

FopAndJava2D

Apache FOP and the Java2D API

This page describes FOP's design around the Java2D API.

Use cases

AWTRenderer + viewer

The `-awt` command line switch renders the pages generated by the layout engine to a Swing window. This Swing window serves as default viewer for the `-awt` switch and as an example of how to embed the AWTRenderer into a AWT/Swing application.

XSL-FO Debugger

A renderer that lets you highlight specific FO objects (box, baseline, etc) to allow you to debug your xslt-styleSheet. Much like the NET. implementation of [Altsoft](#).

PrintRenderer

The `-print` command line switch renders the pages generated by the layout engine directly to a printer. The [PrintRenderer](#) can also be used embedded in an application to print XSL-FO documents (either through the older AWT [PrintJob](#) or through the newer JPS (Java Printing System). The [PrintRenderer](#) provides a Printable implementation for that purpose.

Bitmap production

The output from the layout engine is converted to bitmap images as in Oleg Tkachenko's [TIFFRenderer](#).

PDF, PS etc. through Java2D

The above [PrintRenderer](#) can also be used to create PDFs or [PostScript](#) files by printing through JPS. The Graphics2D subclasses `PDFDocumentGraphics2D` and `PSDocumentGraphics2D` can indirectly be used for that purpose by writing a JPS [StreamPrintService](#).

(BTW this is the approach Peter West intends to take with his [Folio](#))

Package structure

- **org.apache.fop.render.java2d**: The basic renderer that renders the area tree to a Graphics2D interface.
- **org.apache.fop.render.awt**: Home of the AWTRenderer. Extends the Java2DRenderer to provide easy embeddability into AWT/Swing applications.
- **org.apache.fop.render.awt.viewer**: Example/Default viewer window that uses the AWTRenderer to display the rendered pages. Also used by the `-awt` command line switch.
- **org.apache.fop.render.print**: [PrintRenderer](#) extends the Java2DRenderer to provide printing support (Printable interface, from/to-parameters etc.). Integration with the older AWT [PrintJob](#) and the newer JPS.
- **org.apache.fop.render.bitmap**: [BitmapRenderer](#) (or [TIFFRenderer](#)) that generates multi-page bitmap images by subclassing Java2DRenderer.

That means that the `java2d` package provides the (abstract) technical foundation and the other three packages provide the concrete output paths.