X Locale Database Specification

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X Locale Database Specification
by Yoshio Horiuchi
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Chapter 1. LocaleDB

General

An X Locale Database contains the subset of a user's environment that depends on language, in X Window System. It is made up from one or more categories. Each category consists of some classes and sub-classes.

It is provided as a plain ASCII text file, so a user can change its contents easily. It allows a user to customize the behavior of internationalized portion of Xlib without changing Xlib itself.

This document describes;

• Database Format Definition

• Contents of Database in sample implementation

Since it is hard to define the set of required information for all platforms, only the flexible database format is defined. The available entries in database are implementation dependent.

Database Format Definition

The X Locale Database contains one or more category definitions. This section describes the format of each category definition.

The category definition consists of one or more class definitions. Each class definition has a pair of class name and class value, or has several subclasses which are enclosed by the left brace ({) and the right brace (}).

Comments can be placed by using the number sign character (#). Putting the number sign character on the top of the line indicates that the entire line is comment. Also, putting any whitespace character followed by the number sign character indicates that a part of the line (from the number sign to the end of the line) is comment. A line can be continued by placing backslash (\) character as the last character on the line; this continuation character will be discarded from the input. Comment lines cannot be continued on a subsequent line using an escaped new line character.

X Locale Database only accepts XPCS, the X Portable Character Set. The reserved symbols are; the quotation mark("), the number sign (#), the semicolon(;), the backslash(\), the left brace( {) and the right brace( }).

The format of category definition is;

\[
\begin{align*}
\text{CategoryDefinition} & : = \text{CategoryHeader CategorySpec CategoryTrailer} \\
\text{CategoryHeader} & : = \text{CategoryName NL} \\
\text{CategorySpec} & : = \{ \text{ClassSpec} \} \\
\text{CategoryTrailer} & : = \"END\" \text{Delimiter CategoryName NL} \\
\text{CategoryName} & : = \text{String}
\end{align*}
\]
LocaleDB

ClassSpec ::= ClassName Delimiter ClassValue NL
ClassSpec ::= ClassValue

ClassSpec ::= ValueList | "{" NL { ClassSpec } "}"
ValueList ::= Value | Value "," ValueList
Value ::= ValuePiece | ValuePiece Value
ValuePiece ::= String | QuotedString | NumericString
String ::= Char { Char }
QuotedString ::= """ QuotedChar { QuotedChar } """
NumericString ::= \o OctDigit { OctDigit }
| \d DecDigit { DecDigit }
| \x HexDigit { HexDigit }
Char ::= <XPCS except NL, Space or unescaped reserved symbols>
QuotedChar ::= <XPCS except unescaped ""
OctDigit ::= <character in the range of "0" - "7">
DecDigit ::= <character in the range of "0" - "9">
HexDigit ::= <character in the range of "0" - "9", "a" - "f", "A" - "F">
Delimiter ::= Space { Space }
Space ::= <space> | <horizontal tab>
NL ::= <newline>

Elements separated by vertical bar (|) are alternatives. Curly braces ({...}) indicate zero or more repetitions of the enclosed elements. Square brackets ([...]) indicate that the enclosed element is optional. Quotes ("...") are used around literal characters.

The backslash, which is not the top character of the NumericString, is recognized as an escape character, so that the next one character is treated as a literal character. For example, the two-character sequence, ""\""(the backslash followed by the quotation mark) is recognized and replaced with a quotation mark character. Any whitespace character, that is not the Delimiter, unquoted and unescaped, is ignored.

Contents of Database

The available categories and classes depend on implementation, because different platform will require different information set. For example, some platform have system locale but some platform don't. Furthermore, there might be a difference in functionality even if the platform has system locale.

In current sample implementation, categories listed below are available.

XLC_FONTSET: XFontSet relative information
XLC_XLOCALE: Character classification and conversion information
XLC_FONTSET Category

The XLC_FONTSET category defines the XFontSet relative information. It contains the CHARSET_REGISTRY-CHARSET_ENCODING name and character mapping side (GL, GR, etc), and is used in Output Method (OM).

<table>
<thead>
<tr>
<th>class</th>
<th>super class</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fsN</td>
<td>fsN</td>
<td>Nth fontset (N=0,1,2, ...)</td>
</tr>
<tr>
<td>charset</td>
<td>fsN</td>
<td>list of encoding name</td>
</tr>
<tr>
<td>font</td>
<td>fsN</td>
<td>list of font encoding name</td>
</tr>
</tbody>
</table>

fsN Includes an encoding information for Nth charset, where N is the index number (0,1,2,...). If there are 4 charsets available in current locale, 4 fontsets, fs0, fs1, fs2 and fs3, should be defined. This class has two subclasses, 'charset' and 'font'.

charset Specifies an encoding information to be used internally in Xlib for this fontset. The format of value is;

```
EncodingInfo ::= EncodingName [ ":" EncodingSide ]
```

```
EncodingName ::= CHARSET_REGISTRY-CHARSET_ENCODING
```

```
EncodingSide ::= "GL" | "GR"
```

For detail definition of CHARSET_REGISTRY-CHARSET_ENCODING, refer "X Logical Font Descriptions" document.

example:
ISO8859-1:GL

font Specifies a list of encoding information which is used for searching appropriate font for this fontset. The left most entry has highest priority.

XLC_XLOCALE Category

The XLC_XLOCALE category defines character classification, conversion and other character attributes.

<table>
<thead>
<tr>
<th>class</th>
<th>super class</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>encoding_name</td>
<td></td>
<td>codeset name</td>
</tr>
<tr>
<td>mb_cur_max</td>
<td></td>
<td>MB_CUR_MAX</td>
</tr>
<tr>
<td>state_depend_encoding</td>
<td></td>
<td>state dependent or not</td>
</tr>
<tr>
<td>wc_encoding_mask</td>
<td></td>
<td>for parsing wc string</td>
</tr>
<tr>
<td>wc_shift_bits</td>
<td></td>
<td>for conversion between wc and mb</td>
</tr>
<tr>
<td>csN</td>
<td></td>
<td>Nth charset (N=0,1,2,...)</td>
</tr>
<tr>
<td>class</td>
<td>superclass</td>
<td>description</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>side</td>
<td>csN</td>
<td>mapping side (GL, etc)</td>
</tr>
<tr>
<td>length</td>
<td>csN</td>
<td>length of a character</td>
</tr>
<tr>
<td>mb_encoding</td>
<td>csN</td>
<td>for parsing mb string</td>
</tr>
<tr>
<td>wc_encoding</td>
<td>csN</td>
<td>for parsing wc string</td>
</tr>
<tr>
<td>ct_encoding</td>
<td>csN</td>
<td>list of encoding name for ct</td>
</tr>
</tbody>
</table>

**encoding_name**

Specifies a codeset name of current locale.

**mb_cur_max**

Specifies a maximum allowable number of bytes in a multi-byte character. It is corresponding to MB_CUR_MAX of "ISO/IEC 9899:1990 C Language Standard".

**state_depend_encoding**

Indicates a current locale is state dependent. The value should be specified "True" or "False".

**wc_encoding_mask**

Specifies a bit-mask for parsing wide-char string. Each wide character is applied bit-and operation with this bit-mask, then is classified into the unique charset, by using ‘wc_encoding’.

**wc_shift_bits**

Specifies a number of bit to be shifted for converting from a multi-byte character to a wide character, and vice-versa.

**csN**

Includes a character set information for Nth charset, where N is the index number (0,1,2,...). If there are 4 charsets available in current locale, cs0, cs1, cs2 and cs3 should be defined. This class has five subclasses, 'side', 'length', 'mb_encoding' 'wc_encoding' and 'ct_encoding'.

**side**

Specifies a mapping side of this charset. The format of this value is;

```
Side  ::=  EncodingSide[":Default"]
```

The suffix ":Default" can be specified. It indicates that a character belongs to the specified side is mapped to this charset in initial state.

**length**

Specifies a number of bytes of a multi-byte character of this charset. It should not contain the length of any single-shift sequence.

**mb_encoding**

Specifies a list of shift sequence for parsing multi-byte string. The format of this value is;

```
MBEncoding ::=  ShiftType ShiftSequence
|  ShiftType ShiftSequence ";"
|  MBEncoding
```
LocaleDB

ShiftType ::= "<SS>"|"<LSL>"|"<LSR>"
ShiftSequence ::= SequenceValue|SequenceValue ShiftSequence
SequenceValue ::= NumericString

eample:
<LSL> \x1b \x28 \x4a; <LSL> \x1b \x28 \x42

wc_encoding Specifies an integer value for parsing wide-char
string. It is used to determine the charset for each
wide character, after applying bit-and operation using
'wc_encoding_mask'. This value should be unique in all
csN classes.

c_t_encoding Specifies a list of encoding information that can be used
for Compound Text.

Sample of X Locale Database

The following is sample X Locale Database file.

# XLocale Database Sample for ja_JP.euc
#
#
# XLC_FONTSET category
#
XLC_FONTSET
# fs0 class (7 bit ASCII)
fs0 {
    charset    ISO8859-1:GL
    font       ISO8859-1:GL; JISX0201.1976-0:GL
}
# fs1 class (Kanji)
fs1 {
    charset    JISX0208.1983-0:GL
    font       JISX0208.1983-0:GL
}
# fs2 class (Half Kana)
fs2 {
    charset    JISX0201.1976-0:GR
    font       JISX0201.1976-0:GR
}
# fs3 class (User Defined Character)
# fs3 {
#    charset    JISX0212.1990-0:GL
#    font       JISX0212.1990-0:GL
# }
END XLC_FONTSET
# XLC_XLOCALE category

XLC_XLOCALE

encoding_name             ja.euc
mb_cur_max                3
state_depend_encoding     False

wc_encoding_mask         \x00008080
wc_shift_bits            8

cs0     {
    side                 GL:Default
    length               1
    wc_encoding          \x00000000
    ct_encoding          ISO8859-1:GL; JISX0201.1976-0:GL
}

cs1     {
    side                 GR:Default
    length               2
    wc_encoding          \x00008080
    ct_encoding          JISX0208.1983-0:GL; JISX0208.1983-0:GR;
                         JISX0208.1983-1:GL; JISX0208.1983-1:GR
}

cs2     {
    side                 GR
    length               1
    mb_encoding          <SS> \x8e
    wc_encoding          \x00000080
    ct_encoding          JISX0201.1976-0:GR
}

cs3     {
    side                 GL
    length               2
    mb_encoding          <SS> \x8f
    #if HasWChar32
    
    wc_encoding          \x20000000
    #else
    
    wc_encoding          \x00008000
    #endif
    
    ct_encoding          JISX0212.1990-0:GL; JISX0212.1990-0:GR
}
Referencing


[2] X Logical Font Descriptions