The Linux Thai HOWTO

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This document describes how to set Linux to use Thai language. This means at least, you can read and write Thai plain text document, name filename in Thai and use some applications with Thai characters. I use Linux Slackware96, the path name I describe here may be different to other distributions.

Contents

1 Introduction

My motivation comes from *ZzzThai Project* `<http://www.fedu.uec.ac.jp/ZzzThai>` by *uecthai@fedu.uec.ac.jp* `<mailto:uecthai@fedu.uec.ac.jp>`, which describe how to use Thai with many computer platforms. I joined this project, started from windows95 then I felt Linux is more interesting.

This is the early version of Thai HOWTO. It is not complete yet. The things I did not describe here, printing Thai document, Thai Tex, etc. I will try to describe them in later version.

Thai standard character codes is TIS620. Thai character codes are in the same range as iso_8859_1, so we can treat it as iso_8859_1 type. Now it seems to be iso_8859_11 standard. See *http://www.nectec.or.th/it-standards/iso8859-11* `<http://www.nectec.or.th/it-standards/iso8859-11>` about this new standard. With X11R6 there is information about Thai in `/usr/X11/include/X11/keysymdef.h` and `/usr/X11/lib/X11/locale/th_TH.TACTIS`. You may look in these directory or file for your information. For now, it is better to treat Thai character as iso_8859_1 and it works well.

Thai characters are not like Latin characters. There are many position in Thai character, normal position, character on other characters, character under other characters. There is not space in sentences. These are some problems in developing Thai word-processor.

You can find the lastest version of this HOWTO document on *http://www.fedu.uec.ac.jp/ZzzThai/Linux* `<http://www.fedu.uec.ac.jp/ZzzThai/Linux>`

2 Thai Input and Output

2.1 Linux console

2.1.1 Thai fonts

You can obtain Linux Thai console fonts which created by Khun Phaisarn Techajaruwong from

> *ftp://ftp.fedu.uec.ac.jp/pub/thai/UEC/ZzzThai/Software/Linux/Fonts*
> `<ftp://ftp.fedu.uec.ac.jp/pub/thai/UEC/ZzzThai/Software/Linux/Fonts>`

For example, there is a font name "phaisarn.psf". You can load the new font from Linux console by command

```
%setfont phaisarn.psf
```

You should put Thai fonts (psf format) in `/usr/lib/kbd/consolefonts/`. If you want Thai font to be loaded automatically when you boot the machine, create the file `/etc/rc.d/rc.font` (Slackware) as the following.

```
#!/bin/sh
#
# This selects your default screen font from among the ones in
# /usr/lib/kbd/consolefonts.
#
setfont phaisarn.psf
```

2.1.2 Keyboard layout

You can set keyboard behavior as you like by using `loadkeys` command. Usually, you use `loadkeys` to load the file located in `/usr/lib/kbd/keytables`. You can create the map file and save in this directory. This is the sample.

```
# thai.map
# This thai.map was modified by Poonlap Veeratanabutr (poon-v@fedu.uec.ac.jp)
# from us.map. Map Thai Kedmanee keyboard to US keyboard.
# 28 April 1997
# Thai/Us toggle key is AltGr(right alt).
keycode   0 =
keycode   1 = Escape           Escape
        alt     keycode   1 = Meta_Escape
keycode   2 = +one              exclam          +aring          plus
        alt     keycode   2 = Meta_one
        alt shift keycode 2 = Meta_exclam
keycode   3 = +two              at              +slash          ntilde
        control keycode   3 = nul
        control shift keycode 3 = nul
        alt     keycode   3 = Meta_two
        alt shift keycode 3 = Meta_at
keycode   4 = +three            numbersign      +underscore     ograve
        control keycode   4 = Escape
        alt     keycode   4 = Meta_three
        alt shift keycode 4 = Meta_numbersign
keycode   5 = +four             dollar          +Agrave         oacute
        control keycode   5 = Control_backslash
        alt     keycode   5 = Meta_four
        alt shift keycode 5 = Meta_dollar
keycode   6 = +five             percent         +paragraph      ocircumflex
        control keycode   6 = Control_bracketright
        alt     keycode   6 = Meta_five
        alt shift keycode 6 = Meta_percent
keycode   7 = +six              asciicircum     +Ooblique       Ugrave
        control keycode   7 = Control_asciicircum
```

```
        alt     keycode   7 = Meta_six
        alt shift keycode 7 = Meta_asciicircum
keycode   8 = +seven           ampersand      +Odiaeresis    ssharp
        control keycode   8 = Control_underscore
        alt     keycode   8 = Meta_seven
keycode   9 = +eight           asterisk       +currency      otilde
        control keycode   9 = Delete
        alt     keycode   9 = Meta_eight
keycode  10 = +nine            parenleft      +mu            Odiaeresis
        alt     keycode  10 = Meta_nine
keycode  11 = +zero            parenright     +diaeresis     division
        alt     keycode  11 = Meta_zero
keycode  12 = +minus           underscore     +cent          oslash
        control keycode  12 = Control_underscore
        control shift keycode 12 = Control_underscore
        alt     keycode  12 = Meta_minus
keycode  13 = +equal           plus           +ordfeminine   ugrave
        alt     keycode  13 = Meta_equal
keycode  14 = Delete          Delete          Delete         Delete
        alt     keycode  14 = Meta_Delete
keycode  15 = Tab             Tab             Tab            Tab
        alt     keycode  15 = Meta_Tab
keycode  16 = +q       Q       +ae            eth
keycode  17 = +w       W       +adiaeresis    quotedbl
keycode  18 = +e       E       +Oacute        registered
keycode  19 = +r       R       +threequarters plusminus
keycode  20 = +t       T       +ETH           cedilla
keycode  21 = +y       Y       +Ntilde        iacute
keycode  22 = +u       U       +Otilde        ecircumflex
keycode  23 = +i       I       +Atilde        threesuperior
keycode  24 = +o       O       +onesuperior   Idiaeresis
keycode  25 = +p       P       +Acircumflex   hyphen
keycode  26 = +bracketleft     braceleft      +masculine     degree
        control keycode  26 = Escape
        alt     keycode  26 = Meta_bracketleft
        alt shift keycode 26 = Meta_braceleft
keycode  27 = +bracketright    braceright     +Aring         comma
        control keycode  27 = Control_bracketright
        alt     keycode  27 = Meta_bracketright
        alt shift keycode 27 = Meta_braceright
keycode  28 = Return           Return         Return         Return
        alt     keycode  28 = 0x080d
keycode  29 = Control          Control        Control        Control
keycode  30 = +a       A       +questiondown  Adiaeresis
keycode  31 = +s       S       +Ediaeresis    brokenbar
keycode  32 = +d       D       +exclamdown    macron
keycode  33 = +f       F       +acute         acircumflex
keycode  34 = +g       G       +agrave        notsign
```

```
keycode  35 = +h        H       +eacute         ccedilla
keycode  36 = +j        J       +egrave         ediaeresis
keycode  37 = +k        K       +Ograve         Eacute
keycode  38 = +l        L       +Ecircumflex    Egrave
keycode  39 = +semicolon        colon           +Ccedilla       guillemotleft
        alt     keycode  39 = Meta_semicolon
keycode  40 = +apostrophe       quotedbl        +section        period
        control keycode  40 = Control_g
        alt     keycode  40 = Meta_apostrophe
keycode  41 = +grave            asciitilde      +minus          percent
        control keycode  41 = nul
        alt     keycode  41 = Meta_grave
keycode  42 = Shift            Shift            Shift           Shift
keycode  43 = +backslash        bar             +sterling       yen
        control keycode  43 = Control_backslash
        alt     keycode  43 = Meta_backslash
        alt shift keycode 43 = Meta_bar
keycode  44 = +z        Z       +onequarter     parenleft
keycode  45 = +x        X       +guillemotright parenright
keycode  46 = +c        C       +aacute         copyright
keycode  47 = +v        V       +Iacute         Icircumflex
keycode  48 = +b        B       +Ocircumflex    Uacute
keycode  49 = +n        N       +multiply       igrave
keycode  50 = +m        M       +periodcentered question
keycode  51 = +comma    less    +Aacute         twosuperior
        alt     keycode  51 = Meta_comma
        alt shift keycode 51 = Meta_less
keycode  52 = +period           greater         +atilde         Igrave
        alt     keycode  52 = Meta_period
        alt shift keycode 52 = Meta_greater
keycode  53 = +slash            question        +onehalf        AE
        control keycode  53 = Delete
        alt     keycode  53 = Meta_slash
keycode  54 = Shift            Shift            Shift           Shift
keycode  55 = KP_Multiply
keycode  56 = Alt              Alt              Alt             Alt
keycode  57 = space            space            space           space
        control keycode  57 = nul
        alt     keycode  57 = Meta_space
keycode  58 = Caps_Lock        Caps_Lock        Caps_Lock       Caps_Lock
keycode  59 = F1               F11              Console_13
        control keycode  59 = F1
        alt     keycode  59 = Console_1
        control alt     keycode  59 = Console_1
keycode  60 = F2               F12              Console_14
        control keycode  60 = F2
        alt     keycode  60 = Console_2
        control alt     keycode  60 = Console_2
```

```
keycode  61 = F3              F13              Console_15
        control keycode  61 = F3
        alt     keycode  61 = Console_3
        control alt     keycode  61 = Console_3
keycode  62 = F4              F14              Console_16
        control keycode  62 = F4
        alt     keycode  62 = Console_4
        control alt     keycode  62 = Console_4
keycode  63 = F5              F15              Console_17
        control keycode  63 = F5
        alt     keycode  63 = Console_5
        control alt     keycode  63 = Console_5
keycode  64 = F6              F16              Console_18
        control keycode  64 = F6
        alt     keycode  64 = Console_6
        control alt     keycode  64 = Console_6
keycode  65 = F7              F17              Console_19
        control keycode  65 = F7
        alt     keycode  65 = Console_7
        control alt     keycode  65 = Console_7
keycode  66 = F8              F18              Console_20
        control keycode  66 = F8
        alt     keycode  66 = Console_8
        control alt     keycode  66 = Console_8
keycode  67 = F9              F19              Console_21
        control keycode  67 = F9
        alt     keycode  67 = Console_9
        control alt     keycode  67 = Console_9
keycode  68 = F10             F20              Console_22
        control keycode  68 = F10
        alt     keycode  68 = Console_10
        control alt     keycode  68 = Console_10
keycode  69 = Num_Lock
keycode  70 = Scroll_Lock      Show_Memory      Show_Registers
        control keycode  70 = Show_State
        alt     keycode  70 = Scroll_Lock
keycode  71 = KP_7
        alt     keycode  71 = Ascii_7
keycode  72 = KP_8
        alt     keycode  72 = Ascii_8
keycode  73 = KP_9
        alt     keycode  73 = Ascii_9
keycode  74 = KP_Subtract
keycode  75 = KP_4
        alt     keycode  75 = Ascii_4
keycode  76 = KP_5
        alt     keycode  76 = Ascii_5
keycode  77 = KP_6
```

```
        alt     keycode  77 = Ascii_6
keycode  78 = KP_Add
keycode  79 = KP_1
        alt     keycode  79 = Ascii_1
keycode  80 = KP_2
        alt     keycode  80 = Ascii_2
keycode  81 = KP_3
        alt     keycode  81 = Ascii_3
keycode  82 = KP_0
        alt     keycode  82 = Ascii_0
keycode  83 = KP_Period
        altgr   control keycode  83 = Boot
        control alt     keycode  83 = Boot
keycode  84 = Last_Console
keycode  85 =
keycode  86 = less             greater          bar
        alt     keycode  86 = Meta_less
keycode  87 = F11              F11              Console_23
        control keycode  87 = F11
        alt     keycode  87 = Console_11
        control alt     keycode  87 = Console_11
keycode  88 = F12              F12              Console_24
        control keycode  88 = F12
        alt     keycode  88 = Console_12
        control alt     keycode  88 = Console_12
keycode  89 =
keycode  90 =
keycode  91 =
keycode  92 =
keycode  93 =
keycode  94 =
keycode  95 =
keycode  96 = KP_Enter
keycode  97 = Control
keycode  98 = KP_Divide
keycode  99 = Control_backslash
        control keycode  99 = Control_backslash
        alt     keycode  99 = Control_backslash
keycode 100 = AltGr_Lock
keycode 101 = Break
keycode 102 = Find
keycode 103 = Up
keycode 104 = Prior
        shift   keycode 104 = Scroll_Backward
keycode 105 = Left
        alt     keycode 105 = Decr_Console
keycode 106 = Right
        alt     keycode 106 = Incr_Console
```

```
keycode 107 = Select
keycode 108 = Down
keycode 109 = Next
        shift   keycode 109 = Scroll_Forward
keycode 110 = Insert
keycode 111 = Remove
        altgr   control keycode 111 = Boot
        control alt     keycode 111 = Boot
keycode 112 =
keycode 113 =
keycode 114 =
keycode 115 =
keycode 116 =
keycode 117 =
keycode 118 =
keycode 119 =
keycode 120 =
keycode 121 =
keycode 122 =
keycode 123 =
keycode 124 =
keycode 125 =
keycode 126 =
keycode 127 =
string F1 = "\033[[A"
string F2 = "\033[[B"
string F3 = "\033[[C"
string F4 = "\033[[D"
string F5 = "\033[[E"
string F6 = "\033[17~"
string F7 = "\033[18~"
string F8 = "\033[19~"
string F9 = "\033[20~"
string F10 = "\033[21~"
string F11 = "\033[23~"
string F12 = "\033[24~"
string F13 = "\033[25~"
string F14 = "\033[26~"
string F15 = "\033[28~"
string F16 = "\033[29~"
string F17 = "\033[31~"
string F18 = "\033[32~"
string F19 = "\033[33~"
string F20 = "\033[34~"
string Find = "\033[1~"
string Insert = "\033[2~"
string Remove = "\033[3~"
string Select = "\033[4~"
```

```
string Prior = "\033[5~"
string Next = "\033[6~"
string F21 = ""
string F22 = ""
string F23 = ""
string F24 = ""
string F25 = ""
string F26 = ""
```

Suppose you save this file as `thai.map`. To load this file

```
%loadkeys thai.map
```

To switch to Thai input press the right Alt key. If you want to switch to English press the right Alt key again. To set Thai keymap as default (Slackware), after you put `thai.map` in `/usr/lib/kbd/keytables` create the file `/etc/rc.d/rc.keymap` like the sample.

```
#!/bin/sh
#
# Loadkeys will look for thai.map in /usr/lib/kbd/keytables
#
loadkeys thai
```

The thai.map will be automatically loaded when you boot the machine.

For RedHat, change the content of the file `/etc/sysconfig/keyboard`.

2.2 X Window system

2.2.1 Thai fonts

To display Thai characters in X Window system, you must have Thai fonts for X Window system. You can obtain Thai fonts in bdf format or pcf format on internet.

ftp://ftp.fedu.uec.ac.jp/pub/thai/UEC/ZzzThai/Software/UNIX/Fonts
`<ftp://ftp.fedu.uec.ac.jp/pub/thai/UEC/ZzzThai/Software/UNIX/Fonts>`
http://thaigate.rd.nacsis.ac.jp/files/thaifonts.html
`<http://thaigate.rd.nacsis.ac.jp/files/thaifonts.html>`
http://www.nectec.ac.th/pub/software/i18n/thai
`<http://www.nectec.ac.th/pub/software/i18n/thai>`

These fonts usually come in tar or gz format. You must extract it by using command `tar` or `gunzip`. You will get a lot of `.bdf`, `.pcf` or .pcf.Z files.

Installing Thai fonts You must log in as root. Let's put Thai fonts in `/usr/X11/lib/X11/fonts/misc/` change directory to `/usr/X11/lib/X11/fonts/misc/` and run command

```
#mkfontdir
```

This command will update font database file. If you run this command in X Windows system, you may need to restart X window to take effect.

2.2.2 Thai keyboard layout

Thai keyboard layout with xmodmap You can use the utility `xmodmap` to map Thai keyboard. Normally `xmodmap` is used to load the the file. There is the file `.Xmodmap` in `/use/X11/lib/X11/xinit/`. This file will be load if you don't have ~.xinitrc/ and `.Xmodmap`(in Slackware). The file `/usr/X11/lib/X11/xinit/.Xmodmap` doesn't map all keys. It only solves the Backspace/Delete key's problem. The following is the sample `.Xmodmap` for Thai Kedmanee keyboard layout.

```
!
! Linux/XFree86 Thai Kedmanee layout (based on US keyboard)
! Generated on Mon May 26 22:59:56 1997
! by Poonlap Veeratanabutr (poon-v@fedu.uec.ac.jp)
! Use ScrollLock to switch to Thai keyboard.
! This file will work with XFree86 only.
!

keycode 0x09 =  Escape
keycode 0x43 =  F1
keycode 0x44 =  F2
keycode 0x45 =  F3
keycode 0x46 =  F4
keycode 0x47 =  F5
keycode 0x48 =  F6
keycode 0x49 =  F7
keycode 0x4A =  F8
keycode 0x4B =  F9
keycode 0x4C =  F10
keycode 0x5F =  F11
keycode 0x60 =  F12
keycode 0x6F =  Print
keycode 0x4E =  Mode_switch     XF86ModeLock
keycode 0x6E =  Pause
keycode 0x31 =  grave           asciitilde      minus           percent
keycode 0x0A =  1               exclam          aring           plus
keycode 0x0B =  2               at              slash           ntilde
keycode 0x0C =  3               numbersign      underscore      ograve
keycode 0x0D =  4               dollar          Agrave          oacute
keycode 0x0E =  5               percent         paragraph       ocircumflex
keycode 0x0F =  6               asciicircum     Ooblique        Ugrave
```

```
keycode 0x10 = 7             ampersand     Odiaeresis     ssharp
keycode 0x11 = 8             asterisk      currency       otilde
keycode 0x12 = 9             parenleft     mu             odiaeresis
keycode 0x13 = 0             parenright    diaeresis      division
keycode 0x14 = minus         underscore    cent           oslash
keycode 0x15 = equal         plus          ordfeminine    ugrave
keycode 0x33 = backslash     bar           sterling       yen
keycode 0x16 = BackSpace
keycode 0x6A = Insert
keycode 0x61 = Home
keycode 0x63 = Prior
keycode 0x4D = Num_Lock
keycode 0x70 = KP_Divide
keycode 0x3F = KP_Multiply
keycode 0x52 = KP_Subtract
keycode 0x17 = Tab
keycode 0x18 = q             Q             ae             eth
keycode 0x19 = w             W             adiaeresis     quotedbl
keycode 0x1A = e             E             Oacute         registered
keycode 0x1B = r             R             threequarters  plusminus
keycode 0x1C = t             T             ETH            cedilla
keycode 0x1D = y             Y             Ntilde         iacute
keycode 0x1E = u             U             Otilde         ecircumflex
keycode 0x1F = i             I             Atilde         threesuperior
keycode 0x20 = o             O             onesuperior    Idiaeresis
keycode 0x21 = p             P             Acircumflex    hyphen
keycode 0x22 = bracketleft   braceleft     masculine      degree
keycode 0x23 = bracketright  braceright    Aring          comma
keycode 0x24 = Return
keycode 0x6B = Delete
keycode 0x67 = End
keycode 0x69 = Next
keycode 0x4F = KP_7
keycode 0x50 = KP_8
keycode 0x51 = KP_9
keycode 0x56 = KP_Add
keycode 0x42 = Caps_Lock
keycode 0x26 = a             A             questiondown   Adiaeresis
keycode 0x27 = s             S             Ediaeresis     brokenbar
keycode 0x28 = d             D             exclamdown     macron
keycode 0x29 = f             F             acute          acircumflex
keycode 0x2A = g             G             agrave         notsign
keycode 0x2B = h             H             eacute         ccedilla
keycode 0x2C = j             J             egrave         ediaeresis
keycode 0x2D = k             K             Ograve         Eacute
keycode 0x2E = l             L             Ecircumflex    Egrave
keycode 0x2F = semicolon     colon         Ccedilla       guillemotleft
keycode 0x30 = apostrophe    quotedbl      section        period
```

```
keycode 0x53 =  KP_4
keycode 0x54 =  KP_5
keycode 0x55 =  KP_6
keycode 0x32 =  Shift_L
keycode 0x34 =  z               Z               onequarter      parenleft
keycode 0x35 =  x               X               guillemotright  parenright
keycode 0x36 =  c               C               aacute          copyright
keycode 0x37 =  v               V               Iacute          Icircumflex
keycode 0x38 =  b               B               Ocircumflex     Uacute
keycode 0x39 =  n               N               multiply        igrave
keycode 0x3A =  m               M               periodcentered  question
keycode 0x3B =  comma           less            Aacute          twosuperior
keycode 0x3C =  period          greater         atilde          Igrave
keycode 0x3D =  slash           question        onehalf         AE
keycode 0x3E =  Shift_R
keycode 0x62 =  Up
keycode 0x57 =  KP_1
keycode 0x58 =  KP_2
keycode 0x59 =  KP_3
keycode 0x6C =  KP_Enter
keycode 0x25 =  Control_L
keycode 0x40 =  Alt_L           Meta_L
keycode 0x41 =  space
keycode 0x71 =  Alt_R           Meta_R
keycode 0x6D =  Control_R
keycode 0x64 =  Left
keycode 0x68 =  Down
keycode 0x66 =  Right
keycode 0x5A =  KP_0
keycode 0x5B =  KP_Decimal

clear Shift
clear Lock
clear Control
clear Mod1
clear Mod2
clear Mod3
clear Mod4
clear Mod5

add    Shift   = Shift_L Shift_R
add    Lock    = Caps_Lock
add    Control = Control_L Control_R
add    Mod1    = Alt_L Alt_R
add    Mod2    = Mode_switch
```

Put this sample file in your home directory. If you have `.xinitrc` or `.xsession` in your home directory, add the following line in those files.

```
xmodmap ~/.Xmodmap
```

Thai/US toggle key is assigned to keycode 0x4E (78), Scroll Lock key with the statement

```
keycode 0x4E =  Mode_switch     XF86ModeLock
```

`XF86ModeLock` is the special keysym for XFree86 X server. If you don't add this keysym, you have to hold the scroll lock key while you are typing Thai characters. Note that if you use accelerated X, some keycodes are different. You may have to map keyboard by yourself. I recommend `xkeycaps` utility to config you keyboard behavior. You can get `xkeycaps` lastest version from *http://home.netscape.com/people/jwz/xkeycaps* `<http://home.netscape.com/people/jwz/xkeycaps>`. I submited the above xmodmap file to Mr.Jamie Zawinski who created `xkeycaps` so you can find above map file from `xkeycaps` too.

Note: If you are using XFree86 version 3.1.2D or later, you need to add the line `XkbDisable` in keyboard section in the `XF86Config` file. If necessary you may config the keyboard section like the example.

```
Section "Keyboard"
   Protocol        "Standard"
   AutoRepeat      500 5
   LeftAlt         Meta
   RightAlt        ModeShift
   ScrollLock      ModeLock
   RightCtl        Compose
   XkbDisable
EndSection
```

XFree86 3.1.2D or later and Thai keyboard layout. Beginning with XFree86 3.1.2D, you can use the new X11R6.1 XKEYBOARD extension to manage the keyboard layout. This is very helpful. You can set Thai keyboard layout in 2 ways. First with traditional `xmodmap`, second with XFree86 configuration.

During X server configuration with `xf86config` you will be asked about XKB, if you want to to set Thai keyboard layout for your system, say yes. There are a list of preconfigured keymaps. Choose Standard 101-key, Thai encoding.

`XF86Setup` is the graphical configuration utility for XFree86. `XF86Setup` is normally used to either perform the initial setup of the XFree86 X servers or to make adjustments to the existing configuration. It is easier than traditional `xf86config`. You can see the keyboard layout with this tool.

Ther are many choices of switch key to select. The default is Alt+RightShift switch to Thai and Alt+LeftShift switch to US. You can input Thai characters but Thai fonts are not provided.

I found that preconfigured keymaps that came with XFree86-3.2 (RedHat 4.2) is not correct. You may not be able to type THO THUNG which located at "5 key". To fix this problem, you should add the line

```
key <AE05> {        [], [   paragraph,      ocircumflex     ]       };
```

in the file `/usr/X11R6/lib/X11/xkb/symbols/th` as the example.

```
.................
    key <AE03> {        [], [       minus,      ograve          ]       };
    key <AE04> {        [], [      Agrave,      oacute          ]       };
    key <AE05> {        [], [   paragraph,      ocircumflex     ]       };
    key <AE06> {        [], [    Ooblique,      Ugrave          ]       };
    key <AE07> {        [], [  Odiaeresis,      ssharp          ]       };
.................
```

You can not type SORUSI also. Please change the line from

```
    key <AC08> {        [], [      Ograve,      eacute          ]       };
```

to

```
    key <AC08> {        [], [      Ograve,      Eacute          ]       };
```

Note that eacute is MAITHO and Eacute is SORUSI.

There are also XKB extension utilities such as **setxkbmap**, **xkbcomp**, etc. Please see man page for more information.

The following is the example. It is the part of **XF86Config** file in keyboard section. This configuration uses the default toggle key.

```
Section "Keyboard"
   Protocol        "Standard"
   AutoRepeat      500 5
   LeftAlt         Meta
   RightAlt        Meta
   ScrollLock      Compose
   RightCtl        Control
#   XkbDisable
   XkbKeycodes     "xfree86"
   XkbTypes        "default"
   XkbCompat       "default"
   XkbSymbols      "us(pc101)"
   XkbGeometry     "pc"
   XkbRules        "xfree86"
   XkbModel        "pc101"
   XkbLayout       "th"
EndSection
```

If you use XKB extension, Thai keyboard mapping with **xmodmap** may not work.

3 Applications with Thai characters

This is the tricky part. Most applications support iso_8859_1 characters or 8-bit characters. For example, emacs can display iso_8859_1 character. If we set emacs to display iso_8859_1 and use Thai font, you can edit Thai document with emacs.

You should define the environment `LC_CTYPE` to `iso_8859_1` in `/etc/profile` (for `bash` users) and `/etc/csh.cshrc` (for `tcsh` users). Similarly you should (for the sake of principle) put something like this in your `.Xdefaults` or `.Xresources` file:

```
*basicLocale:   C
*timeFormat:    C
*numeric:       C
*displayLang:   iso_8859_1
*inputLang:     iso_8859_1
```

If you use `libc-4.x.xx` you should set `LC_CTYPE` to `ISO-8859-1` instead of `iso_8859_1`.

These are some of applications which can use with Thai characters and how to config them. To make X window application displays Thai font, you should run the application with `-fn` option. For example,

```
#xterm -fn thai8x16
```

If you don't want to fill `-fn` option every time you run application. You should set Thai font in your `~/.Xdefaults` or `~/.Xresources` like this

```
XTerm*font:     NameOfThaifont
```

3.1 Non-network applications

3.1.1 xterm

There are several programs running under `xterm` such as shell, `pine`, `vi`, etc. Don't forget to use Thai font with `xterm` as I mention above.

bash :

New versions of `bash` (v1.14.1+) only need to have `LC_CTYPE` set to `iso_8859_1`, but if you have problems put the following in your `/etc/inputrc` or `~/.inputrc` file:

```
set meta-flag on
set convert-meta off
set output-meta on
```

I actually don't set `LC_CTYPE` environment variable to iso_8859_1 because this environment variable will effect other applications too. With bash shell, you can specify which environment variable to be passed to the application. I can make `tterm` (Thai Terminal) with this syntax.

```
LC_CTYPE=iso\_{}8859\_{}1 xterm -fn thai8x16
```

It is helpful if you alias the commands like this in `.bashrc`. This is a part of my `.bashrc` sample.

```
alias tterm='LC_CTYPE=iso\_{}8859\_{}1 xterm -fn thai8x16'
alias temacs='LC_CTYPE=iso\_{}8859\_{}1 emacs -fn -etl-fixed-medium-r-normal--16-160-72-72-m-80-tis620.25
alias ls='ls -F -N --color'
```

To run `xterm` with bash shell that accepts Thai characters, you just run `tterm`. You can type Thai characters in command line. That means you can name filenames in Thai.

`tcsh` :

Put the following in your `/etc/csh.cshrc` or `.tcshrc` file:

```
setenv LC_CTYPE iso_8859_1
```

Note: If this doesn't work, your copy of `tcsh` was probably not compiled with NLS support or possibly it's version 6.03 or lower.

`ls` :

Issue the command as

```
ls -N
```

or possibly

```
ls --8bit
```

You may set `alias` in `~/.bashrc` or `~/.cshrc`, so you can type `ls` without option. If you don't use `ls` with `-N` option, you may see Thai filename as ?????.

`less` :

Set the following environment variable:

```
LESSCHARSET=latin1
```

3.1.2 emacs

In version 19.26 or later of GNU emacs for X11 you can simply set the environment variable `LC_CTYPE` to `iso_8859_1`. If you use an older version or use emacs under plain Linux put the following in your `~/.emacs` or the the system-wide initialization file (probably `/usr/lib/emacs/site-lisp/default.el`):

```
(standard-display-european t)

(set-input-mode (car (current-input-mode))
        (nth 1 (current-input-mode))
        0)
```

If you run `emacs` already, press `Esc-x` and type `standard-display-european` in minibuffer, this command will tell `emacs` to display 8-bit character.

If you use bash shell you can run `emacs` in this way,

```
LC_CTYPE=iso_8859_1 emacs -fn -etl-fixed-medium-r-normal--16-160-72-72-m-80-tis620.2529-1
```

This will set `LC_CTYPE=iso_8859_1` for emacs only.

Because some Thai characters have 0 width, cursor's position may be not in the right place. you should use the fonts from `mule`. You can get these fonts from

ftp://ftp.fedu.uec.ac.jp/pub/thai/UEC/ZzzThai/Software/UNIX/Fonts/Mule/etl_fonts.tar
<ftp://ftp.fedu.uec.ac.jp/pub/thai/UEC/ZzzThai/Software/UNIX/Fonts/Mule/etl_fonts.tar>

Therefore I use the font -etl-fixed-medium-r-normal–16-160-72-72-m-80-tis620.2529-1 in an example.

3.1.3 vi

Vi should be run on `xterm` that uses Thai font.

3.1.4 xedit

Run `xedit` with `-fn` option like `xterm`. This application can display Thai characters in the right position.

3.2 Network applications

3.2.1 E-mail

You can not send Thai E-mail with `mail` command. `Mail` command transfers mail in 7 bit. You should use mail application that supports MIME such as `pine` or `elm`.

`elm`:

Put the following definitions in your `~/.elm/elmrc` file:

```
charset = iso-8859-1
displaycharset = iso-8859-1
textencoding = 8bit
```

This may not work on some versions of `elm`.

`pine` :

Put the following definition in your `~/.pinerc` file:

```
# Reflects capabilities of the display you have. Default: US-ASCII.
# Typical alternatives include ISO-8859-x, (x is a number between 1 and 9).
character-set=ISO-8859-1
```

This can also be set via the `Setup` option in `pine`. You can find it under `Config`.

3.2.2 tin

Put the following definitions in your `~/.tin/headers` file:

```
Mime-Version: 1.0
Content-Type: text/plain; charset=iso-8859-1
Content-Transfer-Encoding: 8bit
```

Now you can post messages with the proper Danish characters in the message body.

3.2.3 lynx

Put the following definition in your `~/.lynxrc` file:

```
character_set=ISO Latin 1
```

This can also be set via the `Options` menu in `lynx`. Type 'o' and set the relevant option.

3.2.4 Netscape

If you have Thai fonts in your system. You just select Thai fonts from Options | General Preferences | Fonts. Thai fonts will appear in ISO-8859-1 or in User defined. See *http://www.fedu.uec.ac.jp/ZzzThai/unix* `<http://www.fedu.uec.ac.jp/ZzzThai/unix>` for setting Thai language on Netscape.

3.3 Thai Applications on X window.

As I know. There are few Thai applications on X window.

`Likit` is the Thai editor and mail sender (by uuencode) that does not need Thai font. Likit was created by Khun Vuthichai Ampornaramveth. You can find this application from thaigate site.

If you are using Tex or Latex, you may want to use Thai Tex. This is the work of Dr. Manop Wongsaisuwan and his friends at Tokyo Institute of technology. You can also find Thai tex on *http://thaigate.nacsis.ac.jp/files/ttex.html* `<http://thaigate.nacsis.ac.jp/files/ttex.html>`.

`Txterm`, this is Thai `xterm` version. I don't know much about this.

`Xzthai`, this is the Tcl/Tk application for mapping Thai keyboard on US keyboard with graphical user interface. Also provides simple editor and keyboard layout figure. You need to have Thai font. It actually uses `xmodmap` program in background to map US keyboard and Thai keyboard. This program was created by me. See *http://www.fedu.uec.ac.jp/ZzzThai/xio/xzthai.html*
`<http://www.fedu.uec.ac.jp/ZzzThai/xio/xzthai.html>`

3.4 Other Tips.

Now you can configure the applications to be more Thai environment. Because Xt based applications allows user to configure the applications by resources. We can make the menu or label to be Thai language.

For example, if you want `xman` to display Thai labels. You may add these lines in your `.Xdefaults`

```
......
!!  Xman section
Xman*Font:                      thai8x16
Xman*helpButton.Label:          ?\`{e}\c{C}\^{A}
Xman*quitButton.Label:          \'{I}\'{I}¡
Xman*manpageButton.Label:       ?\`{U}\`{e}\'{A}×\'{I}¡\`{O}\~{A}\~{a}?\'{e}
......
```

4 References and FTP sites

4.1 Other documents of relevance

The HOWTOs ought to be available from all mirrors of `sunsite.unc.edu`.

The Linux Danish/International HOWTO by Niels Kristian Bech Jensen

The Linux Cyrillic HOWTO by Alexander L. Belikoff

The Keystroke mini-HOWTO by Zenon Fortuna.

The Locales mini-HOWTO by Peeter Joot. (This one is mainly for developers.)

The ISO-8859-1 FAQ and Programming for Internationalization FAQ (plus much more) by Michael Gschwind is available from *his homepage* <http://www.vlsivie.tuwien.ac.at/mike/i18n.html>.

NACSIS R& D Thai Project Page <http://thaigate.rd.nacsis.ac.jp> You can get information about Thai computing here.

ZzzThai Project <http://www.fedu.uec.ac.jp/ZzzThai/>, by The group of students in The University of Electro-Communications, Tokyo. Describe how to use Thai with many computer platforms.

Vuthichai's Page <http://www.ctrl.titech.ac.jp:80/ vuthi/>, contains information about Thai computing by Khun Vuthichai Ampornaramveth.

4.2 FTP and Web sites

NACSIS R & D Thai Project : *http://thaigate.rd.nacsis.ac.jp* <http://thaigate.rd.nacsis.ac.jp> You can find Thai tex on this site.

ZzzThai Project : *http://www.fedu.uec.ac.jp/ZzzThai* <http://www.fedu.uec.ac.jp/ZzzThai>

Vuthichai's Homepage : *http://www.ctrl.titech.ac.jp:80/ vuthi/* <http://www.ctrl.titech.ac.jp:80/ vuthi/>

SunSite <ftp://sunsite.unc.edu/pub/linux/> and mirrors. `doc/howto` has the above mentioned HOWTOs. `utils/nls` and subdirectories contain files related to National Language Support. Developers should take a look at `locale-tutorial-0.8.txt.gz`, `locale-pack-0.8.tar.gz` and `cat-pack.tar.gz`.

The GNU archives <ftp://prep.ai.mit.edu/pub/gnu/> has the `recode` package for character table conversion, the `ABOUT-NLS` file and the `gettext` package for locale support of some GNU applications and (of course) the latest versions of GNU emacs.

5 Acknowledgments and Copyright

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