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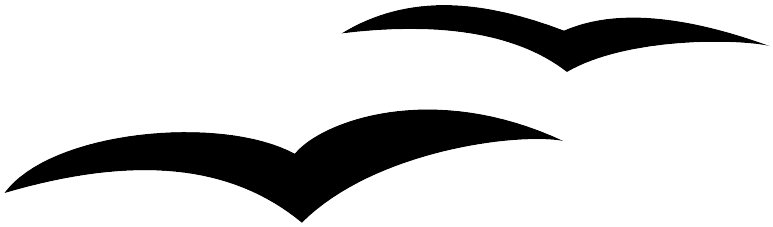
Drawing Basic Shapes:



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Overview

This chapter describes the basic methods for drawing simple shapes using OpenOffice.org Draw.

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Modifications and updates

Version	Date	Description of Change
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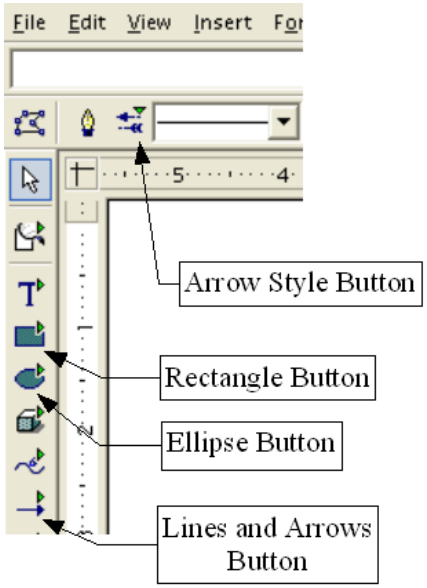
Drawing Basic Shapes

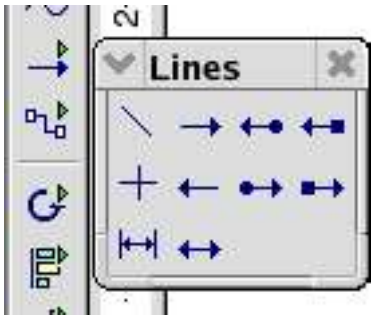
This chapter will teach you the basic methods for drawing simple shapes. In the remainder of this document, we'll use the term *objects* to designate the various shapes drawn (whether they're simple lines, rectangles or more complicated shapes). This is common notation in vector drawing software.

The following three sections illustrate how to draw three basic shapes: a straight line, a rectangle and a circle. This illustration shows the buttons on the Main Toolbar that correspond to the next three sections.

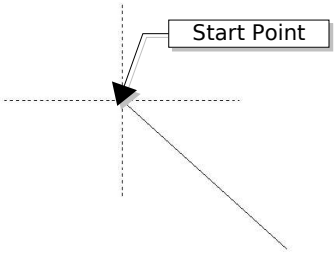


Drawing a segment of a straight line

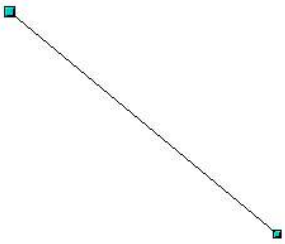
Let's get started with drawing the simplest of shapes, a segment of a straight line. To begin, click on the Lines and Arrows button on the Main Toolbar. The default line on the Main Toolbar Lines and Arrows button is an arrow. To change to a line, long-click the Arrow Style button to see a list of all the different arrow heads and tails available on line segments.



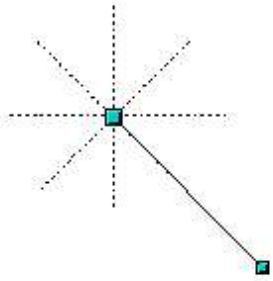
To draw a straight line segment, click the straight line button and place the mouse cursor at the point where you wish to start drawing.



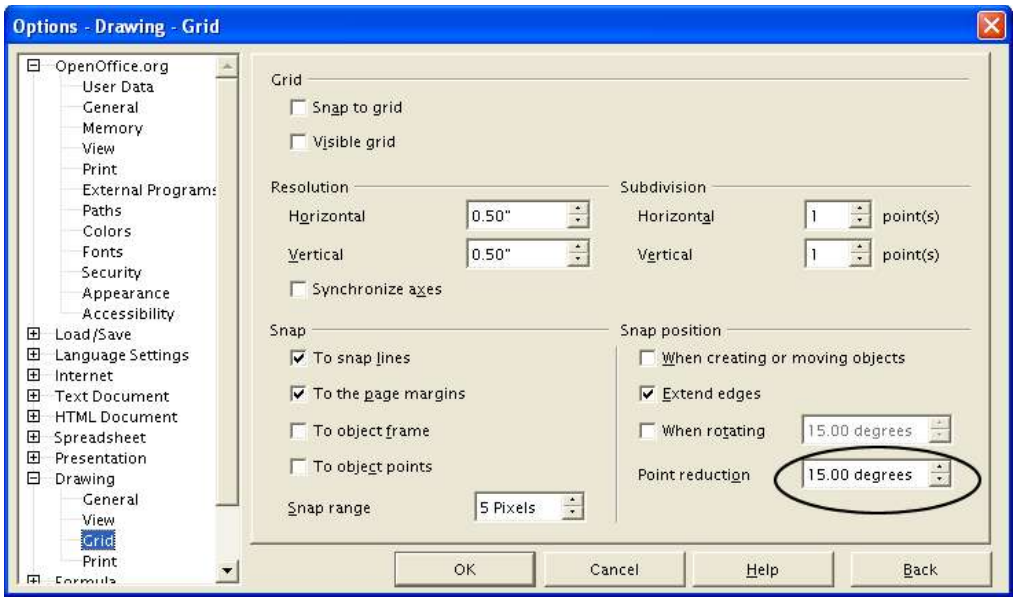
Drag the mouse while keeping the button pressed down. Let go of the mouse button when you want to stop drawing the line. Two blue or green handle points located at each end of the line will appear, showing that this is the currently selected object. The handle colors depend on the default select mode (they will be green for simple selection and blue when in point edit mode).



While drawing the segment, if you hold down the Shift key as well, you will force the line to be drawn at angle which is a multiple of 45° with respect to the horizontal. The star in dots shows the angles that are permitted for the straight line when the Shift key is pressed.

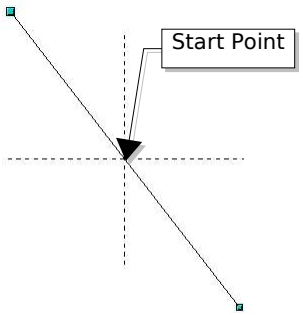


If you replace the Shift key with the Control key [Ctrl], the constraining angle will be 15°. You can set this angle in the **Tools > Options > Drawing > Grid** dialog box.



If you hold down the [Alt] key, the line will be drawn symmetrically with respect to the start point. This technique lets you draw straight lines by starting from the middle of the line.

> **Note: You must press the left mouse button BEFORE you press the [Alt] key to draw your line. Pressing the [Alt] key first will cause you to move the program panel instead of drawing a line.**

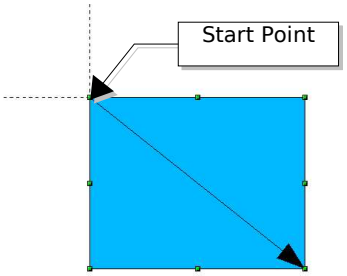


The line you draw will have the default attributes (color, line type, and arrow style). You can change the line attributes by activating (clicking) the line. Right-click and select the line, and then make your attribute changes with the menu provided. You can reach this same dialog box by clicking the line button on the object bar.

Drawing a rectangle

Drawing rectangles is similar to drawing straight line segments, except that you use the Rectangle button from the Main Toolbar.

The line drawn with the mouse shows the diagonal of the rectangle.

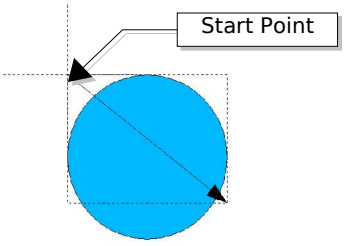


If you hold the [Shift] key, you will get a square and the [Alt] key enables you to draw a rectangle starting from its center.

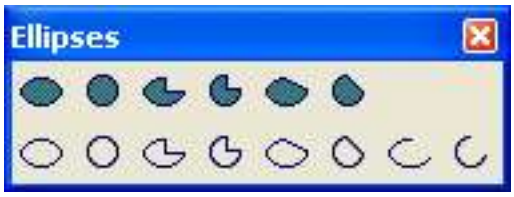
Drawing a circle

To draw an ellipse or a circle, use the Ellipse button from the Main Toolbar.

The ellipse or circle is defined by a rectangle that is linked to the diagonal drawn with the mouse. The diameter of the ellipse or circle corresponds to the longest side of the rectangle.



Extended functions shown by long-clicking the Ellipse button include circles, ellipses, ellipse and circle pies, segments, arcs, filled and non-filled closed shapes.



There are three other ways to draw an ellipse or circle:

- Shift-circle - forces the ellipse to be a circle.
- Alt-circle - draws a symmetrical ellipse or circle from the center instead of dragging corner to corner.

  Note: You must press the left mouse button BEFORE you press the [Alt] key to draw your circle. Pressing the [Alt] key first will cause you to move the program panel instead of drawing a circle.

- Ctrl-circle - snaps to grid lines.

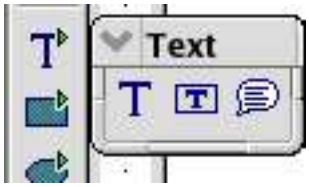
The Basic Drawing Shapes

This section provides a complete overview of the various basic objects that you can draw in the Draw module. These objects can then be edited, combined, and manipulated to create more complex shapes. In the preceding pages, we have seen how to use some of these basic drawing shapes.

All of the tool palettes described here can be displayed from the Main Toolbar.

The Texts

The text mode palette looks like this:



The Text tool lets you write text in the default font, color and size.

If you click on an empty space in the workspace, the text will be written at that spot. If you click on an object, the text will be written in the center of the object and will remain within the object, and the border of the object will become the text's frame.

When you've finished typing your text, click inside the frame. If you wish, you can drop to the following line by pressing the [Enter] key. The text can be edited at all times by clicking

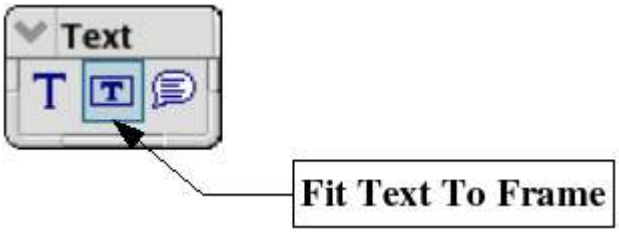
on it.

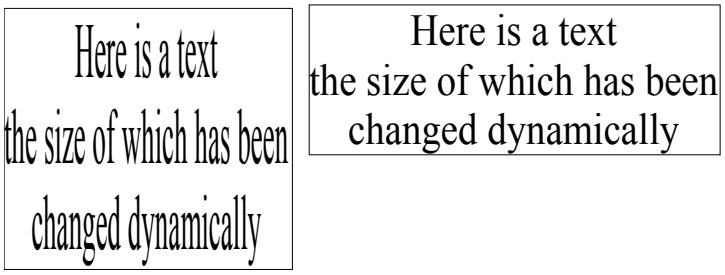
When you type your text, you will notice that the upper ruler includes the usual paragraph attributes: indents, first line, tab stops.

You can, as in Writer, change the style of all or part of the characters you enter. The Stylist also works here, so you can create styles that you can use again in other text frames exactly as you would with Writer.

The text frames can also be manipulated just like any other draw objects. You can assign them fill colors, shadows etc. You can also rotate the frame and write the text at any angle.

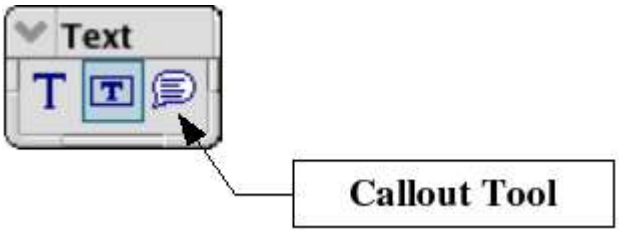
The Fit Text To Frame tool lets you type in text, but you can also change the size of the resulting text by manipulating the object's selection handles.





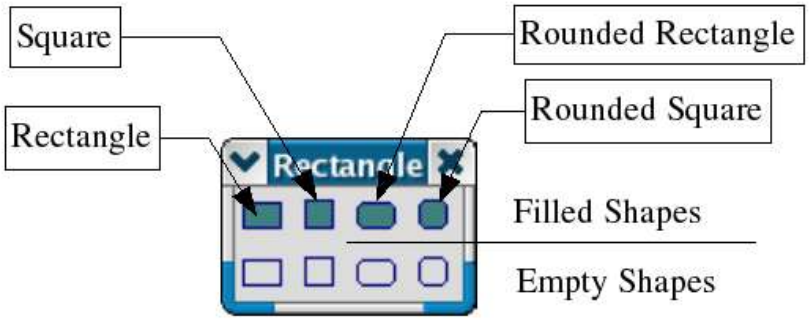
In the example above, the same text has been duplicated, but the selection rectangle has been changed. In order to make the effect clearer, we have displayed the border of the rectangle.

The Callout tool in the palette is used for creating captions (callouts or figure labels). In fact it's a tool that puts a frame around text and provides a connector (an articulated arrow). This tool has been used many times for the captions in this manual.

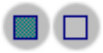


Rectangles and Squares

This toolbar palette has 8 tools:



These buttons let you draw filled or empty rectangles.



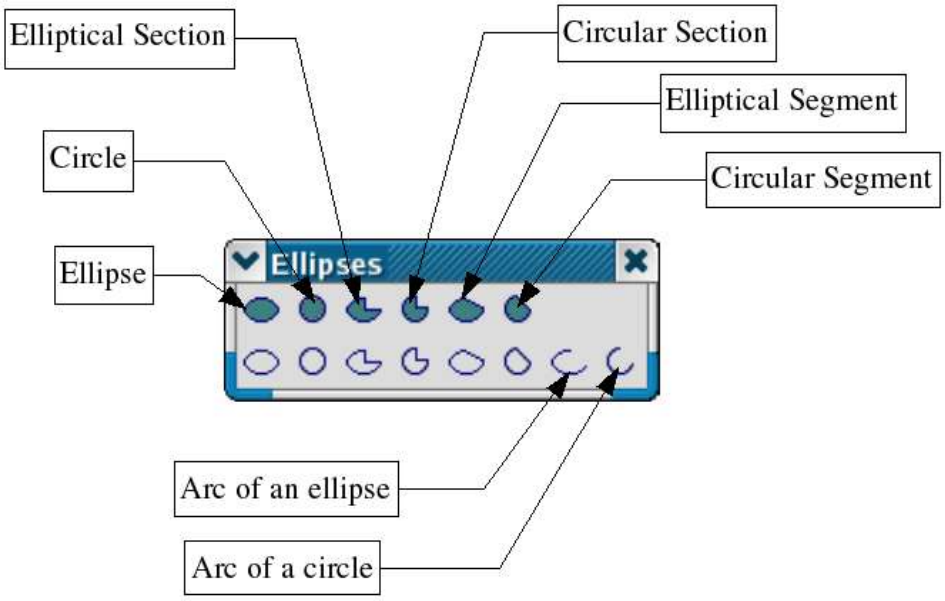
These buttons let you draw filled or empty squares.

Note: If you hold the [Shift] key down when drawing a rectangle, you will create a square.

These buttons let you draw filled or empty rounded rectangles.

These buttons let you draw filled or empty rounded squares.

Circles, Ellipses and Arcs



These two tools let you draw empty or filled ellipses.

These two buttons let you draw empty or filled circles.

Note: Drawing an ellipse while holding down the [Shift] key at the same time also lets you draw a circle.

These two buttons let you draw an elliptical sector. Here's the way to do this:

First draw the ellipse. Then indicate on the ellipse with the mouse the position of the first segment and then repeat this for the second segment. You will note the particular shape of the mouse cursor when drawing the elliptical sector.

These two tools let you draw circular sectors. The way to draw them is similar to that for elliptical sectors.

You can also draw elliptical segments. An elliptical segment is an ellipse that has been cut into two along a straight line segment. The idea is simple: first draw the ellipse, then place the first and second segment points. You will note the particular shape of the mouse cursor.

These two buttons let you draw circular segments.

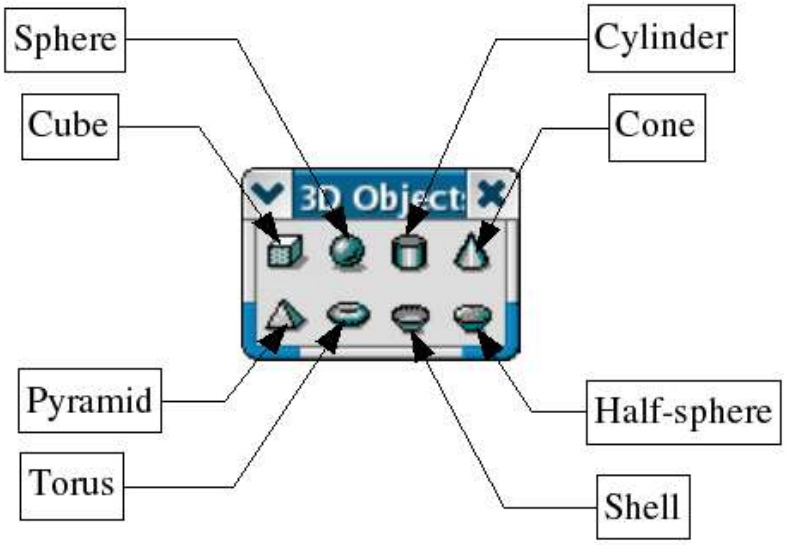
This button lets you draw an elliptical arc. This works in a similar way to elliptical sectors, except that the resulting figure isn't closed.

Here again, note the shape of the mouse cursor. Just like with sectors and segments, arcs can be changed at any time.

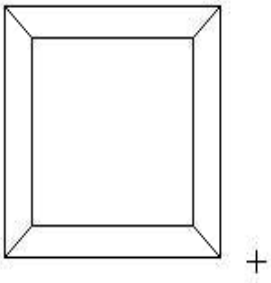
The last tool in the ellipse palette lets you draw circular arcs.

3D Objects

Draw lets you draw three dimensional objects. The 3D object palette offers a choice of 8 basic primitives that can be used to create more complex objects through merging or combination.



The creation of a 3D object always works in the same way: click on the associated button and then draw a rectangle on the work area corresponding to the foreground area of the object to be drawn. A cube silhouette (boundary box) that will contain the future object is displayed.



This tool creates a cube. More generally, this tool can be used to create 3D parallelepipeds. If you want to draw a cube, press down the Ctrl key [Ctrl] while drawing your shape.

This tool lets you draw a sphere. In reality, the object drawn by default with this tool is an ellipsoid. To obtain a sphere, just press the Ctrl key while drawing.

This tool lets you draw a cylinder.

This tool lets you draw a cone.

This tool draws a pyramid.

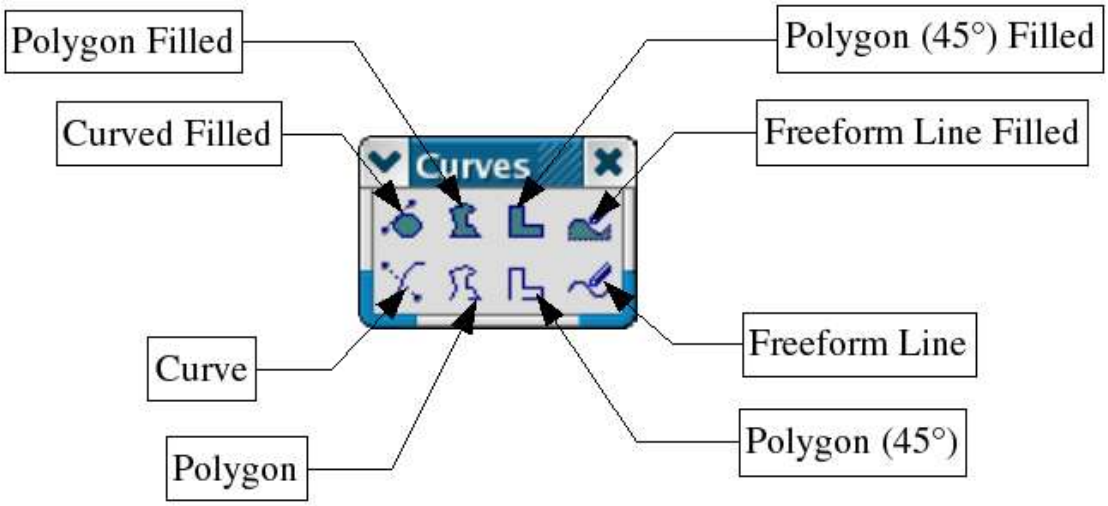
This one lets you draw a torus (a ring).

And this one a shell or cup shape; that is, a hollowed out hemisphere.

This button lets you draw a complete hemisphere; that is, filled.

Curves

The curve palette offers 8 tools for drawing non-linear profiles.



These icons represent the basic tools for drawing curves. The resulting curve can be manipulated by Bezier curves as we have seen previously. The principle behind the tools is as follows:

Click on the drawing area to position the first point. Keeping the mouse button pressed down, move the mouse to draw the tangent to the curve that passes through the start point. Let go of the mouse button and move the mouse to draw the curve.

To finish the shape, double-click on the left mouse button. This operation can be repeated immediately starting from the newly created end point.

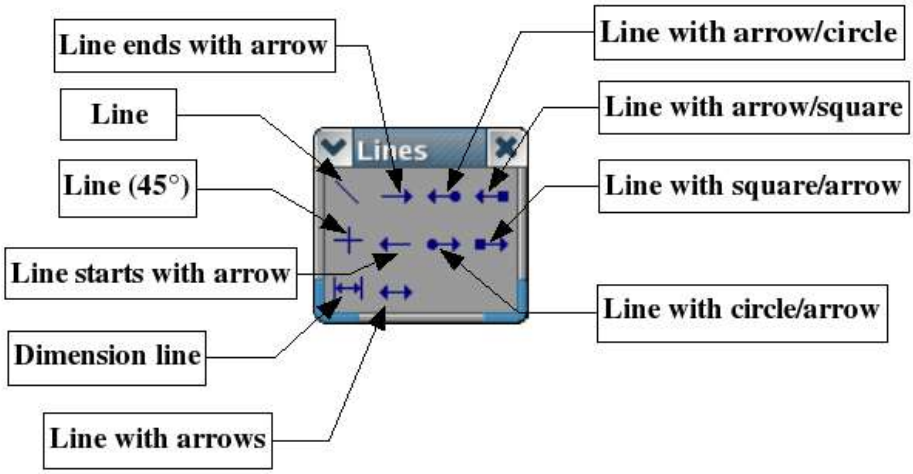
The shape you create will be filled or empty depending on the button you pressed. Where the shape is filled, a segment will be drawn from the start point to the end point. The object that results can be manipulated like any other, but you can also play with the tangents of the object in **edit points** mode.

This tool lets you create polygons. A polygon is a series of straight segments. The way it works is fairly simple: just click on the workspace to set the first point, move the mouse to the next position where you want to set a second point and click, and a segment will be drawn between the two. The polygon is drawn by repeating this procedure until all of the points have been drawn. When you have finished, double-click on the mouse to release the polygon from edit mode. If you chose to create a closed shape, a segment will link the start point to the end of the last segment that you have drawn.

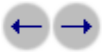
This tool is similar to the previous one, but various segments will all have angles that are a multiple of 45° in relation to a horizontal axis. The shape drawn will be open or filled depending on the button chosen.

When you click on these buttons, you can draw a freehand line. The principle behind this is as follows: move the mouse and at the same time hold down the left mouse button. The movement of the mouse as shown on screen will become the curve that is drawn. OpenOffice.org actually draws a curve composed of several control points. You can check this by switching into **edit points** mode. Here again, depending on the icon chosen, you can draw a closed or open freehand curve.

Lines and Arrows

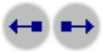


This button corresponds to the simplest of drawing shapes, a straight line segment.



The line drawn will begin or end with an arrow.

The two ends of the segment are made up of a circle at one end and an arrow at the other.



The two ends of the segment will be made up of a square at one end and an arrow at the other.

The segments drawn will have an angle that is a multiple of 45° to the horizontal axis. You can get the same effect by pressing the Ctrl key when you draw your line.

This button lets you display the dimensions of the object being drawn. A dimension object includes a double-headed arrow, two segments that indicate the extremities of the measured zone, and a measure in the current unit of measure.

If a dimensioned object is resized, the corresponding change in size is recalculated automatically and displayed. If you group an object with dimensions, any change in the size of the object will be reflected in the sizes reported in the dimensions. In such a case, we call them associated dimensions. The dimensions can be configured using a dialog box that is available from the local dimensions menu.

The dimensions are shown as default in the unit of measurement corresponding to that of the sheet. You can change the units using the menu Format > Dimensions.

The Dimensioning options dialog lets you set up the positions of the elements that make up the dimension. You can enter line thicknesses, distance and overhang to the guide marks, text position and also change the unit of measurement displayed (or even not to display the unit of measurement).

You can also set the line type and text attributes using the classical available functions already discussed.

With this tool; you can draw a segment bearing arrows at each end.

Connectors

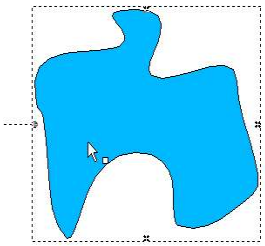
Connectors are a particular type of curve, the ends of which are attached to gluepoints on other objects, and which stick to these gluepoints when the associated object is moved. They are particularly useful for making organizational charts. You can reorganize the blocks of your chart while keeping the links between them.

OpenOffice.org Draw has a whole panoply of functions that are really quite remarkable as far as connectors are concerned. Finding the various functions is not at first sight very easy, but we shall look at the ways of making them visible.

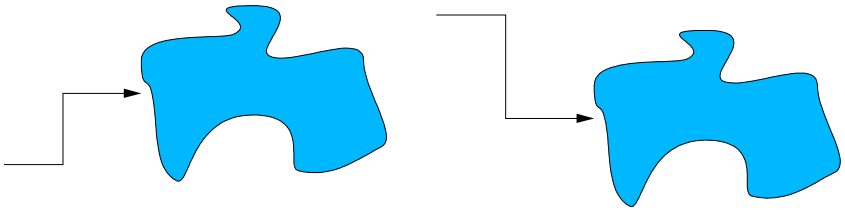
Connector drawing basics

The principle behind drawing a connector is as follows: all objects have gluepoints associated with them. The gluepoints are invisible by default. The connectors you can draw position themselves automatically onto the gluepoints of the object. Draw sets the default number of gluepoints for an object to 4. We will see later how you can change the position of the gluepoints and add new ones.

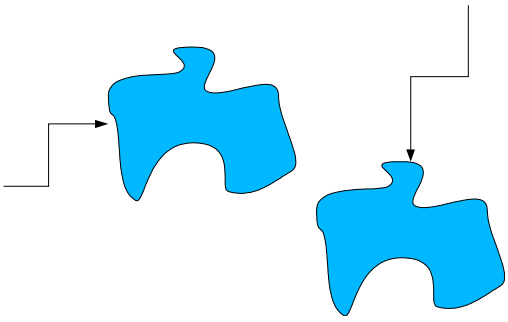
The default gluepoints are located at the centers of the lines forming the edges of the selection rectangle around an object. As you can see on the following figure, this means that the gluepoints are not necessarily located on the contour of the object:



When you move one of the ends of a connector over an object, its gluepoints become visible. You can drop the end of the connector onto one of the gluepoints. Afterwards, whenever either the connector or the object are moved, the end of the connector will remain attached to the object gluepoint.



You can also drop the end of the connector onto the object. In this case, when you move the object or the connector, OpenOffice.org will automatically choose the best gluepoint in order to avoid a too lengthy connector:



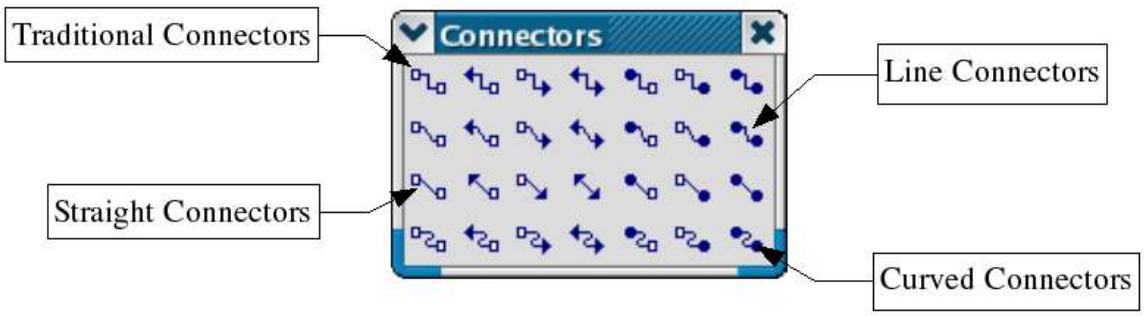
Wherever possible, OpenOffice.org will attempt to avoid drawing the connector over the top of the object.

You can always break the link between a connector and an object by moving the end of the connector away from the gluepoint to which it was attached.

As with all objects, control points are associated with connectors in order to facilitate their drawing. The main control point is located in the middle of the connector and lets you decide on the size of each segment either side of the control point.

Connector toolbar

The connector toolbar contains a large number of buttons.



As shown by the figure above, the connectors can be grouped into four categories. Each category is subdivided into 7 connector types depending on the arrowhead for each end.

The buttons in this row let you draw traditional connectors like the ones you have seen on the previous pages.

These connectors are made up of a line segment and two smaller segments at the horizontal or vertical ends.

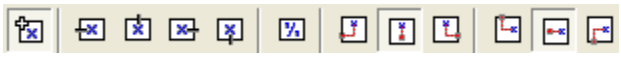
These connectors are comprised of a simple straight line.

These connectors are based on Bezier curves.

Editing Gluepoints

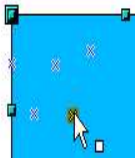
Gluepoint management is handled by a special toolbar. This toolbar isn't visible by default. To display it, press the button in the option toolbar.

The gluepoint toolbar looks like this:



Here's a brief description of the way these buttons work:

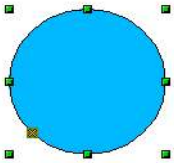
This button lets you insert a new gluepoint. If the object is filled, the point can be inserted anywhere within the object and not only on its contour. After you've chosen this tool, click on the object to add the gluepoints.



The gluepoints remain visible for as long as the button is pressed down. They are displayed as little blue crosses and the gluepoint that is currently selected appears highlighted. You can move the gluepoints with the mouse and delete them with the [Del] key.

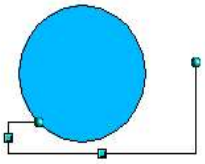
These four buttons let you choose the directions of movement that are allowed around the junction of a connector gluepoint. You can also select several of these buttons for any given gluepoint. Here's an example of their use:

Here's a very simple drawing to which a gluepoint has been added.

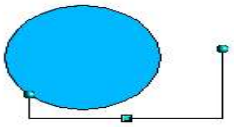


By default, connector lines can attach themselves to this point from any direction.

Now click on the . The effect of this is to force any connector placed on the gluepoint to come in from the left as shown in the following drawing:

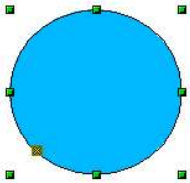


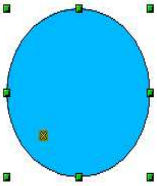
If, when you are in gluepoint edit mode, you click on the button, you can add a new possible direction to a gluepoint. If we keep the preceding example, this would give:



The addition of this extra direction enabled OpenOffice.org to draw a shorter connector.

When this button is pressed (as it is by default), any resizing of an object will cause gluepoints to move with the associated object. If this button is deactivated, the gluepoint will not move, as shown by the following illustrations:





When the button is deactivated, the last six buttons on the toolbar that were grayed out now become usable. These buttons let you choose how the glue points will be rearranged when the object is re dimensioned.

These three buttons let you choose the horizontal positioning of the gluepoint. You can choose to maintain the same position with respect to the left edge (1st button), with respect to the center (2nd button) or with respect to the right edge (3rd button).

These three buttons let you choose the vertical positioning of the gluepoint. You can choose to maintain the same position with respect to the upper edge (1st button), with respect to the center (2nd button) or with respect to the lower edge (3rd button).