Solution for bug 140321 : locale based font configuration file support

1. Overview

Besides locale, operation system and output format should be taken into consideration when configure fonts.

a. OS: different fonts are available on different OS. In order to use native fonts, user needs to specify different configuration for different OS.
b. Output format: the fonts supported by different emitters vary. For instance, CJK fonts such as “STSong-Light” are supported by PDF emitter while not supported by Postscript emitter. To use appropriate font, user can configure different fonts for different output formats.

So, to support font configuration issues thoroughly, we need to support configuration based on OS/locale/format.

2. Configuration files and priority

A font configuration file name can be following formats:

(a). format:	*fontsconfig_pdf.xml*
(b). OS + locale (language + country):	*fontsconfig_Windows_XP_zh_cn.xml*
(c). OS + locale (language):	*fontsconfig_Windows_XP_zh.xml*
(d). OS:	*fontsconfig_Windows_XP.xml*
(e). default:	*fontsconfig.xml*

From format *(a)* to format *(e)*, priority decreases. Configuration of high priority will override the one with lower priority according to overriding strategy described in following section.

3. Overriding strategy

A typical font configuration file has four type sections: `<font-paths>`, `<font-aliases>`, `<font-encoding>` and `<composite-font>`.

<font-paths>

`<font-paths>` section defines font paths where fonts are loaded. It consists of multiple `<path>` configuration item, each one define a font path. For example:

```
<font-paths>
     <path path="C:/windows/fonts"/>
```

```
        <path path="/usr/X/lib/X11/fonts/TrueType"/>
        ……
    <font-paths>
```

Overriding Strategy: the font paths of different configuration file are merged. Same paths in different configuration file will be duplicated.

Example:

fontsconfig_Windows_XP.xml defines following font paths:

```
    <font-paths>
        <path path="C:/windows/fonts"/>
        <path path="/usr/X/lib/X11/fonts/TrueType"/>
        ……
   <font-paths>
```

fontsconfig.xml defines following font paths:

```
    <font-paths>
        <path path="C:/windows/fonts"/>
        <path path="D:/windows/fonts"/>
   <font-paths>
```

The merged font paths will include three paths:

```
    "C:/windows/fonts",
    "/usr/X/lib/X11/fonts/TrueType",
    "D:/windows/fonts"
```

Notice that `"C:/windows/fonts"` which occurs in both files but only the one in *fontsconfig_Windows_XP.xml* is included because of its higher priority. The files with same canonical path are overridden.

We suggest that font paths only be configured in default configuration file, that is, *`fontsconfig.xml`*.

<font-aliases>

`<font-aliases>` section defines font aliases. It consists of `<mapping>` items, each one specify an alias name and the logical font related with the alias.

```
    <font-aliases>
      <mapping name="serif" font-family="Times-Roman"/>
   </font-aliases>
```

Above configuration specify `“serif”` as an alias of `“Times-Roman”`.

Strategy: the font aliases of different configuration file are merged. For same aliases, those aliases of higher priority override those of lower priority.

Example:

fontsconfig_Windows_XP.xml defines following font aliases:

```
<font-aliases>
  <mapping name="serif" font-family="Times-Roman"/>
  <mapping name="Arial" font-family="Helvetica"/>
</font-aliases>
```

fontsconfig.xml defines following font aliases:

```
<font-aliases>
  <mapping name="serif" font-family="Symbol"/>
  <mapping name="Courier" font-family="Courier New"/>
</font-aliases>
```

The merged aliases include three aliases:

“serif” to “Times-Roman”,

“Arial” to “Helvetica”

“Courier” to “Courier New”

Notice that “serif” occurs in both configuration file, while only the one in *fontsconfig_Windows_XP.xml* is used because of its higher priority.

<font-encodings>

<font-encodings> section defines font encoding. It consists of <encoding> items, each one specify an encoding for a font.

```
<font-encodings>
   <encoding font-family="Times-Roman" encoding="Cp1252"/>
</font-encodings >
```

Above configuration specify “Cp1252” as the encoding of “Times-Roman”.

Overriding Strategy: the font encoding of different configuration file are merged. For the encodings for same font, those encodings with higher priority override those with lower priority.

Example:

fontsconfig_Windows_XP.xml defines following font encodings:

```
<font-encodings>
   <encoding font-family="serif" encoding="Cp1252"/>
   <encoding font-family="Arial" encoding="Identity-H"/>
 </font-encodings >
```

fontsconfig.xml defines following font encodings:

```
<font-encodings>
   <encoding font-family="serif" encoding="Cp1253"/>
< encoding font-family ="Courier New" font-family="Identity-H"/>
</font-aliases>
```

The merged encodings include three encodings:

“serif” to “Cp1252”,

“Arial” to “Identity-H”,

“Courier” to “Identity-H”.

Notice that “serif” occurs in both configuration file, while only the one in *fontsconfig_Windows_XP.xml* is used because of its higher priority.

<composite-font>

The <composite-font> sections define composite fonts.

```
<composite-font name=”font1”>
    ……
</composite-font>
```

Above configuration define a composite font named “font1”.

Overriding Strategy: composite fonts of different configuration file are merged. For composite fonts with same name, the fonts with higher priority override those with lower priority.

Example:

fontsconfig_Windows_XP.xml defines following composite fonts:

```
<composite-font name=”font1”>
    ……
</composite-font>
<composite-font name=”font2”>
    ……
</composite-font>
```

fontsconfig.xml defines following font composite fonts:

```
<composite-font name=”font1”>
    ……
</composite-font>
<composite-font name=”font3”>
    ……
</composite-font>
```

The merged composite fonts include three fonts:

“font1”,
“font2”,
“font3”.

Notice that “font1” occurs in both configuration file, while only the one in *fontsconfig_Windows_XP.xml* is used because of its higher priority.