks the way it should be, you will always have to select objects to set them up properly.

When you select objects, you bring focus to an object to edit. An object which is not selected, cannot be edited.

Selecting objects can be done in many different ways, and there are also many operations can be performed on these selected objects.

You can select objects to simply drag them around the diagram, or to group them in a logical way to manipulate them more easily, to connect them each others, or to simply remove them from the diagram.

## How To Select Objects

### Basic Selection

The basic way to select an object is by clicking on it.

When the object is selected it appears on the diagram with some little green points on its corners and on its sides.

Once the green points appeared, you can start manipulate this object as you wish. When you're done with it you can deselect this object by clicking on any free space of the diagram, the green points will disappear and selection of an other object becomes possible.

### Multiple Selection

The simplest way to select more than one object at the time, is by clicking on a free space of the diagram with the left mouse button and moving the mouse while pressing on it. Doing so will draw a thin rectangle on the Canvas. All objects present in this area will be selected when depressing the button.

An other way to do so is by holding down the Shift key while selecting the objects by clicking them one by one.

Once your selection is complete, each of the selected objects must appear with its own green points as described above.

Multiple selection is useful when you want apply the same operation on many different objects and you don't want waste time by selecting them one by one.

When selected, objects act like a group. Meaning if you try to drag one of them, it is the whole group which moves. The same if you try to delete one of them, it is the whole group will be removed from the diagram.

Then if you click on any free space on the diagram or if you change to another layer, you will loose the selection. Or if you want to add some more objects to your selection, simply hold down the Shift key again and click on the items you want add.

## Note

Assuming you selected some objects on your diagram, it is still possible to resize one of them without changing the size or position of other selected objects. To learn how to resize objects see the Resizing Objects section.

## Other Ways for Selecting Objects

Other ways for selecting objects are describe below, all these options can be reached in the Main Popup Menu under the Select menu :

Selecting all objects

Choosing the All option will let you select all the objects present on the current layer, the same way as you could do it by hand.

This option is a shortcut of when your diagram contains a lot of objects and you don't want waste your time in selecting objects one by one.

Deselecting all objects

Selecting the None option will deselect objects you have selected before. It has the same effect as when you clicking on any free part of your diagram.

After you have deselected objects you cannot perform any operation on them anymore. So you have to select them again to continue

## Tip

Often you will have to keep your selections persistent, to do so, you can form an arbitrary group with the selected items or cut and paste them in a new layer which will contain all the objects of your selection.

Inverting the selection

Admiting you have ten items on your diagram and want to select only eight of them. One way to select these eight objects can be done by the Invert option under the Select menu.

Simply select by hand the two objects you don't need, then check the Invert option and you will get the eight objects you wanted being selected and the two others left on their owns.

## Tip

Another way to do this is to select All the items as described above, and then press the Shift key and deselect the objects you don't need.

## Note

Only objects present in the current layer can be selected. If an object doesn't want to be select it's probably because it is situated in another layer. To know how to change the current layer or how to manipulate many layers, please refer to the Managing Layers section.

## Selecting Connected Objects

One really useful and powerful feature of Dia is its ability of handling connection between objects.

Connections, in Dia, can be used for many purposes. The first, and not the least, is to explicitly specify a direct relationship between two objects.

The second could be it is easier to manage objects that behave efficiently in following established rules and can be accessed in a few clicks.

Selecting objects connected to a particular object, is as simple than selecting this particular object, right click on the Canvas to get the Main Popup Menu appear and click on the Select->Connected button.

If this object doesn't have any object connected to it, it will do nothing. Otherwise, all the connected objects will be magically selected and will form a new group of temporary selected objects.

### **Note**

If you repeat this manipulation again, that will be all the connected objects to this new group that will be add to the selection.

You can redo the operation until you have selected all objects that were connected all together.

## **Selecting Transitive Objects**

Technic shown above is fine when you only want select a small number of connected objects at the time.

Sometimes you will have to select a whole bunch of objects which are connected all together. This way of selecting objects step by step isn't efficient.

This is the reason why Dia offers you to do all these steps at once.

To do so, select the root object you desire, then right click on the Canvas to have the Main Popup Menu appear on screen, but this time choose the Select->Transitive button instead of Connected.

And that's it, all objects that were connected to the root object you choose are now selected and ready to be manipulate and waiting for you to apply on them any number of operations you would like.

## **Selecting Same Type of Objects**

Dia implements some trick to select objects issued from the same type.

Meaning if, for any reason, you need to select objects matching the same type (all Rectangles, Lines or any custom Shape) you could do it by selecting an object of the type you need to select and click, in the Main Popup Menu, the Select->Same Type button.

This will automaticaly select all objects which correspond to the type you have chosen. Only objects present in the current layer will be selected.

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# Chapter 7. Loading and Saving Diagrams

## Loading and Saving Introduction

Dia follows the saving model common to most desktop applications: you must explicitly save any canvases that you wish to retain for future use. To save a file, choose File->Save from the Main Popup Menu. The result is a standard save dialog. Your canvas is saved in Dia XML format. No file extension is automatically added, so it is a good idea to explicitly add '.dia' to the name you enter.

To load a canvas from a file previously saved by Dia or created by another application, select File->Open... from the Main Menu Bar. The result is an open dialog; select the file you want and choose Open. The open dialog is standard apart from the popup menu labeled Determine file type. Choose the format of the file to open (Dia XML or Drawing Interchange) if Dia does not correctly determine the file format unassisted.

An alternate file-loading method is to start Dia from the command line with the name of the file to open given as an argument.

## File Types

A few words on file types are in order. You should be aware that not all format of files can be re-loaded into Dia after saving and that most supported file formats lose information to some degree.

## Native Dia Diagram Files

The only format guaranteed to be lossless is Dia XML. Happily, you are unlikely to accidentally save in a lossy format because File->Save always produces a file in Dia XML format.

Files in Dia XML format are automatically compressed using `gzip` to save disk space. This is almost necessary since, without compression, even simple diagrams are very large because they store much redundant information. Because Dia XML files are already compressed, you should not try to compress them manually—it will not help.

## Import Formats

Dia is able to import the following file types:

- SVG
- DXF
- XFig

## Exporting: Support for Other Formats

Dia supports exporting to many other types of file, such as:

- Computer Graphics Metafile

- Dia shape file
- DXF
- HPGL
- EPS
- PNG
- SVG
- TeX Metapost macros
- TeX PSTricks macros
- WPG
- XFig
- XSLT

Dia cannot load files in most of these formats. These formats are useful for diagrams that you need to use in another application or to distribute to users of another operating system that Dia does not support.

To create a file in one of these formats, select File->Export... from the Main Popup Menu. Choose a name and the desired format in the resulting dialog, which works like a save dialog. An appropriate file extension is automatically added.

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# Chapter 8. Customization

## Customization

Dia can be changed in a few ways, allowing the user to make Dia fit more to their needs.

To change the behavior settings, select File->Preferences... from the Main Menu Bar. This opens the Preferences dialog, shown in

The configurable properties in the User Interface tab are:

- Reset tools after create — If this button is checked...
- Number of undo levels customizes how many steps that the undo tool remembers. Higher numbers let the user go back more steps to fix an error, but take up more memory.
- Width controls the width, in pixels, of a new diagram.
- Height controls the height, in pixels, of a new diagram.
- Magnify sets a multiplier that controls what the default zoom level on a new diagram is.
- Snap To allows makes objects attract to a grid created by the program. This makes it easier for the user to align objects, as separate objects snap to the same line.
- X Size lets the user set a multiplier which sets how far the horizontal grid lines are from eachother.
- Y Size lets the user set a multiplier which sets how far the vertical grid lines are from eachother.
- Colour sets the color that the grid lines display as.

After you have made all the changes you want, click on OK to apply the changes and close the Preferences dialog. To cancel the changes and return to previous values, click the Close button. You may preview the effect of your changes using the Apply button.

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# Chapter 9. Managing Layers

## Introduction to Layers

In Dia, *layers* are managed through the Layers Dialog and all layers related operations can be achieved from this dialog.

As a general purpose, layers aim at being a shortcut for grouping related objects within a diagram. They allow you to isolate the different parts of a diagram, in the way which you can decide to show only certain parts of it and not some others will stay hidden even when exporting or printing the diagram.

Inside a layer, any operation you would like to perform on objects are possible through the Main Popup Menu, then you can act on objects just the way you use to.

### Note

Only objects present in the current layer can be selected. If an object doesn't want to be selected, you should check if it is laying in the current layer or not.

By default, each new diagram comes with the default layer which it's called the *Background* layer. Of course you can change its name and settings to customize it to your needs as you can do with any other layer.

You can create as many layers as you want, Dia will put a new layer on top of all the layers have been already created. *Layers* can be thought as a stack of transparent papers. Meaning you will be able to change their stack order, decide whether or not to show them, draw any number of objects onto them and so on.

All this can be manage through the Layers Dialog.

## Managing Layers Basics

### Create a New Layer

Creating a new layer is possible by clicking on the New Layer button at the bottom left of the dialog. Since the Layers Dialog is not diagram specific but application specific, you will have to choose in wich diagram the new layer must go in. To do so, at the top of the Layers Dialog, select the diagram you wanted to receive the new layer and then add this new layer to the selected diagram.

The newly created layer will be placed on top of the stack and will become the current layer of the selected diagram.

Then it's possible to edit any new object of your choice, copy and paste from any other layer or diagram as you could do it in single layer diagram.

### Selecting Layers

A layer is said as being activated when it is selected in the Layers Dialog. To select a layer simply click on its name in the dialog, that will highlight it. From now, any changes you will make to the diagram will affect this layer and only this one.

### Note

You'll be able to select only one layer at the time. That way you can do anything you like in this selected layer without affecting other layers on your diagram.

## Ordering Layers

Next to the New Layer button at the bottom of the Layers Dialog, are two useful buttons which allow you to set the stack order of each layer you created.

Those two buttons are used to raise and lower layers in the hierarchy of layers. The button with the up arrow is used to raise the active layer while the other is for lower the position within the hierarchy.

Ordering layers can be useful when you want hide some parts of an object with another one.

## Deleting Layers

When a layer is not needed anymore you can delete it and all the objects it contains by clicking on the Delete Layer button. Of course this will only affect the currently selected layer.

Doing so on regular basis is the better way to keep your diagram clean and light for when you want to export it to another format than the native Dia format.

Note you should be aware of any diagram you created must at least contains one layer, only because a diagram is built of layer, so a diagram doesn't contain any layer should be considered as a corrupted diagram and won't be suitable to export nor even save in the native Dia format.

## Viewing Layers

Now that you've seen what are the basics of manipulating layers, you will more easely understand why *layers* are such a powerful tool when you are building a diagram with Dia.

Understanding what layers are for can dramatically improve the quality and the visual effect your diagrams will produce.

For instance, imagine you are building a diagram with lots of objects in it, like an Electrical or UML diagram, if you drop all of your objects in the same layer, meaning the background, after a while you will get a huge unmanageable draft you won't be able to do anything with it. It will be a pain to change anything in it, you will waste time trying to remember what object is connected to that object which seems to take all the place in the middle of the mixed up objects you already put there.

Since Dia is a *Structured Diagram Builder*, all the diagrams you will build with it will be naturally structured and broken down in many little pieces you will manage with more ease and efficiency than you could do it with a single monolythic block of objects.

### Note

By definition, a diagram should be structured, so breaking it down in several logical parts won't be as hard as it seems to be. That's where *layers* becomes of first use. They allow you to isolate each of these parts in separated slides, so it becomes a real pleasure to manipulate them in any way you like.

First, *layers* can be renamed to express the part of the diagram they represent, giving them the ability to be rapidly located among others. And most importantly, *layers* can be shown or hidden depending on what part of the diagram you would like to show.

To rename a layer, at any moment during the construction of the diagram, double-click on the name of the layer in the Layers Dialog. This will bring up the Layer Attributes pop up dialog where you'll be able

to change the name of the layer.

### **Tip**

Try to find some name which matches the purpose of the layer is a useful way to remember what it is for. Don't hesitate to create many different layers in your diagram, Dia doesn't constrain you on the number of layers you've created, so feel free to adjust your own hierarchy to your needs.

The Eye Icon on the left of the layer's name is what make layers so useful, it aims at hiding or showing the corresponding layer. Meaning if for any reason you decided to not show a particular layer, simply click on the Eye Icon and the layer and everything it contains will disappear from the Canvas.

Viewing only certain layers is really useful when you want manipulate a small part of your diagram without affecting the rest. You can also work that way if you want to print your diagram on different pages or testing different settings which can affect the layout of that part. Again, feel free to experiment with layers, if set up properly they can make your diagram looks pretty much better.

### **Note**

In Dia, *Layers* creation and manipulation are as common as drawing or selecting objects in the diagram. You must get your hands on them, because you will probably have to use them any-time you will want to create a new diagram.

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# Chapter 10. Authors

Dia was written by Alexander Larsson and is currently maintained by James Henstridge. To find more information about Dia, please visit the official web page, [www.gnome.org/projects/dia](http://www.gnome.org/projects/dia) [<http://www.gnome.org/projects/dia>]. Please send all comments, suggestions, and bug reports to the GNOME bug tracking database [<http://bugs.gnome.org>]. (Instructions for submitting bug reports can be found on-line [<http://bugs.gnome.org/Reporting.html>].) If you are using GNOME 1.1 or later, you can also use Bug Report Tool (**bug-buddy**), available in the Utilities submenu of Main Menu, for submitting bug reports.

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