

The Linux Thai HOWTO

Table of Contents

<u>The Linux Thai HOWTO</u>	1
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<u>1.Introduction</u>	1
<u>2.Thai Input and Output</u>	1
<u>3.Applications with Thai language</u>	1
<u>4.References and FTP sites</u>	1
<u>5.Acknowledgments and Copyright</u>	1
<u>1. Introduction</u>	2
<u>2. Thai Input and Output</u>	2
<u>2.1 Linux console</u>	2
<u>Thai fonts</u>	2
<u>Keyboard layout</u>	3
<u>2.2 X Window system</u>	7
<u>Thai fonts</u>	7
<u>Installing Thai fonts</u>	8
<u>Thai keyboard layout</u> There are two ways to map Thai keyboard on X window, using X KeyboardExtension	
<u>XKB and Thai keyboard layout</u>	8
<u>Thai keyboard layout with xmodmap</u>	9
<u>3. Applications with Thai language</u>	13
<u>3.1 Some X applications and Thai language</u>	13
<u>txterm</u>	13
<u>Emacs, Mule</u>	14
<u>vi</u>	14
<u>pine</u>	15
<u>Netscape</u>	15
<u>Ss, Simple thai word Separator</u>	15
<u>Xzthai, X keyboard configurator + simple editor</u>	15
<u>3.2 Printing Thai document</u>	16
<u>Latex and Thai language</u>	16
<u>Latex's configuration for Thai language</u>	16
<u>Use Thai LaTeX filter</u>	17
<u>Editing LaTeX source file</u>	17
<u>3.3 X Application Resources</u>	18
<u>3.4 Thai Extension for Linux (TE)</u>	18
<u>4. References and FTP sites</u>	18
<u>4.1 Other documents of relevance</u>	18
<u>4.2 Thai related stuffs</u>	19
<u>4.3 FTP and Web sites</u>	20
<u>5. Acknowledgments and Copyright</u>	20

The Linux Thai HOWTO

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This document describes how to use Thai language with Linux. This will cover setting Thai fonts, Thai keyboard and some Thai applications.

1. Introduction

2. Thai Input and Output

- [2.1 Linux console](#)
- [2.2 X Window system](#)

3. Applications with Thai language

- [3.1 Some X applications and Thai language](#)
- [3.2 Printing Thai document](#)
- [3.3 X Application Resources](#)
- [3.4 Thai Extension for Linux \(TE\)](#)

4. References and FTP sites

- [4.1 Other documents of relevance](#)
- [4.2 Thai related stuffs](#)
- [4.3 FTP and Web sites](#)

5. Acknowledgments and Copyright

[Next](#) [Previous](#) [Contents](#) [Next](#) [Previous](#) [Contents](#)

1. Introduction

It's about one year that I didn't update this document. There were a lot of movement in Thai computing and using Linux in Thailand. For example, Linux boxes are used as server in many [schools in Thailand](#).

The purpose of this document is to show how to set your Linux to use Thai language. I use Linux RedHat 5.0 as I wrote this document, so directories which I mention in this document may be different from other distribution.

First I would like to talk about Thai standard character set. Thai standard character set is TIS-620. There are also other Thai standard character sets such as ISO-IR-166, CP874, etc. Please see <http://www.inet.co.th/cyberclub/trin/thairef/> for further information about Thai standard character set. TIS-620 is 8-bit character set. It has the same range as ISO-8859-1, so we can use applications that support ISO-8859-1 character set also. Although we can use Thai language with applications that support ISO-8859-1 character set, but it does not mean those applications support Thai language.

Thai characters are different from English characters. There is a variation of position, normal position, character can be on other character, character can be under other character. There is no space between words. These are some problems in developing Thai supported application.

You can find the latest version of Thai-HOWTO document from <http://www.fedu.uec.ac.jp/ZzzThai/Linux>. Your comment is welcome.

[Next](#) [Previous](#) [Contents](#)[Next](#)[Previous](#)[Contents](#)

2. Thai Input and Output

2.1 Linux console

Thai characters do not display properly in Linux console. If you mainly use X window, you may pass this section.

Thai fonts

You can obtain Linux Thai console fonts which created by Mr. [Phaisarn Techajaruwong](#) from [ZzzThai ftp site](#)

For example, there is a font name "phaisarn.psf". Put it in `/usr/lib/kbd/consolefonts/` directory. Then, you can load the new font from Linux console by command

```
%setfont phaisarn.psf
```

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 a US/Thai keyboard-map file and save it in this directory. Here is a sample.

```

keycode 0 =
keycode 1 = Escape          Escape
alt keycode 1 = Meta_Escape
keycode 2 = +one           exclam          +0x0e5      plus
alt keycode 2 = Meta_one
alt shift keycode 2 = Meta_exclam
keycode 3 = +two           at          +slash      0x0f1
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 0x0f2
control keycode 4 = Escape
alt keycode 4 = Meta_three
alt shift keycode 4 = Meta_numbersign
keycode 5 = +four         dollar      +0x0c0      0x0f3
control keycode 5 = Control_backslash
alt keycode 5 = Meta_four
alt shift keycode 5 = Meta_dollar
keycode 6 = +five         percent     +0x0b6      0x0f4
control keycode 6 = Control_bracketright
alt keycode 6 = Meta_five
alt shift keycode 6 = Meta_percent
keycode 7 = +six          asciicircum +0x0d8      0x0d9
control keycode 7 = Control_asciicircum
alt keycode 7 = Meta_six
alt shift keycode 7 = Meta_asciicircum
keycode 8 = +seven        ampersand  +0x0d6      0x0df
control keycode 8 = Control_underscore
alt keycode 8 = Meta_seven
keycode 9 = +eight        asterisk   +0x0a4      0x0f5
control keycode 9 = Delete
alt keycode 9 = Meta_eight
keycode 10 = +nine        parenleft  +0x0b5      0x0d6
alt keycode 10 = Meta_nine
keycode 11 = +zero        parenright +0x0a8      0x0f7
alt keycode 11 = Meta_zero
keycode 12 = +minus       underscore +0x0a2      0x0f8
control keycode 12 = Control_underscore
control shift keycode 12 = Control_underscore
alt keycode 12 = Meta_minus
keycode 13 = +equal        plus       +0x0aa      0x0f9
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          +0x0e6      0x0f0
keycode 17 = +w           W          +0x0e4      quotedbl
keycode 18 = +e           E          +0x0d3      0x0ae
keycode 19 = +r           R          +0x0be      0x0b1
keycode 20 = +t           T          +0x0d0      0x0b8

```

The Linux Thai HOWTO

```

keycode 21 = +y      Y      +0x0d1      0x0ed
keycode 22 = +u      U      +0x0d5      0x0ea
keycode 23 = +i      I      +0x0c3      0x0b3
keycode 24 = +o      O      +0x0b9      0x0cf
keycode 25 = +p      P      +0x0c2      0x0ad
keycode 26 = +bracketleft braceleft +0x0ba      0x0b0
      control keycode 26 = Escape
      alt      keycode 26 = Meta_bracketleft
      alt shift keycode 26 = Meta_braceleft
keycode 27 = +bracketright braceright +0x0c5      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      +0x0bf      0x0c4
keycode 31 = +s      S      +0x0cb      0x0a6
keycode 32 = +d      D      +0x0a1      0x0af
keycode 33 = +f      F      +0x0b4      0x0e2
keycode 34 = +g      G      +0x0e0      0x0ac
keycode 35 = +h      H      +0x0e9      0x0e7
keycode 36 = +j      J      +0x0e8      0x0eb
keycode 37 = +k      K      +0x0d2      0x0c9
keycode 38 = +l      L      +0x0ca      0x0c8
keycode 39 = +semicolon colon +0x0c7      0x0ab
      alt      keycode 39 = Meta_semicolon
keycode 40 = +apostrophe quotedbl +0x0a7      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 +0x0a3      0x0a5
      control keycode 43 = Control_backslash
      alt      keycode 43 = Meta_backslash
      alt shift keycode 43 = Meta_bar
keycode 44 = +z      Z      +0x0bc      parenleft
keycode 45 = +x      X      +0x0bb      parenright
keycode 46 = +c      C      +0x0e1      0x0a9
keycode 47 = +v      V      +0x0cd      0x0ce
keycode 48 = +b      B      +0x0d4      0x0da
keycode 49 = +n      N      +0x0d7      0x0ec
keycode 50 = +m      M      +0x0b7      question
keycode 51 = +comma less +0x0c1      0x0b2
      alt      keycode 51 = Meta_comma
      alt shift keycode 51 = Meta_less
keycode 52 = +period      greater +0x0e3      0x0cc
      alt      keycode 52 = Meta_period
      alt shift keycode 52 = Meta_greater
keycode 53 = +slash      question +0x0bd      0x0c6
      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

```

The Linux Thai HOWTO

```
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
```

The Linux Thai HOWTO

```
        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`. From Linux console, use command `loadkeys` to load `thai.map`.

```
%loadkeys thai.map
```

You can switch to Thai keyboard by pressing the right Alt key. If you want to switch the keyboard back, press the right Alt key again.

2.2 X Window system

Thai fonts

You can obtain Thai fonts in bdf format or pcf format from internet. You can also use scalable fonts such as Type1 or TrueType fonts. But I will not describe about these.

Installing Thai fonts

You must log in as root. Let's put Thai fonts in `/usr/X11R6/lib/X11/fonts/misc/`, this is a default font path. Change directory to `/usr/X11R6/lib/X11/fonts/misc/` and run command

```
%mkfontdir
%xset fp rehash
```

If you put Thai fonts in different directory, you must use `xset` to add the new font path. Please see `man-page` for further information. You can check the new fonts by running command `xlsfonts` and see whether there are Thai fonts or not. If you can not see any Thai fonts from this command, you may need to restart X window.

Thai keyboard layout There are two ways to map Thai keyboard on X window, using X KeyboardExtension (XKB) and using `xmodmap`. Please select how you map Thai keyboard. I recommend using XKB.

XKB 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.

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

`XF86Setup` is the graphical X server configuration utility for XFree86 X server. It is easier than traditional `xf86config`. You can select a keyboard layout easily with this tool.

There are many choices of keyboard switch key to select. The default is LeftAlt+RightShift switch to Thai and LeftAlt+LeftShift switch to US. You can type Thai characters in any applications which support ISO-8859-1 character set, but don't forget to use Thai fonts with those applications too.

I found that pre-configured keymaps that came with XFree86-3.2 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 ] };
```

The Linux Thai HOWTO

```
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 equal to MAITHO and Eacute is equal to SORUSI.

There are also XKB extension utilities such as `setxkbmap`, `xkbcomp`, etc. Please see man-page for more information. I recommend to use `xkbvled`. The leds will be on when you are using Thai keyboard so you can know your keyboard's status.

The following is part of `XF86Config` file about keyboard section. If you want to configure the keyboard by hand, change the content of `/usr/X11R6/lib/X11/XF86Config` as an example below. 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. See `XF86Config` man-page for mor information.

Thai keyboard layout with xmodmap

You can use the utility `xmodmap` to map Thai keyboard. Normally `xmodmap` is used to load a keyboard configured file. For most Linux distributions, when you start X window with `startx`, X server will find `.Xmodmap` in `/usr/X11R6/lib/X11/xinit/` first. If `.Xmodmap` does not exist, X server will find `.Xmodmap` in your home directory. Please see the content of `/usr/X11R6/lib/X11/xinit/xinitrc`.

The Linux Thai HOWTO

The following is the sample of .Xmodmap for Thai Kedmanee keyboard layout.

```
!
! Linux/XFree86 Thai Kedmanee layout (based on US keyboard)
! 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         0x0e5          plus
keycode 0x0B = 2               at             slash          0x0f1
keycode 0x0C = 3               numbersign    underscore     0x0f2
keycode 0x0D = 4               dollar        0x0c0          0x0f3
keycode 0x0E = 5               percent       0x0b6          0x0f4
keycode 0x0F = 6               asciicircum   0x0d8          0x0d9
keycode 0x10 = 7               ampersand     0x0d6          0x0df
keycode 0x11 = 8               asterisk      0x0a4          0x0f5
keycode 0x12 = 9               parenleft     0x0b5          0x0f6
keycode 0x13 = 0               parenright    0x0a8          0x0f7
keycode 0x14 = minus           underscore     0x0a2          0x0f8
keycode 0x15 = equal           plus          0x0aa          0x0f9
keycode 0x33 = backslash       bar           0x0a3          0x0a5
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             0x0e6          0x0f0
keycode 0x19 = w               W             0x0e4          quoteddbl
keycode 0x1A = e               E             0x0d3          0x0ae
keycode 0x1B = r               R             0x0be          0x0b1
keycode 0x1C = t               T             0x0d0          0x0b8
keycode 0x1D = y               Y             0x0d1          0x0ed
keycode 0x1E = u               U             0x0d5          0x0ea
keycode 0x1F = i               I             0x0c3          0x0b3
keycode 0x20 = o               O             0x0b9          0x0cf
keycode 0x21 = p               P             0x0c2          0x0ad
keycode 0x22 = bracketleft     braceleft     0x0ba          0x0b0
keycode 0x23 = bracketright    braceright    0x0c5          comma
```

The Linux Thai HOWTO

```
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           0x0bf         0x0c4
keycode 0x27 = s           S           0x0cb         0c0a6
keycode 0x28 = d           D           0x0a1         0x0af
keycode 0x29 = f           F           0x0b4         0x0e2
keycode 0x2A = g           G           0x0e0         0x0ac
keycode 0x2B = h           H           0x0e9         0x0e7
keycode 0x2C = j           J           0x0e8         0x0eb
keycode 0x2D = k           K           0x0d2         0x0c9
keycode 0x2E = l           L           0x0ca         0x0c8
keycode 0x2F = semicolon   colon      0x0c7         0x0ab
keycode 0x30 = apostrophe  quotedbl  0x0a7         period
keycode 0x53 = KP_4
keycode 0x54 = KP_5
keycode 0x55 = KP_6
keycode 0x32 = Shift_L
keycode 0x34 = z           Z           0x0bc         parenleft
keycode 0x35 = x           X           0x0bb         parenright
keycode 0x36 = c           C           0x0e1         0x0a9
keycode 0x37 = v           V           0x0cd         0x0ce
keycode 0x38 = b           B           0x0d4         0x0da
keycode 0x39 = n           N           0x0d7         0x0ec
keycode 0x3A = m           M           0x0b7         question
keycode 0x3B = comma       less       0x0c1         0x0b2
keycode 0x3C = period      greater    0x0e3         0x0cc
keycode 0x3D = slash       question   0x0bd         0x0c6
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
```

The Linux Thai HOWTO

```
add    Control = Control_L Control_R
add    Mod1     = Alt_L  Alt_R
add    Mod2     = Mode_switch
```

Just put `.Xmodmap` in your home directory will be OK. When you start X window, X server will load this file.

You can also load `.Xmodmap` from command line.

```
%xmodmap ~/.Xmodmap
```

In above `.Xmodmap` file, US/Thai switch 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 commercial X server, some keycodes are different. You may have to map keyboard by yourself. See man-pages of X and `xev` for further information.

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

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

[NextPreviousContentsNextPreviousContents](#)

3. Applications with Thai language

This is the tricky part. Most applications support ISO-8859-1 character set. 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. But this is not a good policy. You should avoid using this trick as possible. What we need is Thai locale or Thai supported applications to manage these things.

To make X window application displays Thai font, you should run the application with `-fn` option. For example,

```
%xedit -fn thai8x16
```

Note that `thai8x16` is just a one of Thai font names. You can see all available fonts by command `xlfonts`. 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:      thai8x16
```

3.1 Some X applications and Thai language

txterm

`txterm` is Thai version of `xterm`. There are several programs running under `xterm` such as `shell`, `pine`, `vi`, `less`, etc. We can type Thai characters without any problems with `txterm`. `txterm` also provides its own Thai input method by pressing " F1 " key. `txterm` will use fonts `thai9x13` as default Thai font. You can change this by add `-fn` option.

You can get `txterm` from [Thaigate](#) or [ZzzThai](#).

bash shell:

Normally, shell accepts only ASCII character set. To type Thai characters in shell command line, you should set environment `LC_CTYPE` to `iso_8859_1`.

I 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. For example, I can make a fake Thai X terminal with this syntax.

```
LC_CTYPE=iso_8859_1 xterm -fn thai8x16
```

This `xterm` display Thai characters well, but not good for typing Thai characters. I strongly recommend you to use `txterm`.

ls :

If you name a filename in Thai. Issue the command as

```
ls -N
```

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 `?????`.

Emacs, Mule

Mule stands for " Multilingual Enhancement to GNU Emacs ". It has the same functions as emacs and supports many languages. Mule provides its own input method, so you don't need any configuration for typing Thai. You needs only Thai fonts for mule which you can get from, [ZzzThai](#) or [Etl site](#). These Thai fonts are fixed width fonts.

You need some configuration for mule. Puts the following lines in your `.emacs`.

```
;;  
;; Thai System, add in .emacs  
;;  
(set-file-coding-system-for-read '*tis620*)  
(set-default-file-coding-system '*tis620*)  
(set-display-coding-system '*tis620*)  
(set-keyboard-coding-system '*tis620*)  
(setq-default quail-current-package (assoc "thai" quail-package-alist))
```

Add the following lines in `.Xdefaults`.

```
!  
! Emacs, Mule - Font menu  
!  
Emacs*FontSetList: thai14, thai16, thai24  
Emacs*FontSet-thai14:\br/>    -etl-fixed-medium-r-normal--14-140-72-72-m-70-tis620.2529-1  
Emacs*FontSet-thai16:\br/>    -etl-fixed-medium-r-normal--16-160-72-72-m-80-tis620.2529-1  
Emacs*FontSet-thai24:\br/>    -etl-fixed-medium-r-normal--24-500-72-72-m-120-tis620.2529-1
```

When you hold shift key and press left mouse's button, you can select Thai fonts to display in mule window. To type Thai characters, press " `Ctrl +]` ". To type English, press " `Ctrl +]` " again.

You can get mule from [ElectroTechnical Laboratory\(ETL\)](#)

vi

Vi should be run on `tterm`.

pine

In the past, we could not send 8-bit characters through E-mail. Now, although mail transfer agent can handle 8-bit characters but some old mail transfer agent can not. We can send Thai e-mail by using e-mail application that supports MIME (Multipurpose Internet Mail Extensions) E-mail applications that support MIME are pine, elm, Netscape mail, etc.

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

```
character-set=ISO-8859-1
```

This can also be set via the `Setup` option in pine window. You can find it under `Config`. You can read Thai news from pine, too.

Pine should be run in `tterm`.

Netscape

If you have Thai fonts in your system. Just set Thai font from preference. Thai fonts will appear in User defined area. See <http://www.fedu.uec.ac.jp/ZzzThai/unix> for setting Thai language on Netscape.

Some movement about Thai Mozilla project at <http://members.xoom.com/inThai/mozthai.html>.

Ss, Simple thai word Separator

`ss` is a dictionary based Thai word separation program similar to `cttex`. It can be used to insert a configurable string between Thai words. It can also show words that cannot be found in the dictionary. More words can be added to the dictionary. Developed by Mr.Teera Kittichareonpot.

We can use this program to insert `< WBR >` tag between Thai words in html file. Browser will display Thai homepage better than normal html document.

Xzthai, X keyboard configurator + simple editor

`xzthai`, this is the Tcl/Tk application for mapping Thai keyboard on any keyboard with graphical user interface. Also provides simple editor and keyboard layout figure. It actually uses `xmodmap` program in background to map Thai keyboard. This may be useful for commercial X server and X server on UNIX.

3.2 Printing Thai document

Thai2ps is used to convert plain text file to postscript file. You can use ghostscript(gs) to print your Thai document. For better quality document, you have to use (La)TeX.

Latex and Thai language

Dr. Manop Wongsaisuwan first tried to use Thai language with latex. He wrote some perl script as filter for latex source code that contains Thai language. Then pass the result to latex. Mr. Vuthichai Ampornaramvech used this concept and wrote a program in C language, cttex, to handle this. It runs faster and makes Thai word segmentation based on dictionary. Cttex also fixes the position of Thai characters in word, so SARA and WANNAYUK will be placed in the beautiful position.

You can find Thai latex filter from <http://thaigate.nacsis.ac.jp/files/ttex.html>.

Latex's configuration for Thai language

You must have latex installed in your computer. First, download Thai postscript (Type1) fonts, tfm fonts and Thai style file. These fonts are needed by Latex. This is the list of files you should download.

```
tfm fonts:
    dbtt.tfm    dbttb.tfm    dbttbi.tfm  dbtti.tfm
postscript fonts:
    dbtt.pfa    dbttb.pfa    dbttbi.pfa  dbtti.pfa
style files:
    thai.sty sakka.sty
Thai Latex filter:
    cttex
Sample Latex file:
    ttex.ttex test.ttex
```

There is latex's directory at /usr/lib/texmf/texmf/ (RedHat 5.0). I will call /usr/lib/texmf/texmf/ as "\$texroot". We will concentrate at \$texroot/texmf/ directory. In \$texroot/texmf/ directory, there are many files about tex's configuration. You have to edit files in dvips, fonts, tex subdirectories.

Add the following lines to \$texroot/texmf/dvips/misc/psfonts.map

```
dbtt  DBThaiText <dbtt.pfa
dbttb DBThaiTextBold <dbttb.pfa
dbttbi DBThaiTextBoldItalic <dbttbi.pfa
dbtti DBThaiTextItalic <dbtti.pfa
```

Make a new directories and copy files to the appropriate directories.

The Linux Thai HOWTO

```
%mkdir /usr/lib/texmf/texmf/fonts/tfm/public/thai
%mkdir /usr/lib/texmf/texmf/fonts/typel/public/thai
%mkdir /usr/lib/texmf/texmf/tex/generic/thai
%cp *.tfm /usr/lib/texmf/texmf/fonts/tfm/public/thai
%cp *.pfa /usr/lib/texmf/texmf/fonts/typel/public/thai
%cp *.sty /usr/lib/texmf/texmf/tex/generic/thai
```

Run `texhash` or `MakeTeXls-R`(in some system) to update Tex database.

```
%/usr/bin/texhash
texhash: updating /usr/lib/texmf/texmf/ls-R ...
texhash: Done.
```

Use Thai LaTeX filter

We can use `cttex` as filter like this,

```
%cttex < ttex.tttx > ttex.tex
C-TTeX $Revision: 1.15 $
Usage : cttex [cutcode] < infile > outfile
Usage : cutcode=0 forces operation in HTML mode.
Build-in dictionary size: 9945 words
 343
Done
%latex ttex.tex
...
%xdvi ttex.dvi
```

You can convert dvi file to postscript file by,

```
%dvips -o ttex.ps ttex.dvi
```

Finally, you can print `ttex.ps` by using `gs` or `lpr`. You must configure printer before printing. See man-pages of `printcap`, `gs`, `lpr` for more information.

Editing LaTeX source file

For new latex user, `lyx` is helpful. But I recommend to use `mule` to edit Thai latex source file because `mule` supports Thai language and it is a powerful editor. You may take a look a [Thai Latex tutorial](#).

3.3 X Application Resources

Because Xt based applications allow 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:    ^àÇÃ
Xman*quitButton.Label:    íí|
Xman*manpageButton.Label:  ¢ÛèÁ×í; òÃã^é
.....
```

You can use the same idea to set window manager to be more Thai environment too.

3.4 Thai Extension for Linux (TE)

Thai Extension for Linux is a installation package comes with applications and Thai fonts. You don't have to configure Linux system and applications by yourself. Let TE do configuration task for you. After installation, you can use Thai language suddenly. Get TE from <ftp://fedu.uec.ac.jp/pub/thai/UEC/ZzzThai/Software/Linux/>

[NextPreviousContentsNextPreviousContents](#)

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](#).

4.2 Thai related stuffs

" NACSIS R& D Thai Project Page " , <http://thaigate.nacsis.ac.jp>

- Information about Thai computing.
- Discussion groups in Thai language, such as thai-l (Thai Mailing list), Thai news, etc.
- Thai references and Thai softwares.
- Thai Latex filter.

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

- Most softwares and Thai fonts introduced here can download from ZzzThai.
- Describe how to use Thai with 3 main computer platforms, UNIX like, Windows and Mac.
- Linux information at <http://www.fedu.uec.ac.jp/ZzzThai/Linux>, TE, Thai LaTeX tutorial, etc.
- By The group of students at The University of Electro-Communications, Tokyo.

" Vuthichai's Page " , <http://www.ctrl.titech.ac.jp:80/~vuthi/>

- Information about Thai computing by Mr. Vuthichai Ampornaramveth.

" An annotated reference to the Thai implementations " , <http://www.inet.co.th/cyberclub/trin/thairef/>

- Information about Thai character standard.
- By Mr. Trin Tantsetthi.

" X window and Thai language " , <http://members.xoom.com.cwg.x11th/>

- By Mr. Rawat S. Pirom

" SchoolNet Internet Sever " , <http://www.school.net.th/linux-sis/>

- Using Linux in School, Thailand.
- By [NECTEC](#) (National Electronics and Computer Technology Center).

" Thai Open Source Development " , <http://members.xoom.com/inThai>

- Mozilla Thai enabling.
- Open source Thai softwares and Libraries.
- By Mr. Samphan Raruenrom

" Linux Thai Project " , <http://www.geocities.com/SiliconValley/8302>

- Information about Linux in Thai language.
- By Kaiwal Development Team.

" ThaiLinux unofficial Webboard " , <http://lulu.mptc.eng.cmu.ac.th/HyperNews/get/ThaiLinux.html>

- Questions and answers about Linux in Thai language.
- By Mr.Pruet Boonma

" Thai Linux installation project " , <http://www.geocities.com/Tokyo/Bay/4521/>

- Installation guide in Thai language

4.3 FTP and Web sites

Most softwares and Thai fonts which introduced in this howto.

- <ftp://ftp.fedu.uec.ac.jp/pub/thai/UEC/ZzzThai/Software/Linux>
- <http://thaigate.nacsis.ac.jp/files/index.html>
- <http://www.nectec.or.th/pub/software/i18n/thai>

Mule

- <ftp://etlport.etl.go.jp/pub/mule>

Ss

- <http://members.xoom.com/theera/ss/>

[SunSite](#) 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](#) 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.

[NextPreviousContents](#) Next [PreviousContents](#)

5. Acknowledgments and Copyright

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The Linux Thai HOWTO

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Next [PreviousContents](#)