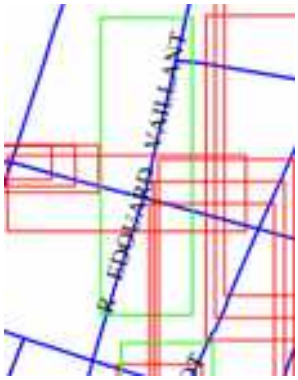
Geotools : Submission of a patch to improve rendering of line labels

The aim of the following patch is to increase the number of placed labels in constrained environment like cities with many street names.

Limitation of current code : when conflict resolution is on, many labels can't be placed because each placed label creates a large rectangle (green label bounding box) where no other label can be written.	**Proposed solution** : the improvement submitted in the patch uses **letter bounding boxes** instead of label bounding boxes. Hence, total area forbidden for other label placements is noticeably reduced.
	

Implementation : we implemented this feature as an option (but impact on the processing time is not very high and we set the option to true by default).
The patch is based on GeoTools 14-SNAPSHOT (from 2015-08-17)

Change in the gt-api library :

class **TextSymbolizer** (where vendor options are defined)
add *LETTER_CONFLICT_ENABLED_KEY (letterConflictEnabled)*
and DEFAULT_LETTER_CONFLICT_ENABLED (true)

Change in the gt-renderer library

class **LabelCacheImpl** (where the label rendering logic is implemented)
Add method
paintLineLabelsWithLetterConflict (which is partly duplicating paintLineLabels method)
Note 1 : in order to minimize the change and the performance penalty, we considered the bounding boxes of letter glyphs, not their exact geometry.
Note 2 : the change applies on line labels only. Point label and area label rendering is not changed, even in the case where labels are rotated.
Note 3 : we took a special care of white space characters which are excluded from index and will not stop a label from being placed

class **LabelCacheItem**
add letterConflictEnabled property

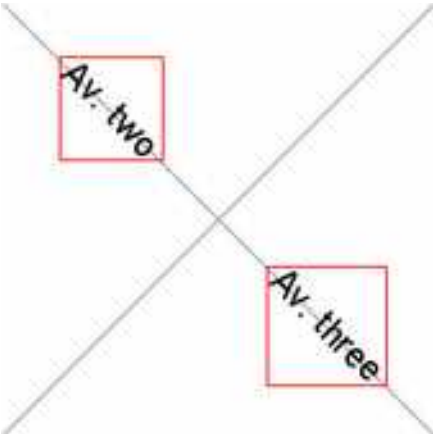
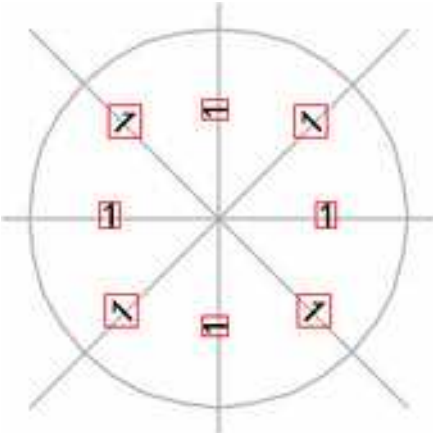
Unit-test

A few unit tests have been added in org.geotools.renderer.lite

class **LetterConflictTest** implements two tests checking that the new option enables more label placements.

Resources are in src\test\resources\org\geotools\renderer\lite\test-data

- letterConflict1.properties, letterConflict2.properties, letterConflict3.properties
- letterConflictEnabledFalse.sld, letterConflictEnabledTrue.sld

In this test, we have a label layed out on two lines and two simple labels	
LetterConflictEnabled = false « Avenue one » cannot be placed because it is in conflict with « Av. two » and « Av. three »	LetterConflictEnabled = true If we manage the conflicting areas at the letter level, all three labels can be placed, even if the main avenue label spread over two lines.
	
In the folloiwing test, one of the label is placed on a curved line	
LetterConflictEnabled = false We can't have both the circular and the radial labels displayed.	LetterConflictEnabled = true With conflicts managed at the letter level, both circular and radial labels can be placed.
	

Performance test

In **LetterConflictTest#testLetterConflictEnabledPerf** method, we tried but could not measure any performance penalty related to LetterConflictEnabled option.