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# Chart Plugin

Create PNG or GIF charts to visualize Foswiki tables

This plugin helps you visualize data in Foswiki tables as charts, using a default linear scale or an optional semilogarithmic scale.

Five types of charts, *line*, *area*, *bar*, *scatter* and *combo*, are currently available:

Type of Chart	Name	What it Does	Example
Area	area	Shows a chart using areas under a line to represent the data	<p><b>Area Example</b></p>
Bar	bar	Shows a chart using bars to represent the data	<p><b>Bar Chart Example</b></p>
Line	line	Shows a chart using simple lines, points only, or lines with points to represent the data. <b>Note:</b> Any areas that fall behind already drawn areas are drawn as lines to make them visible	<p><b>Line Example</b></p>
Scatter	scatter	Shows a scatter chart (XY data points) and allows mixing area or bar with line, point, and pline	<p><b>Scatter Example</b></p>
Combo	combo	Shows a chart combining the features from area or bar with line, point, and pline <b>Note:</b> Formally known as arealine which is still supported	

Type of Chart	Name	What it Does	Example
			

The `%CHART{...}%` variable gets expanded to an image representing the chart. Parameters and global settings determine the type of chart, dimensions, and values.

## ChartPlugin Global Settings

Plugin settings are stored as preferences variables. To reference a plugin setting write `%<plugin>_<setting>%`, for example, `%CHARTPLUGIN_TYPE%`

- Set DEBUG to 1 to get debug messages in `data/debug.txt`. Default: 0
  - ◆ Set DEBUG = 0
- Default chart used: area, line, bar, scatter or combo. Default: line
  - ◆ Set TYPE = line
- Default dimensions, scale and colors for a chart. See details in the syntax rules.
  - ◆ Set WIDTH = 400
  - ◆ Set HEIGHT = 250
  - ◆ Set AREA\_COLORS = #FF3333, #FFFF33, #33FF33, #CC66FF, #99FFFF, #FFCC00, #008000, #FF8080, #3366CC, #800080
  - ◆ Set LINE\_COLORS = #FF0000, #FFCC00, #00CC00, #FF00FF, #33CCCC, #FF8000, #009900, #FF6666, #3333FF, #800080
  - ◆ Set BGCOLOR = #FFFFFF, #FFFFFF
- Define the grid color. When `xgrid/ygrid = "on"`, then just use the first color when drawing grid lines. When their value is "dot", then use the full specification for drawing the grid lines ("transparent" can be used to introduce holes in the line).
  - ◆ Set GRIDCOLOR = #808080, #808080, #808080, transparent, transparent, transparent
  - ◆ Set NUMYGRIDS = 9
- Define what to do when an empty table cell is found. "none" means assume no default value. A value of "10" would mean empty cells would be assumed to have a value of 10
  - ◆ Set DEFAULTDATA = none
- Define the default scale: linear or semilog
  - ◆ Set SCALE = linear
- Define the number of pixels wide lines are drawn with
  - ◆ Set LINEWIDTH = 3
- Define the number of pixels (in both the X and Y directions) to use when drawing a point
  - ◆ Set POINTSIZE = 5

- Define bar chart specific parameters. BARSPACE defines the space (in pixels) between bars. BARLEADINGSPACE defines the leading space (in pixels) before the first bar. BARTRAILINGSPACE defines the trailing space (in pixels) after the last bar
  - ◆ Set BARLEADINGSPACE = 6
  - ◆ Set BARTRAILINGSPACE = 6
  - ◆ Set BARSPACE = 5


## Syntax Rules


The `%CHART{ . . . }%` variable gets expanded to an image representing the chart.

- Some parameters expect a range of table cells, using **extended** SpreadsheetPlugin syntax:
  - ◆ A single table cell can be addressed as **R1:C1**. Cell addresses:

<b>R1:C1</b>	<b>R1:C2</b>	<b>R1:C3</b>	<b>R1:C4</b>
<b>R2:C1</b>	<b>R2:C2</b>	<b>R2:C3</b>	<b>R2:C4</b>

- A range of table cells is defined by two cell addresses separated by ". . ". For example, "row 1-20, column 3" is: **R1:C3 . . R20:C3** and "row 15-5, column 2" is: **R15:C2 . . R5:C2**
- Ranges can be discontinuous. Discontinuous ranges are joined using "+". For example: **R4:C1 . . R5:C2+R9:C1 . . R15:C2**.
- When you are specifying datasets, you specify the range so that you have one data set per row (column). You can also specify multiple data sets using discontinuous blocks of cells; for example, **R4:C1 . . R5:C2, R9:C1 . . R10:C2** specifies 4 data sets: R4:C1..R4:C2, R5:C1..R5:C2, R9:C1..R9:C15 and R10:C1..R10:C2
- + has higher precedence than ,

<b>%CHART% Parameter</b>	<b>Comment</b>	<b>Default </b>
ymin	Minimum value drawn on the Y axis	The minimum value specified by data
ymax	Maximum value drawn on the Y axis	The maximum value specified by data
web	The web in which to find <code>topic</code> (specified below) in which to find the Foswiki tables	The current web
topic	The topic in which to find the Foswiki tables	The current topic
legend	Legend shown to the right of the chart. For example "R1:C3 . . R1:C6" would take all of row 1 starting at column 3 and going through column 6 as the name/legend of each set of data points	None; no legend if not specified
name	Name to uniquely identify the chart file that is auto-created.	None; is required for all charts
data	The source data to build the chart, defined as a range of table cells. For example for <code>type="line"</code> , a <code>data="R2:C3 . . R999:C6"</code> would say that four lines were to be drawn with first line being rows 2-999 column 3 and last line being rows 2-999 column 6.	None; is required for all charts
xaxis	X-Axis labels: The values are defined as a range of table cells. In case of scatter graph, <code>xaxis</code> represents the actual X values. The range also defines the orientation -- row or column oriented (if specified). For example "R2:C2 . . R999:C2" would take all of column 2 starting at row 2 and going through row 999. It would also denote that all remaining data is oriented columnar.	None. Is required for <code>type="scatter"</code> . If not specified, then no X axis labels shown and data assumed to be in columnar format.
title	The title placed at the top of the chart	None
xlabel	The label placed under the X axis describing the X values	None

%CHART% Parameter	Comment	Default 
ylabel	The label placed to the left of the Y axis describing the Y values	None
(other parameters)	Other parameters are passed on to the <code>img</code> tag. Useful to add additional image parameters like <code>align="right"</code>	None
yticks	Number of tic marks to draw between Y axis grid lines.	If <code>scale="semilog"</code> , then <code>yticks="10"</code> , else defaults to "0"
width	Defines the overall width of the chart in pixels.	Global WIDTH setting
type	The type of chart to create. One of "area", "bar", "line", "scatter", "combo"	Global TYPE setting
scale	The scale to use when creating the chart. "linear" or "semilog"	Global SCALE setting
pointsize	Size of data points in pixel	Global POINTSIZE setting
numygrids	Number of Y axis grids drawn	Global NUMYGRIDS setting
linewidth	Width of data lines in pixel	Global LINEWIDTH setting
colors	A list of colors defining the color of each set of data points.	Global LINE_COLORS setting for lines; global AREA_COLORS setting for area
height	Defines the overall height of the chart in pixels.	Global HEIGHT setting
gridcolor	Colors/style of the grid (if any). If <code>xgrid</code> or <code>ygrid</code> = "on" then use the first <code>gridcolor</code> for drawing solid grid lines. If <code>xgrid</code> or <code>ygrid</code> = "dot", then use the full set of colors to define the line style for drawing the grid lines ("transparent" can be used to introduce holes in the line)"	Global GRIDCOLOR setting
defaultdata	If there is sparse data, then use the value specified by <code>defaultdata</code> to fill in the missing data. A value of "none" means only draw actual data points.	Global DEFAULTDATA setting
bghcolor	Background color of the area surrounding the chart. For example, "#E7E7E7" sets a light gray background. Optionally specify a second values for the chart background itself. For example, "#E7E7E7, #FFFFC0" defines a chart with a light yellow background on a light gray surrounding.	Global BGCOLOR setting
alt	Alternate text for chart image	Empty alt tag
numxgrids	Number of X axis grids drawn. This can be used if there are a large number of X axis data points such that the X axis labels overlap.	Draw all X-Axis labels
subtype	- for <code>type="combo"</code> <code>subtype="area, bar, line, point, pline"</code> (note: you can not mix area and bar on the same chart)	All but the last data set are drawn as "area" and the last is drawn as "line"
subtype	- for <code>type="scatter"</code> <code>subtype="area, bar, line, point, pline"</code> Note: you cannot mix area and bar on the same chart. Note: It is not recommended using showing a bar on a scatter chart as the X axis placement is skewed with bar and will not exactly line up with drawn X axis values which will defeat the purpose of using scatter in the first place.	"point"
yaxis	Y-Axis labels: "on" to show the labels, "off" for no labels.	"off"

%CHART% Parameter	Comment	Default <input checked="" type="checkbox"/>
datalabel	Show data labels: "on" for labels, "box" for label in a box, "off" for none. It can also be a list like "off, off, off, box" to show values in a box for the fourth set of data points only.	"off"
subtype	- for type="line" = subtype="line, point, pline" (point line)	"line"
xgrid	Grid shown for X axis: "on" for solid grid lines, "dot" for dotted grid lines, "off" for none.	"dot"
ygrid	Grid shown for Y axis: "on" for solid grid lines, "dot" for dotted grid lines, "off" for none.	"dot"
subtype	- for type="bar" = subtype="bar"	"bar"
subtype	- for type="area" = subtype="area"	"area"
table	Foswiki table used to build the chart. A numerical value refers to the table number, where "1" is the first table seen in a topic. Any other non-numeric string refers to a named table defined by the TABLE variable with a name parameter. For example, table="trends" refers to the table that is preceded by %TABLE{ name="trends" }%.	"1"
xaxisangle	Angle the X-Axis labels are drawn. Only two angles are supported at this time, "0" draws horizontal labels, other numbers draw vertical labels	"0"
subtype	Sub type of chart. Supported values depend on chart type:	
subtype	You can use a comma delimited list of values to set a specific subtype for each data set. For example "area, area, point, line" would say that the first two data sets are areas, the third is point and the last one is a line	

**Note:** To support legacy syntax, datatype maps to subtype, arealine maps to combo.

## Examples

Assuming the following three Foswiki tables. The first shows the data oriented in columns while the seconds shows the data oriented in rows

**Table 1:**

Year	Actual
1998	9
1999	14
2000	19
2001	25
2002	39

**Table 2:**

Year	1998	1999	2000	2001	2002	X	Y1	Y2	Y3
Low	8	10	13	17	22	3	1	3	7
Target	10	12	17	20	25	6	5	8	10
High	12	15	19	24	29	11	3	5	9
Actual	9	14	15	19	27	10	1	3	7
						8	2	3	8

**Table 3:**

X	Y1	Y2	Y3
3	1	3	7
6	5	8	10
11	3	5	9
10	1	3	7
8	2	3	8

Type of chart	You type	You should get...	...if installed
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Type of chart	You type	You should get...	...if installed
area	<p>Multiple area</p> <pre>%CHART{ type="area" name="area1" table="exampleTable2" data="R2:C2..R5:C6" xaxis="R1:C2..R1:C6" legend="R2:C1..R5:C1" width="225" height="200" }%</pre>		
bar	<p>Multiple bars</p> <pre>%CHART{ type="bar" name="bar1" table="exampleTable2" data="R3:C2..R5:C4" xaxis="R1:C2..R1:C4" legend="R3:C1..R5:C1" ymin="0" width="225" height="200" }%</pre>		
line	<p>Simple line</p> <pre>%CHART{ type="line" name="line1" table="exampleTable1" data="R2:C2..R6:C2" xaxis="R2:C1..R6:C1" legend="R1:C2..R1:C2" width="225" height="200" }%</pre>		
line	<p>Multiple lines</p> <pre>%CHART{ type="line" name="line2" table="exampleTable2" data="R2:C2..R5:C6" xaxis="R1:C2..R1:C6" legend="R2:C1..R5:C1" width="225" height="200" }%</pre>		
scatter	<p>Multiple scatter</p> <pre>%CHART{ type="scatter" subtype="pline" name="scatter1" table="exampleTable3" data="R2:C2..R6:C4" xaxis="R2:C1..R6:C1" legend="R1:C2..R1:C4" numxgrids="4" linewidth="1" width="225" height="200" }%</pre>		

Type of chart	You type	You should get...	...if installed
combo	Combo with area, pline, point, & line  <pre>%CHART{ type="combo" subtype="area, pline, point, line" name="combo1" table="exampleTable2" data="R2:C2..R5:C6" xaxis="R1:C2..R1:C6" legend="R2:C1..R5:C1" width="225" height="200" }%</pre>		
combo	Combo with bar, pline, point, & line  <pre>%CHART{ type="combo" subtype="bar, pline, point, line" name="combo2" table="exampleTable2" data="R2:C2..R5:C6" xaxis="R1:C2..R1:C6" legend="R2:C1..R5:C1" width="225" height="200" }%</pre>		

The "if installed" column shows images instead of variables in case the plugin is installed correctly.

## Output

- A graphics file in PNG or GIF format is created containing the chart results. The file is placed in %PUBURLPATH%/WEB%/TOPIC%/\_ChartPlugin\_<type>\_<name>.png or .gif (GIF for GD version 1.19 or older)
- %CHART{...}% gets expanded to an <img ... /> image tag.

## Error Handling

If the required parameters are not defined, then an error message is returned or an <img ... /> image tag is returned pointing to a graphic containing the error message.

## Plugin Installation Instructions

You do not need to install anything in the browser to use this extension. The following instructions are for the administrator who installs the extension on the server.

Open configure, and open the "Extensions" section. Use "Find More Extensions" to get a list of available extensions. Select "Install".

If you have any problems, or if the extension isn't available in configure, then you can still install manually from the command-line. See <http://foswiki.org/Support/ManuallyInstallingExtensions> for more help.



- Check above examples if the "if installed" column shows images instead of variables.
- Check ChartPluginTests for some more tests










## Plugin Info

Plugin Author:	Current maintainer Foswiki:Main.KennethLavrsen, original authors from old project: TWiki:Main.PeterThoeny, TWiki:Main.TaitCyrus
Copyright ©:	2004-2006, TWiki:Main.PeterThoeny, TWiki:Main.TaitCyrus; 2008 Kenneth Lavrsen and Foswiki Contributors
License:	GPL (GNU General Public License)
Release:	13 Mar 2010
Version:	6743 (2010-03-14)
Change History:	
13 Mar 2010:	Foswiki:Main.WillNorris: work around "insecure dependency" error with certain perl/gd/cpan combinations (Foswikitask:Item1322)
07 Jan 2010:	Foswiki:Main.AndrewJones, Foswiki:Main.SvenDowideit: Add dependencies (Foswikitask:Item8381)
13 Oct 2009:	Kenneth Lavrsen: Fixed problem where the plugin could not chart the contents of a table if the table is at the end of a topic
08 Dec 2008:	Kenneth Lavrsen: Changed the author to myself. TWiki:Main.TaitCyrus is the original author but has not been maintaining this since and is not registered user on fork. So now I officially take the task as maintainer. Plugin is changed to Foswiki namespace and tested and works under Foswiki 1.0.0
18 May 2007:	Added discontinuous ranges - Foswiki:Main.CrawfordCurrie
16 Nov 2004:	V1.401 - Added benchmarks (no code changes)
30 Aug 2004:	V1.400 - Added support for subtype="bar" (includes various global bar settings), updated <code>gridcolor</code> to not only define the grid color but allowing the user to define the line style (for drawing user defined dotted lines), add a global for how wide lines are drawn instead of a hard coded value, change the order of how things are drawn so now the order is: areas, grid lines and X/Y axis labels, bars, lines/points/plines, rectangle around chart, data point labels, chart title/X/Y labels, and finally the legends.
13 May 2004:	V1.300 - Added support for type="scatter"; renamed type="arealine" to "combo" (arealine is undocumented); renamed datatype to subtype (datatype is undocumented); added subtype options "point" and "pline", added new settings <code>GRIDCOLOR</code> , <code>DEFAULTDATA</code> , <code>POINTSIZE</code> ; fixed bug with how the number of grids were drawn
17 Oct 2003:	V1.201 - Fix boundary cases with <code>semilog</code> scale
16 Oct 2003:	V1.200 - Add new options of <code>scale</code> and <code>ytics</code> .
16 Jun 2003:	V1.100 - Add support for reversed tables (R999..R1), add new options of <code>xaxisangle</code> , <code>numxgrids</code> , and <code>defaultdata</code> , and allow sparse data.
7 Oct 2002:	V1.003 - Improved performance, fixed bugs with color allocation, auto-legend placement and parsing of numbers in tables. Also bumped the upper value when numbers switch from decimal format to engineering format
13 Sept 2002:	V1.002 - Add support for better placement of legends so they don't overlap, add <code>auto ymin/ymax</code> determination if not specified, add <code>bgcolor</code> and <code>numygrids</code> options
27 Jun 2002:	V1.001 - Data range specified is clipped to actual table size; more forgiving data parsing by extracting first numeral from a table cell, e.g. extract 25 from <code>&lt;u&gt;25%&lt;/u&gt;</code>
20 Jun 2002:	Initial version (V1.000)

Dependencies:	Name	Version	Description	
	gd	>0	Required.	
	GD	>=0.01	Required.	
	POSIX	>0	Required.	
Plugin Home:	<a href="http://foswiki.org/Extensions/ChartPlugin">http://foswiki.org/Extensions/ChartPlugin</a>			
Support:	<a href="http://foswiki.org/Support/ChartPlugin">http://foswiki.org/Support/ChartPlugin</a>			

**Related Topics:** DefaultPreferences, SitePreferences, Plugins

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Topic revision: r0 - 17 Nov 2004 - 07:56:37 - ProjectContributor

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