




Botanicus

A · U · S · T · R · A · L · I · A

Botanicus Australia Pty Ltd

NATURAL RESOURCE CONSULTANTS

P.O. Box 160, Sunshine, Victoria, Australia 3020
Phone: +61 (03) 9311 5822. Mobile: 041 830 3437
Email: scropper@botanicusaustralia.com.au
Webpage: <http://www.botanicusaustralia.com.au>

Author Simon Cropper (Principal Consultant).
Publication 23 April 2010.
Copyright © Botanicus Australia Pty Ltd
License  [Creative Commons](https://creativecommons.org/licenses/by-nc-nd/2.5/au/) (Attribution - Noncommercial - No Derivative Works 2.5 Australia)

The use of reStructured Text in the preparation of manuals for Free & Open Source Software

METADATA	
Title	The use of reStructured Text in the preparation of manuals for FOSS
Series	Technology Blog
Workflow Process	Participation in Free and Open Source Software Projects
Description	An explanation of how to setup syntax highlighting for reStructured Text in the text editors gEdit and Diffuse.
Software	gEdit v2.28.0, Diffuse v0.3.3-0.4.1

What are Botanicus Australia's Technology Blogs: These are articles on a range of technological issues I have encountered, investigated, compiled data on and/or value added to for use in my company. They are provided 'as is' for others to help facilitate the use of these technologies, especially in the Natural Resource Management Industry.

Introduction

Markup languages are commonly used in the production of text for Wiki's and Content Management Systems. The primary aim of markup is to allow an author to quickly flag the style of text with simple character combinations. Typically text is preceded or encompassed by these markup strings. An example, is putting an asterisk (*) at the start and end of a word to indicate that the text should be rendered as italics when published (i.e. *Eucalyptus* becomes *Eucalyptus*). Documents using markup are usually prepared as simple text with editors like gEdit (Linux) or Notepad++ (Windows).

While participating in the evaluation of the gvSIG website as the creation tool and repository for community content I was exposed to [reStructured Text](#) - the markup of choice for the gvSIG team responsible for creation of website



content. Although relatively easy to learn I found few editors had syntax highlighting for reStructured Text or if they did it was very limited.

Consequently I began the process of identifying programs that could readily be used in Linux and Windows (the two operating systems I use the most), that had syntax highlighting capabilities and could be customized. After trialling a variety of programs, the two I liked the most were gEdit and Diffuse.



[gEdit](#), the text editor distributed with the Gnome Desktop, already had a basic syntax file to highlight reStructured Text and only needed minor changes to accommodate all the markup used by the gvSIG Team.



[Diffuse](#), a programming editor designed to display text files and their differences side by side, was identified as a valuable tool for comparing (a) two versions of the same file in the same language or (b) a file and its translation, side by side with full syntax highlighting.

ReStructured Text

This markup language is quite comprehensive and not all markup is used by the gvSIG team. Consequently I created a test file containing the most commonly used commands (Figure 1). The main aim was to create a file that could be used to test the syntax highlighting capabilities of gEdit and Diffuse.

The basics of syntax highlighting






In most of the editors I reviewed, syntax highlighting consisted of two components – a routine that parsed the text looking for patterns and another that rendered the output text in a particular format. Reference data used by both these routines can be stored in one file or several files. The location of these files can also vary depending on what operating system the program is installed (e.g. Windows vs Ubuntu).

It is worth noting here that gEdit and Diffuse use '[regular expressions](#)' to define patterns. Unfortunately they both use slightly different (undocumented) variations of this standard and parse a 'regular expression' in different (undocumented) ways. The upshot is many hours of trial and error to uncover the correct method of capturing a particular string.






Actual syntax highlighting (i.e. rendering text a particular color) is a little less problematic. I have provided enough comments in this tutorial that changing colors to your preferences (if needed) should be relatively easy.




Figure 1. The reStructured Text Test File and the rendered output using the gvSIG 'Plone-based' Website.

Original reStructured Text used in Test Text File	Rendered output on gvSIG Website
<pre>Based on the `Quick reStructured Text Guide Quick Guide <http://docutils.sourceforge.net/ docs/user/rst/quickref.html#title>`_</pre>	<p>Based on the  Quick reStructured Text Guide Quick Guide</p>
<pre>Base file showing syntax highlighting capabilities of various editors.</pre>	<p>Base file showing syntax highlighting capabilities of various editors.</p>
<pre>reStructured Text ===== Inline Markup ----- **This is bold at the start of the line** **This is bold several characters in from the start of the line** *This is italic at the start of the line* *this is italic several characters in from the start of the line* ``this is a literal at the start of the line`` ``this is a literal several characters in from the start of the line`` `this is a grouped phrase at the start of the line` `this is a grouped phrase several characters in from the start of the line`</pre>	<p>reStructured Text</p> <p>Inline Markup</p> <p>This is bold at the start of the line This is bold several characters in from the start of the line</p> <p><i>This is italic at the start of the line</i> <i>this is italic several characters in from the start of the line</i></p> <p>this is a literal at the start of the line this is a literal several characters in from the start of the line</p> <p>this is a grouped phrase at the start of the line <i>this is a grouped phrase several characters in from the start of the line</i></p>
<pre>External Hyperlink Targets ----- `this is a grouped phrase`_ `this is a grouped phrase`_ SingleWordHyperlink_ SingleWordHyperlink_</pre>	<p>External Hyperlink Targets</p> <p> this is a grouped phrase  this is a grouped phrase</p> <p> SingleWordHyperlink  SingleWordHyperlink</p>



Original reStructured Text used in Test Text File	Rendered output on gvSIG Website
<p>Internal Hyperlink Targets ----- <code>`reStructured Text`_</code></p>	<p>Internal Hyperlink Targets reStructured Text</p>
<p>Enumerated Lists ----- 1. Enumerated list No. 1 2. Enumerated list No. 2 3. Enumerated list No. 3 4. Enumerated list No. 4 5. Enumerated list No. 5</p>	<p>Enumerated Lists</p> <ol style="list-style-type: none">1. Enumerated list No. 12. Enumerated list No. 23. Enumerated list No. 34. Enumerated list No. 45. Enumerated list No. 5
<p>Autocomplete lists with inline link ----- #. <code>`Google <http://www.google.com.au>`_</code> #. <code>`Google <http://www.google.com.au>`_</code> #. <code>`Google <http://www.google.com.au>`_</code> #. <code>`Google <http://www.google.com.au>`_</code> #. <code>`Google <http://www.google.com.au>`_</code></p>	<p>Autocomplete lists with inline link</p> <ol style="list-style-type: none">1.  Google2.  Google3.  Google4.  Google5.  Google



Original reStructured Text used in Test Text File	Rendered output on gvSIG Website
<p>Bulleted List ----- .. can use -, +, * - list square point - list - list - list - list - list - list</p>	<p>Bulleted List</p> <ul style="list-style-type: none">■ list square point■ list■ list■ list■ list■ list■ list
<p>Literal Blocks ----- .. use of :: to precede 'code' :: this is actual text indented to make the point that the formatting will be preserved</p>	<p>Literal Blocks</p> <div style="border: 1px solid gray; padding: 10px; background-color: #e0e0e0;"><pre> this is actual text indented to make the point that the formatting will be preserved</pre></div>
<p>Figures ----- .. figure:: http://www.google.com.au/intl/en_au/images/logo.gif *Figure 1:* This is the google logo.</p>	<p>Figures</p>  <p><i>Figure 1:</i> This is the google logo.</p>



Original reStructured Text used in Test Text File	Rendered output on gvSIG Website				
<pre>Tables ----- +-----+ **Version Control User Manual gvSIG** +-----+-----+ GvSIG 1.9 User Manual 1. Documentation is included on the gvSIG project website in Spanish. 2. English translations are currently being prepare the English-speaking gvSIG community. +-----+-----+</pre>	<p>Tables</p> <table border="1"><thead><tr><th colspan="2">version control user manual gvSIG</th></tr></thead><tbody><tr><td>GvSIG 1.9 User Manual</td><td><ol style="list-style-type: none">1. Documentation is included on the gvSIG project website in Spanish.2. English translations are currently being prepare the English-speaking gvSIG community.</td></tr></tbody></table>	version control user manual gvSIG		GvSIG 1.9 User Manual	<ol style="list-style-type: none">1. Documentation is included on the gvSIG project website in Spanish.2. English translations are currently being prepare the English-speaking gvSIG community.
version control user manual gvSIG					
GvSIG 1.9 User Manual	<ol style="list-style-type: none">1. Documentation is included on the gvSIG project website in Spanish.2. English translations are currently being prepare the English-speaking gvSIG community.				
<pre>Chapter ===== Section -----</pre>	<p>Chapter Section</p>				
<pre>.. this is a comment .. _`this is a grouped phrase`: http://www.google.com.au .. _SingleWordHyperlink: http://www.google.com.au</pre>					



[gEdit](#), the text editor distributed with the Gnome Desktop, already had a basic syntax file to highlight reStructured Text and only needed minor changes to accommodate all the markup used by the gvSIG Team.

What does the test text file look like in the program?

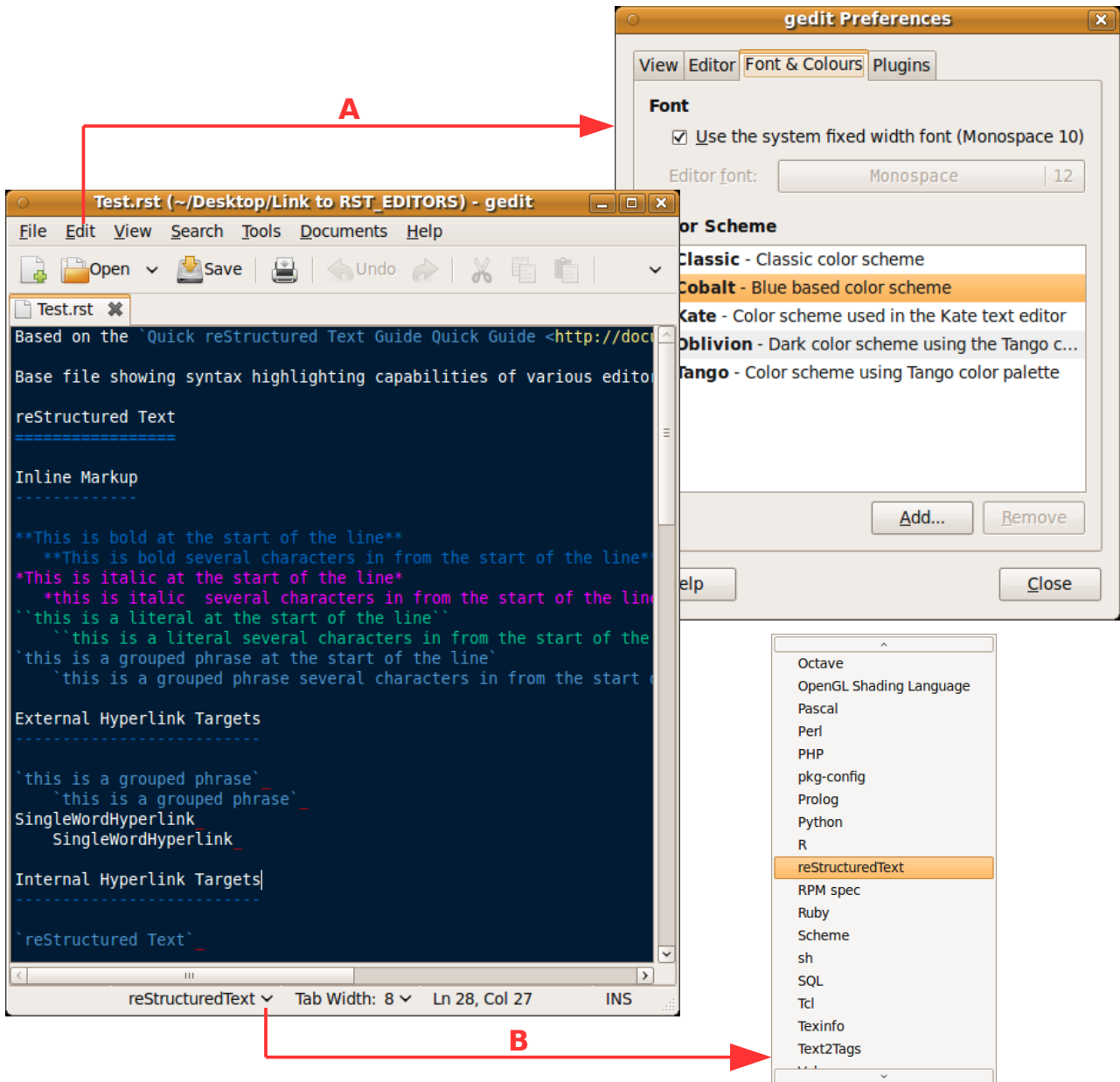


Figure 2. An image showing what the main screen of gEdit looks like when seen with reStructured Text syntax highlighting enabled. **A**, The Color Scheme is selected in the Preferences Dialog. **B**, The markup language can be selected from the drop down list on the status bar or by the menu system.

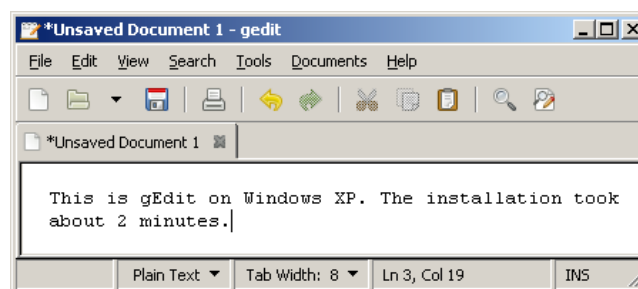


How to install gEdit onto your operating system

In Ubuntu 9.10 Karmic, gEdit is installed by default. You should find it in the Applications Menu. If for some reason you can't find the program you can readily install it from the Ubuntu Software Center (link under Applications Menu).



Ready-built binaries to install gEdit on Microsoft Windows are available from the live.gnome.org website. Download the latest executable from the ftp server and run.



Files responsible for defining language syntax and color

There are two files involved in syntax highlighting:



`/usr/share/gtksourceview-2.0/language-specs/rst.lang`
`/usr/share/gtksourceview-2.0/styles/cobalt.xml1.`

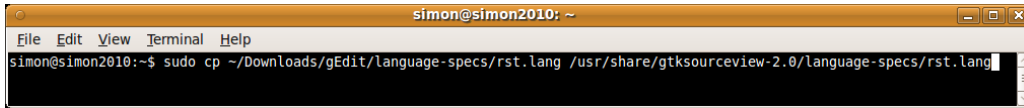


`C:\Program Files\gedit\share\gtksourceview-2.0\language-specs\rst.lang`
`C:\Program Files\gedit\share\gtksourceview-2.0\styles\cobalt.xml`

¹ The file cobalt.xml will already be present as it is installed by default.



The file `rst.lang` contains the language patterns while `cobalt.xml` has the highlight color assigned to each pattern. Copy the files provided in the download into the respective directory. Take note that in Ubuntu, both files are outside the user home directory so requires you to be `root` to edit and copy the files to the appropriate directories (see figure below). In Windows XP just use Windows Explorer.



You should not need to edit `rst.lang` unless you intend to insert some new language patterns. If you want to attempt this I have provided some links to some documentation that may be helpful at the end of this article.

The file `cobalt.xml` has several parts that allow you to customize colors - the initial `<!-- Colors -->` section where vernacular names are matched to hexadecimal color codes and the final `<!-- reStructured Text -->` section where syntax pattern names are matched with the vernacular names. This may be necessary as I have only provided the sample file for the Cobalt Color Scheme.

```
<style-scheme id="cobalt" name="Cobalt" version="1.0">
<author>Will Farrington</author>
<_description>Blue based color scheme</_description>

<!-- Colors -->
<color name="faded_yellow" value="#ffee80"/>
<color name="bright_orange" value="#ff9d00"/>
<color name="faded_orange" value="#ffb054"/>
<color name="nail_polish_pink" value="#ff0044"/>
<color name="neon pink" value="#ffdd00"/>
<color name="sky_blue" value="#0088ff"/>
<color name="teal_blue" value="#00ffbb"/>
<color name="light blue" value="#0065bf"/>
<color name="medium blue" value="#003b70"/>
<color name="dark blue" />
<color name="black blue" />
<color name="white" />
<color name="pale grey" />
<color name="steel grey" />
<color name="spring green" />
<color name="sea green" />
<color name="light grey" />
<color name="dark maroon" />
<color name="bluish grey" />
<color name="steelblue3" />
<color name="magenta" />
<color name="purple" />
<color name="red" />

<!-- ReStructured Text -->
<style name="rst_strong" foreground="light blue"/>
<style name="rst_emphasis" foreground="magenta"/>
<style name="rst_literal" foreground="sea green"/>
<style name="rst_comment" foreground="bright_orange"/>
<style name="rst_phrase" foreground="steelblue3"/>
<style name="rst_hyperlink" foreground="steelblue3"/>
<style name="rst_url" foreground="faded_yellow"/>
<style name="rst_underscore" foreground="red"/>
<style name="rst_bullet" foreground="sky_blue" bold="true"/>
<style name="rst_listnum" foreground="bright_orange"/>
<style name="rst_section" foreground="light_blue" bold="true"/>
<style name="rst_table" foreground="light blue"/>
<style name="rst_directives" foreground="bright_orange"/>
<style name="rst_block" foreground="red"/>
```

In order to update another Colour Scheme, it is only necessary to cut and paste the `<!-- reStructured Text -->` section into the Color Scheme XML file and ensuring all the vernacular names referenced are defined in the `<!-- Colors -->` section. In order to improve contrast between the text and the Color Scheme's background you may need to change the font color to another existing one or introduce some new ones. HTML [Colour Pickers](#) or [Color Charts](#) are readily found on the Internet.



Once the files have been copied to the respective directories open the file `Test.rst`, select the correct Color Scheme (Figure 1A) and markup language (Figure 1B). The file should now have the correct syntax highlighting.

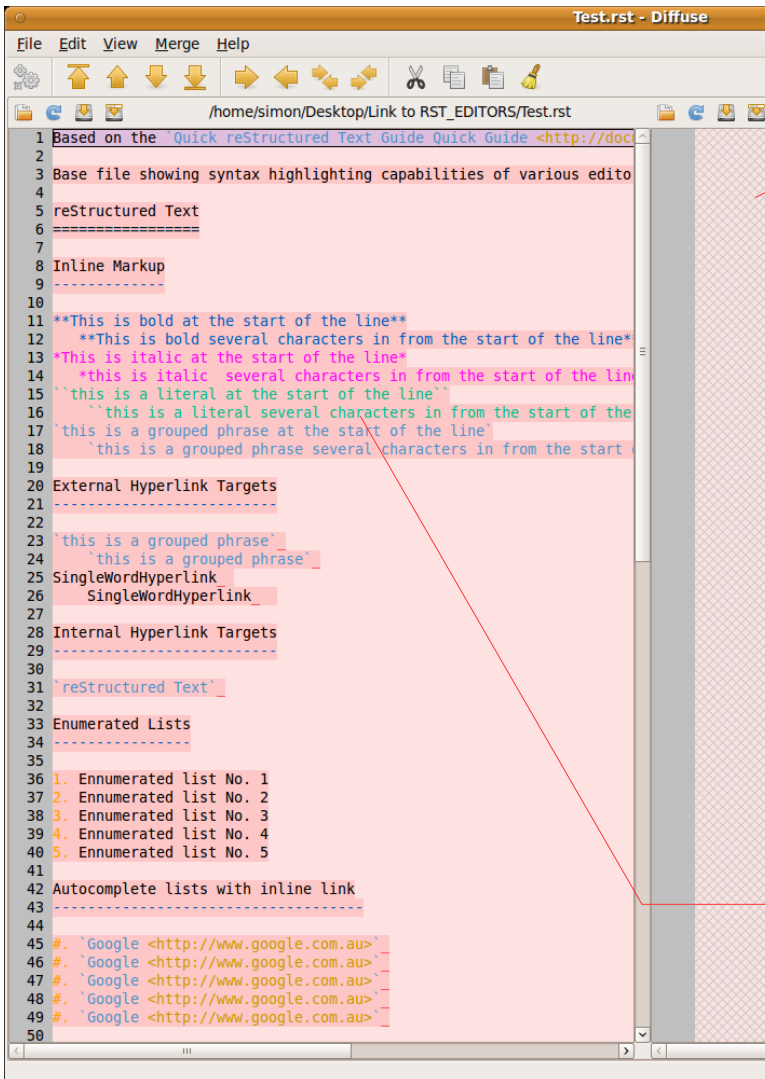
Other considerations

The program gEdit does not automatically see the RST file extension and requires to be told to use reStructured Text markup - at least once for each file.



[Diffuse](#), a programming editor designed to display text files and their differences side by side, was identified as a valuable tool for comparing (a) two versions of the same file in the same language or (b) a file and its translation, side by side with full syntax highlighting.

What does the test text file look like in the program?



```
1 Based on the Quick reStructured Text Guide Quick Guide <http://doc
2
3 Base file showing syntax highlighting capabilities of various edito
4
5 reStructured Text
6 =====
7
8 Inline Markup
9 -----
10
11 This is bold at the start of the line
12 This is bold several characters in from the start of the line
13 This is italic at the start of the line
14 this is italic several characters in from the start of the lin
15 this is a literal at the start of the line
16 this is a literal several characters in from the start of the
17 this is a grouped phrase at the start of the line
18 this is a grouped phrase several characters in from the start
19
20 External Hyperlink Targets
21 -----
22
23 this is a grouped phrase
24 this is a grouped phrase
25 SingleWordHyperlink
26 SingleWordHyperlink
27
28 Internal Hyperlink Targets
29 -----
30
31 reStructured Text
32
33 Enumerated Lists
34 -----
35
36 1. Enumerated list No. 1
37 2. Enumerated list No. 2
38 3. Enumerated list No. 3
39 4. Enumerated list No. 4
40 5. Enumerated list No. 5
41
42 Autocomplete lists with inline link
43 -----
44
45 #. Google <http://www.google.com.au>
46 #. Google <http://www.google.com.au>
47 #. Google <http://www.google.com.au>
48 #. Google <http://www.google.com.au>
49 #. Google <http://www.google.com.au>
50
```

Diffuse is a file comparison utility so displays two panes. In this figure only one side of the program's GUI is shown.

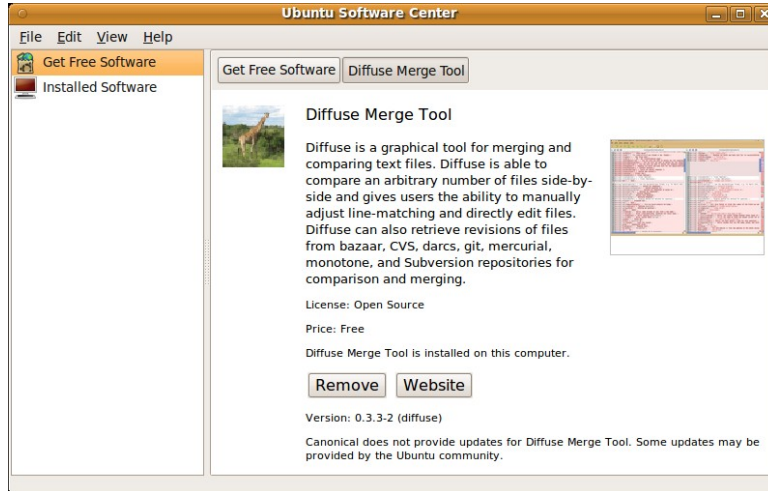
In Diffuse, if correctly setup, the program detects the RST extension and applies the correct syntax highlighting. You can not readily change the Color Scheme as background colors are used to highlight differences between files.

Figure 3. An image showing what the main screen of Diffuse looks like when seen with reStructured Text syntax highlighting enabled. Note that if you open the file using the context menu (right click) the file opens in the right pane by default. I have moved the file to the left pane using Shift+Ctrl+Left, so the main menus could be included in the image.

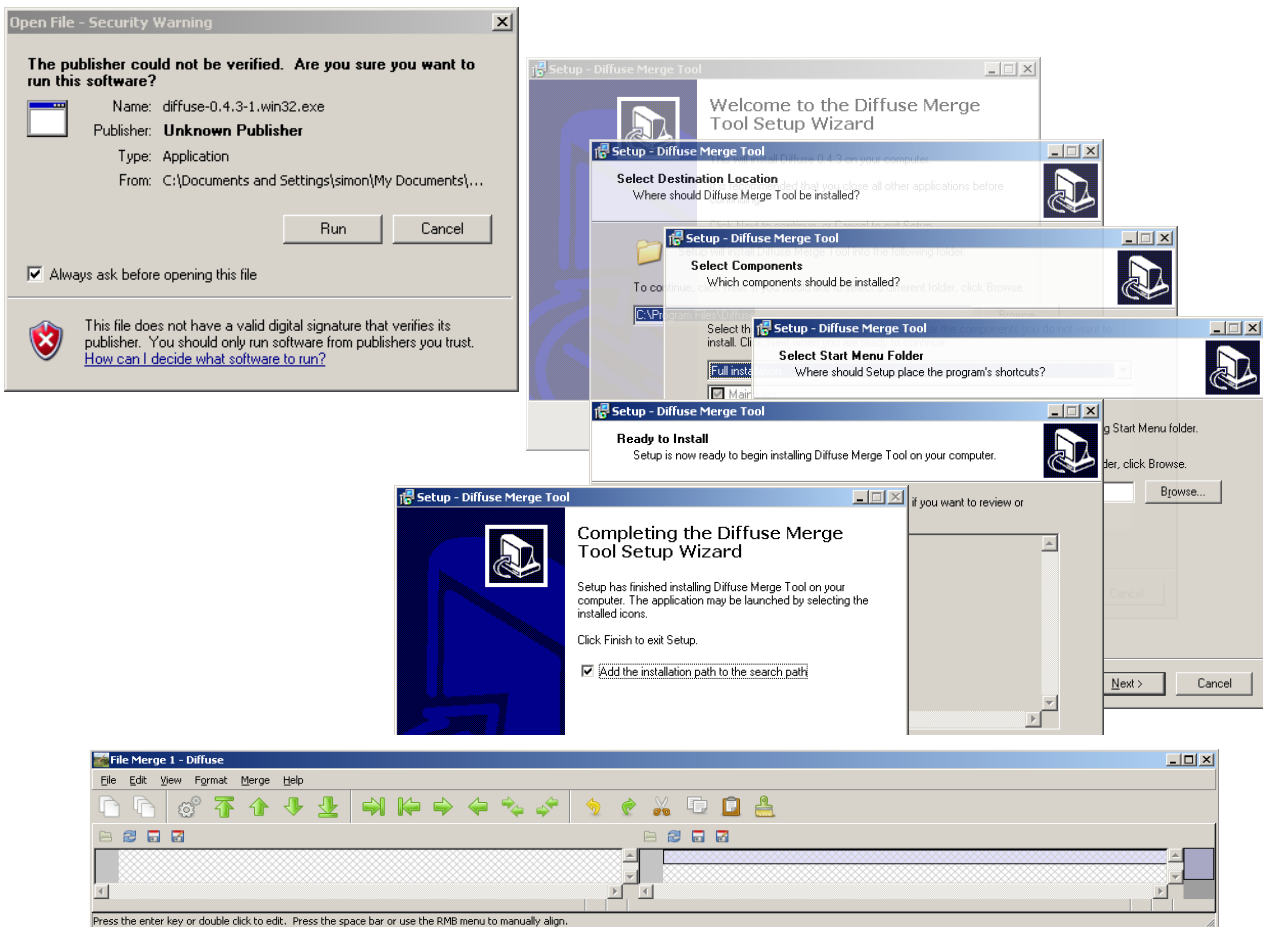


How to install gEdit onto your operating system

In Ubuntu 9.10 Karmic, gEdit can be installed using Ubuntu Software Center (link under Applications Menu).



A ready-built binary to install Diffuse on Microsoft Windows is available from the SourceForge website. Download the latest executable from the server and run.





Files responsible for defining language syntax and color



```
~/.diffuse/rst.syntax  
~/.diffuse/diffuserc
```



```
C:\Documents and Settings\{username}\.config\diffuse\rst.syntax  
C:\Documents and Settings\{username}\.config\diffuse\diffuserc.
```

The file `rst.syntax` contains both the color specifications and language patterns while `diffuserc` is a configuration file that tells Diffuse to import the `rst.syntax` specifications when the application starts. Copy the files provided in the download into the respective directories.

The file `rst.syntax` has several parts that allow you to customize how Diffuse behaves. The figure below identifies the various parts of the file and what they do.

```
rst.syntax (~/.diffuse) - gedit  
File Edit View Search Tools Documents Help  
Open Save Undo  
rst.syntax  
syntax 'reStructured Text' normal text  
syntax_files 'reStructured Text' '\.rst?$'  
  
# (c) Simon Cropper 2010  
# prepared with assistance from Derrick Moser, the developer of Diffuse  
  
|colour rst_strong 0.0 0.37 0.75  
|colour rst_emphasis 1.0 0.0 1.0  
|colour rst_literal 0.0 0.75 0.55  
|colour rst_comment 1.0 0.62 0.0  
|colour rst_phrase 0.31 0.58 0.80  
|colour rst_url 0.8 0.6 0.0  
|colour rst_underscore 1.0 0.0 0.0  
|colour rst_bullet 0.0 0.53 1.0  
|colour rst_listnum 1.0 0.62 0.0  
|colour rst_chapter 0.0 0.11 0.2  
|colour rst_section 0.0 0.37 0.75  
|colour rst_table 1.0 0.62 0.0  
|colour rst_directives 1.0 0.0 0.0  
|colour rst_block 1.0 0.0 0.0  
  
syntax_pattern normal normal rst_directives '(.. figure::|.. image::|.. _)'  
syntax_pattern normal normal rst_url 'http:[^\t\r\n]*'  
syntax_pattern normal normal rst_comment '^\.\. .+'  
  
syntax_pattern normal normal rst_underscore '_'  
  
syntax_pattern normal strong rst_strong '[*]*'  
syntax_pattern strong normal rst_strong '[*]*'  
syntax_pattern strong strong rst_strong '.'  
  
syntax_pattern normal normal rst_bullet '(^[[ ]*)([*]|[-]]{+})[ ]'  
#syntax_pattern bullet normal rst_bullet '(\r\n|\r|\n)'  
#syntax_pattern bullet bullet rst_bullet '^[^r\nh]*'
```

This tells Diffuse to use this syntax file when it sees the `rst` extension.

This defines the color used for each type of syntax pattern. See the note below regarding defining colors.

These are the syntax patterns that define when highlighting should occur. These are read from top to bottom so do not change the order of these commands as it will effect the way the syntax is rendered.

Diffuse defines a color using three values representing the red, green, blue component of the color. Essentially, rather than representing the color component as a hexadecimal or number between 0 and 255, Diffuse uses values between 0 and 1. So hexadecimal '00' is '0.0' and 'FF' is '1.0', so



magenta, which is "FF00FF" or RGB(255,0,255), is 1.0 0.0 1.0 in Diffuse.

In order to update the Color Scheme, it is only necessary find the hexadecimal code for the color, parse it in to its Red, Green and Blue component, convert each component from hexadecimal to decimal and divide by 255. HTML [Color Pickers](#) or [Color Charts](#) can be readily found on the Internet.

Once the files have been copied to the respective directories open the file `Test.rst`. The file should now have the correct syntax highlighting.

Other considerations

Comparing two version of the same file side by side

Obviously, the only value of Diffuse over gEdit is the ability to compare two versions of the same file, with syntax highlighting, side-by-side. The GUI interface and keyboard shortcuts allow you to quickly compare files. Refer to the on-line documentation of how the various toolbar and menu options work.

Notice the 'b' is has a different background because the character is different between files.

This is a graphical summary of the differences between the files

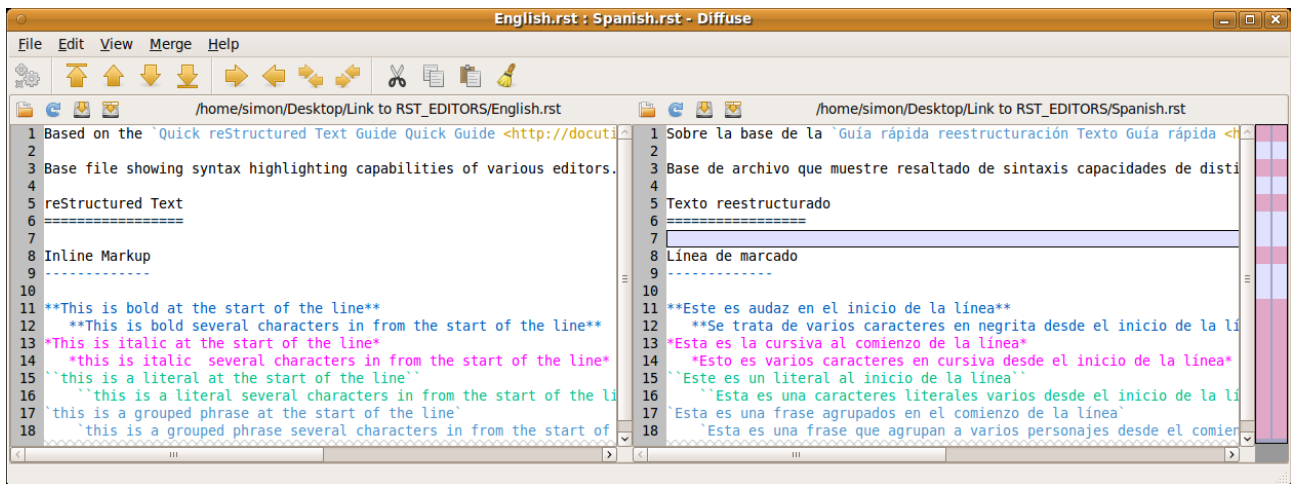
Notice the 'r' is has a different background because it is not present in the other file.

Using Diffuse to help translate files

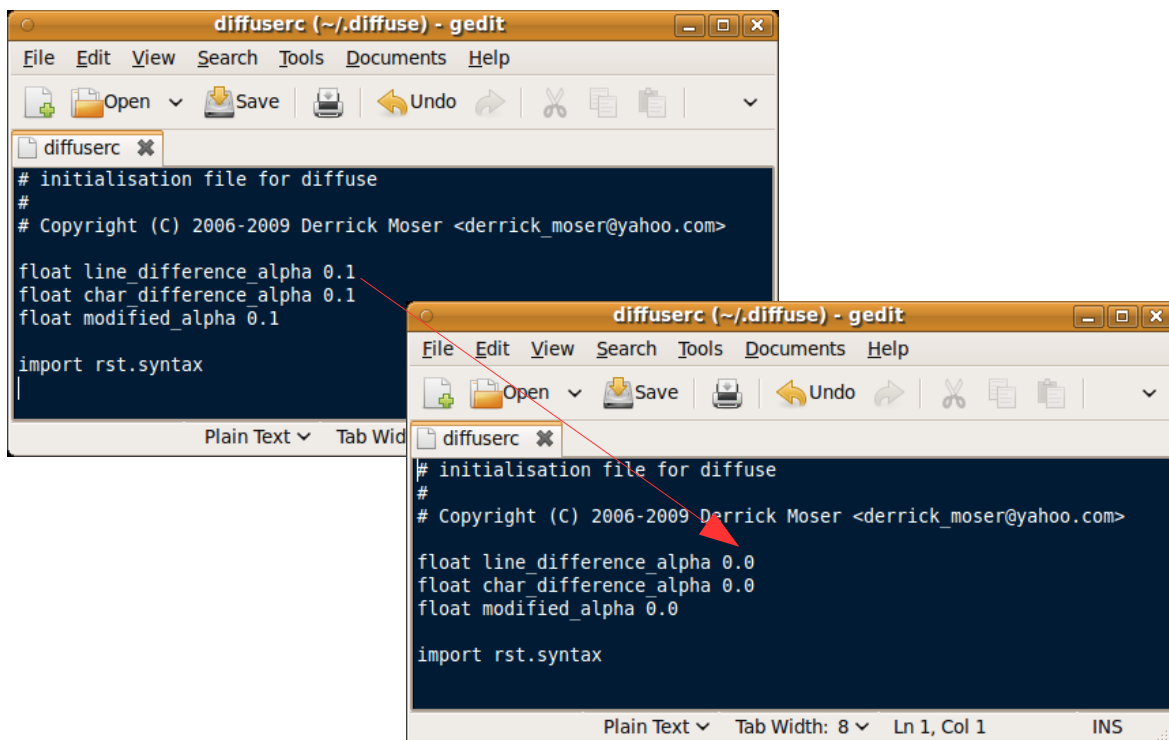
When using Diffuse with standard configuration all differences between files are highlighted by different background colors. When comparing two quite different files, like a file in English and another in Spanish, the large number of differences results in a very cluttered interface and makes reading the screen very difficult.



You can however make the background colors transparent, essentially changing Diffuse from a program that highlights textural differences between files to a side-by-side text editor with syntax highlighting.



To make the highlighting functions of diffuse become transparent it is necessary to change the 'float' values in the `diffuserc` file from '0.1' to '0.0'.



Other resources that may be of interest

- 🌟 [Python v2.6.5 documentation - Regular expression operations](#)
- 🌟 [reStructuredText Tools for Gedit on the TextMethod Website](#)
- 🌟 [reStructuredText - Markup Syntax and Parser Component of DocUtils](#)
- 🌟 [Quick reStructuredText](#)