

# Oracle Applications Keyboard Mapping For Sun Workstations With Type 4 or Type 5 Keyboards

*An AppsDBA Consulting White Paper*

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# Oracle Applications Keyboard Mapping For Sun Workstations

## 1. Overview

This information is supplied to allow the use of a Sun workstation with a Type 4 or Type 5 keyboard running Openwindows to access character mode Oracle Applications. This is done by modifying the xterm keyboard settings to send vt100 key codes rather than xterm keycodes. It is expected that the emulation will be run using an xterm window. All of the required key mappings are supplied so that Oracle Applications can be successfully used.

## 2. Modify The .Xdefaults File

The actual key mappings should be added to the .Xdefaults file. The default file is located in the /usr/openwin/lib directory and is called Xdefaults. A custom file may already exist in the user's \$HOME directory and will be called .Xdefaults (e.g. a ls -la will show .files). If a .Xdefaults does not exist then the /usr/openwin/lib/Xdefaults file should be copied to the user's \$HOME directory and named .Xdefaults (e.g. cp /usr/openwin/lib/Xdefaults ~/.Xdefaults). The following lines should then be added to the .Xdefaults file:

### Type 4 Keyboard:

```
XTerm*vt100.translations:      #override \  
    !Shift <Key>R1:            keymap(vt100)  
XTerm*vt100Keymap.translations: #override \  
    <Key>R4:                    string(0x1B) string("OP") \n\  
    <Key>R5:                    string(0x1B) string("OQ") \n\  
    <Key>R6:                    string(0x1B) string("OR") \n\  
    <Key>F3:                    string(0x1B) string("OA") \n\  
    <Key>F4:                    string(0x1B) string("OB") \n\  
    <Key>F5:                    string(0x1B) string("OD") \n\  
    <Key>F6:                    string(0x1B) string("OC") \n\  
    <Key>KP_Subtract:          string(0x1B) string("OS") \n\  
    Shift<Key>KP_2:           string(0x1B) string("B") \n\  
    Shift<Key>KP_4:           string(0x1B) string("D") \n\  
    Shift<Key>KP_6:           string(0x1B) string("C") \n\  
    Shift<Key>KP_8:           string(0x1B) string("A") \n\  
    <Key>KP_0:                 string(0x1B) string("Op") \n\  
    <Key>KP_1:                 string(0x1B) string("Oq") \n\  
    <Key>KP_2:                 string(0x1B) string("Or") \n\  
    <Key>KP_3:                 string(0x1B) string("Os") \n\  
    <Key>KP_4:                 string(0x1B) string("Ot") \n\  
    <Key>KP_5:                 string(0x1B) string("Ou") \n\  
    <Key>KP_6:                 string(0x1B) string("Ov") \n\  
    <Key>KP_7:                 string(0x1B) string("Ow") \n\  
    <Key>KP_8:                 string(0x1B) string("Ox") \n\  
    <Key>KP_9:                 string(0x1B) string("Oy") \n\  
    <Key>KP_Decimal:          string(0x1B) string("On") \n\  
    <Key>KP_Add:               string(0x1B) string("Ol") \n\  
    <Key>R2:                   string(0x1B) string("Om") \n\  
    <Key>KP_Enter:            string(0x1B) string("OM") \n\  
    !Shift <Key>R1:            keymap(None)
```

### Type 5 Keyboard:

```
XTerm*VT100*Translations:      #override \  
    @Num_Lock<Key>F5:         string(0x1B) string("[28~") \n\  
    @Num_Lock<Key>F6:         string(0x1B) string("[29~") \n\  
    @Num_Lock<Key>F1:         string(0x1B) string("OP") \n\  
    @Num_Lock<Key>F2:         string(0x1B) string("OQ") \n\  
    @Num_Lock<Key>F3:         string(0x1B) string("OR") \n\  
    @Num_Lock<Key>F4:         string(0x1B) string("OS") \n\  
    @Num_Lock<Key>F8:         string(0x1B) string("[1~") \n\  

```

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```
@Num_Lock<Key>F9: string(0x1B) string("[2~") \n\  
@Num_Lock<Key>F10: string(0x1B) string("[4~") \n\  
@Num_Lock<Key>F11: string(0x1B) string("[5~") \n\  
@Num_Lock<Key>F12: string(0x1B) string("[6~") \n
```

## 3. Modify The .xinitrc File

For a Type 4 keyboard no lines should have to be added to the .xinitrc file. For a Type 5 keyboard normally just two lines need to be added to the .xinitrc file:

```
xmodmap -e 'keycode 16 = F11'  
xmodmap -e 'keycode 18 = F12'
```

For both Type 4 and Type 5 keyboards if there is no xrdp command to load the local .Xdefaults file then the following if statement should also be added:

```
if [ -f $HOME/.Xdefaults ]; then  
    xrdp $HOME/.Xdefaults          # Load Users X11 resource database  
else  
    xrdp $OPENWINHOME/lib/Xdefaults # Load Default X11 resource database  
fi
```

## 4. Using The New Key Mappings

Type 4 keyboard:

Pressing Shift-R1 again returns the normal keypad.

Type 5 Keyboard:

The vt100 key codes are enabled by turning on the Num Lock key. Once the above changes have been made you will need to start a new xterm session. The key codes can be tested by toggling the Num Lock key and typing one of the re-mapped keys. The codes output should change depending on the Num Lock key setting.

## 5. Type 5 Keyboard Key Map

```
F1 - PF1  
F2 - PF2  
F3 - PF3  
F4 - PF4  
F5 - Help  
F6 - Do (Save)  
F7 -  
F8 - Find  
F9 - Insert/Replace  
F10 - Select (QuickPick)  
F11 - Next  
F12 - Prev
```

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## 6. Appendix A - Type 4 Keyboard Sample Files

### 6.1 .xinitrc

```
# .xinitrc - OpenWindows startup script.
xmodmap -e 'keycode 16 = F11'
xmodmap -e 'keycode 18 = F12'
if [ -f $HOME/.Xdefaults ]; then
    xrdb $HOME/.Xdefaults          # Load Users X11 resource database
else
    xrdb $OPENWINHOME/lib/Xdefaults # Load Default X11 resource database
fi
# xrdb -merge /home/CDROM/XCdplayer.ad
xhost sun1 > /dev/null 2>&1

$OPENWINHOME/lib/openwin-sys      # OpenWindows system initialization

# SunView binary compatibility is default mode.
[ -z "$NOSUNVIEW" -o "$NOSUNVIEW" -ne 1 ] && eval `svenv -env`

sleep 15 & pid=$!                  # OpenLook Window Manager
olwmm -syncpid $pid &
# olwm -syncpid $pid &
wait $pid                          # Pause until olwm inits
xset fp rehash > /dev/null 2>&1
if [ -x $HOME/.openwin-init ]; then
    $HOME/.openwin-init            # Custom OpenWindows tools
else
    $OPENWINHOME/lib/openwin-init  # Default OpenWindows tools
fi

wait                                # Wait for olwm (key client) to exit
```

### 6.2 .Xdefaults

```
Emacs*font:                        9x15
OpenWindows.AutoRaise:             false
OpenWindows.Beep:                  always
OpenWindows.PopupJumpCursor:       True
OpenWindows.DragRightDistance:      100
OpenWindows.MultiClickTimeout:      4
OpenWindows.Use3DFrames:            true
OpenWindows.XMeter.titlebar:        off
OpenWindows.XClock.titlebar:        off
OpenWindows.XClock.borderWidth:     0
OpenWindows.MinimalDecor:           xclock
OpenWindows.WorkspaceColor:         #2d5be5
OpenWindows.WindowColor:           #cccccc
OpenWindows.IconLocation:           bottom
OpenWindows.SelectDisplaysMenu:     False
OpenWindows.SetInput:               followmouse
OpenWindows.ScrollbarPlacement:     left
Scrollbar.JumpCursor:               True
*ttyModes:                          erase ^? intr ^C kill ^U start ^Q stop ^S swtch ^@
*basicLocale:                        C
*displayLang:                        C
```

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```
*inputLang: C
*numeric: C
*timeFormat: C
hpTerm*term0.geometry: 83x40
hpTerm*Term0.geometry: 83x40
hpTerm*backgroundIsSelect: True
hpTerm*makeColors: shadow
hpTerm*scrollBar: True
XTerm*SimpleMenu*menuLabel.font: -adobe-helvetica-bold-r-normal--*-
120-*--*--*--iso8859-*
XTerm*SimpleMenu*menuLabel.vertSpace: 100
XTerm*SimpleMenu*Sme.height: 16
XTerm*SimpleMenu*BackingStore: NotUseful
XTerm*SimpleMenu*HorizontalMargins: 16
XTerm*SimpleMenu*Cursor: left_ptr
XTerm*mainMenu*interrupt*Label: Send INT Signal
XTerm*mainMenu*logging*Label: Log to File
XTerm*mainMenu*quit*Label: Quit
XTerm*mainMenu*hangup*Label: Send HUP Signal
XTerm*mainMenu*redraw*Label: Redraw Window
XTerm*mainMenu*terminate*Label: Send TERM Signal
XTerm*mainMenu*securekbd*Label: Secure Keyboard
XTerm*mainMenu*suspend*Label: Send STOP Signal
XTerm*mainMenu*continue*Label: Send CONT Signal
XTerm*mainMenu*allowsends*Label: Allow SendEvents
XTerm*mainMenu*kill*Label: Send KILL Signal
XTerm*mainMenu.Label: Main Options
XTerm*vtMenu*allow132*Label: Allow 80/132 Column Switching
XTerm*vtMenu*reversevideo*Label: Enable Reverse Video
XTerm*vtMenu*tekshow*Label: Show Tek Window
XTerm*vtMenu*cursesemul*Label: Enable Curses Emulation
XTerm*vtMenu*autowrap*Label: Enable Auto Wraparound
XTerm*vtMenu*tekmode*Label: Switch to Tek Mode
XTerm*vtMenu*visualbell*Label: Enable Visual Bell
XTerm*vtMenu*reversewrap*Label: Enable Reverse Wraparound
XTerm*vtMenu*vthide*Label: Hide VT Window
XTerm*vtMenu*marginbell*Label: Enable Margin Bell
XTerm*vtMenu*autolinefeed*Label: Enable Auto Linefeed
XTerm*vtMenu*altscreen*Label: Show Alternate Screen
XTerm*vtMenu*appcursor*Label: Enable Application Cursor Keys
XTerm*vtMenu*softreset*Label: Do Soft Reset
XTerm*vtMenu*appkeypad*Label: Enable Application Keypad
XTerm*vtMenu*hardreset*Label: Do Full Reset
XTerm*vtMenu*scrollbar*Label: Enable Scrollbar
XTerm*vtMenu*scrollkey*Label: Scroll to Bottom on Key Press
XTerm*vtMenu*scrollttyoutput*Label: Scroll to Bottom on Tty Output
XTerm*vtMenu*jumpscroll*Label: Enable Jump Scroll
XTerm*vtMenu*clearsavedlines*Label: Reset and Clear Saved Lines
XTerm*vtMenu.Label: VT Options
XTerm*tek4014*fontLarge: 9x15
XTerm*tek4014*font2: 8x13
XTerm*tek4014*font3: 6x13
XTerm*tek4014*fontSmall: 6x10
XTerm*VT100*font5: 9x15
XTerm*VT100*font2: 6x10
XTerm*VT100*font3: 7x13
XTerm*VT100*font1: 5x8
XTerm*VT100*font6: nil2
XTerm*VT100*font4: 10x20
XTerm*VT100.geometry: 80x24
```

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```
XTerm*VT100*Translations:      #override \  
  @Num_Lock<Key>F5:  string(0x1B) string("[28~") \n\  
  @Num_Lock<Key>F6:  string(0x1B) string("[29~") \n\  
  @Num_Lock<Key>F1:  string(0x1B) string("OP") \n\  
  @Num_Lock<Key>F2:  string(0x1B) string("OQ") \n\  
  @Num_Lock<Key>F3:  string(0x1B) string("OR") \n\  
  @Num_Lock<Key>F4:  string(0x1B) string("OS") \n\  
  @Num_Lock<Key>F8:  string(0x1B) string("[1~") \n\  
  @Num_Lock<Key>F9:  string(0x1B) string("[2~") \n\  
  @Num_Lock<Key>F10: string(0x1B) string("[4~") \n\  
  @Num_Lock<Key>F11: string(0x1B) string("[5~") \n\  
  @Num_Lock<Key>F12: string(0x1B) string("[6~") \  
XTerm*tekMenu*tekreset*Label:  RESET  
XTerm*tekMenu*tektext2*Label:  #2 Size Characters  
XTerm*tekMenu*tekhide*Label:   Hide Tek Window  
XTerm*tekMenu*tekcopy*Label:   COPY  
XTerm*tekMenu*tektext3*Label:  #3 Size Characters  
XTerm*tekMenu*vtshow*Label:    Show VT Window  
XTerm*tekMenu*tektextsmall*Label: Small Characters  
XTerm*tekMenu*vtmode*Label:    Switch to VT Mode  
XTerm*tekMenu*tektextlarge*Label: Large Characters  
XTerm*tekMenu*tekpage*Label:   PAGE  
XTerm*tekMenu.Label:           Tek Options  
XTerm*fontMenu*fontescape*Label: Escape Sequence  
XTerm*fontMenu*fontdefault*Label: Default  
XTerm*fontMenu*font2*Label:    Small  
XTerm*fontMenu*fontsel*Label:  Selection  
XTerm*fontMenu*font6*Label:    Unreadable  
XTerm*fontMenu*font3*Label:    Medium  
XTerm*fontMenu*font5*Label:    Large  
XTerm*fontMenu*font4*Label:    Huge  
XTerm*fontMenu*font1*Label:    Tiny  
XTerm*fontMenu.Label:          VT Fonts  
XTerm*sunFunctionKeys:         True  
XTerm*Boldfont:                9x15bold  
XTerm*ScrollBar:               True  
/*  
XTerm*background:               dark slate blue  
*/  
XTerm*font:                      9x15  
XTerm*boldFont:                 9x15bold  
XTerm*allowSendEvents:          true  
/*  
XTerm*foreground:               yellow  
*/  
XTerm*normaltextfont:           10x20  
XTerm*cursorColor:              cyan2  
*XmText*FontList:  -*prestige-medium-r-normal-*120-  
HPterm*Term0.geometry:         83x40  
HPterm*Term0.font:              9x15  
*XmTextField*FontList:  -*prestige-medium-r-normal-*120-*
```

## 7. Appendix B - Type 5 Keyboard Sample Files

### 7.1 .xinitrc

```
# .xinitrc - OpenWindows startup script.
```

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```
xmodmap -e 'keycode 16 = F11'
xmodmap -e 'keycode 18 = F12'
if [ -f $HOME/.Xdefaults ]; then
    xrdb $HOME/.Xdefaults          # Load Users X11 resource database
else
    xrdb $OPENWINHOME/lib/Xdefaults # Load Default X11 resource database
fi
# xrdb -merge /home/CDROM/XCdplayer.ad
xhost sun1 > /dev/null 2>&1

$OPENWINHOME/lib/openwin-sys      # OpenWindows system initialization

# SunView binary compatibility is default mode.
[ -z "$NOSUNVIEW" -o "$NOSUNVIEW" -ne 1 ] && eval `svenv -env`

sleep 15 & pid=$!                  # OpenLook Window Manager
olvwm -syncpid $pid &
# olwm -syncpid $pid &
wait $pid                          # Pause until olwm inits
xset fp rehash > /dev/null 2>&1
if [ -x $HOME/.openwin-init ]; then
    $HOME/.openwin-init            # Custom OpenWindows tools
else
    $OPENWINHOME/lib/openwin-init  # Default OpenWindows tools
fi

wait                                # Wait for olwm (key client) to exit
```

## 7.2 .Xdefaults

```
Emacs*font:                        9x15
OpenWindows.AutoRaise:             false
OpenWindows.Beep:                  always
OpenWindows.PopupJumpCursor:       True
OpenWindows.DragRightDistance:      100
OpenWindows.MultiClickTimeout:      4
OpenWindows.Use3DFrames:            true
OpenWindows.XMeter.titlebar:        off
OpenWindows.XClock.titlebar:        off
OpenWindows.XClock.borderWidth:    0
OpenWindows.MinimalDecor:           xclock
OpenWindows.WorkspaceColor:         #2d5be5
OpenWindows.WindowColor:            #cccccc
OpenWindows.IconLocation:           bottom
OpenWindows.SelectDisplaysMenu:     False
OpenWindows.SetInput:               followmouse
OpenWindows.ScrollbarPlacement:     left
Scrollbar.JumpCursor:               True
*ttyModes:                          erase ^? intr ^C kill ^U start ^Q stop ^S swtch ^@
*basicLocale:                       C
*displayLang:                        C
*inputLang:                          C
*numeric:                            C
*timeFormat:                         C
hpterm*term0.geometry:              83x40
hpterm*Term0.geometry:              83x40
hpterm*backgroundIsSelect:          True
hpterm*makeColors:                  shadow
```

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```
hpterm*scrollBar: True
XTerm*SimpleMenu*menuLabel.font: -adobe-helvetica-bold-r-normal--*-
120-***--iso8859-*
XTerm*SimpleMenu*menuLabel.vertSpace: 100
XTerm*SimpleMenu*Sme.height: 16
XTerm*SimpleMenu*BackingStore: NotUseful
XTerm*SimpleMenu*HorizontalMargins: 16
XTerm*SimpleMenu*Cursor: left_ptr
XTerm*mainMenu*interrupt*Label: Send INT Signal
XTerm*mainMenu*logging*Label: Log to File
XTerm*mainMenu*quit*Label: Quit
XTerm*mainMenu*hangup*Label: Send HUP Signal
XTerm*mainMenu*redraw*Label: Redraw Window
XTerm*mainMenu*terminate*Label: Send TERM Signal
XTerm*mainMenu*securekbd*Label: Secure Keyboard
XTerm*mainMenu*suspend*Label: Send STOP Signal
XTerm*mainMenu*continue*Label: Send CONT Signal
XTerm*mainMenu*allowsends*Label: Allow SendEvents
XTerm*mainMenu*kill*Label: Send KILL Signal
XTerm*mainMenu.Label: Main Options
XTerm*vtMenu*allow132*Label: Allow 80/132 Column Switching
XTerm*vtMenu*reversevideo*Label: Enable Reverse Video
XTerm*vtMenu*tekshow*Label: Show Tek Window
XTerm*vtMenu*cursesemul*Label: Enable Curses Emulation
XTerm*vtMenu*autowrap*Label: Enable Auto Wraparound
XTerm*vtMenu*tekmode*Label: Switch to Tek Mode
XTerm*vtMenu*visualbell*Label: Enable Visual Bell
XTerm*vtMenu*reversewrap*Label: Enable Reverse Wraparound
XTerm*vtMenu*vthide*Label: Hide VT Window
XTerm*vtMenu*marginbell*Label: Enable Margin Bell
XTerm*vtMenu*autolinefeed*Label: Enable Auto Linefeed
XTerm*vtMenu*altscreen*Label: Show Alternate Screen
XTerm*vtMenu*appcursor*Label: Enable Application Cursor Keys
XTerm*vtMenu*softreset*Label: Do Soft Reset
XTerm*vtMenu*appkeypad*Label: Enable Application Keypad
XTerm*vtMenu*hardreset*Label: Do Full Reset
XTerm*vtMenu*scrollbar*Label: Enable Scrollbar
XTerm*vtMenu*scrollkey*Label: Scroll to Bottom on Key Press
XTerm*vtMenu*scrollttyoutput*Label: Scroll to Bottom on Tty Output
XTerm*vtMenu*jumpscroll*Label: Enable Jump Scroll
XTerm*vtMenu*clearsavedlines*Label: Reset and Clear Saved Lines
XTerm*vtMenu.Label: VT Options
XTerm*tek4014*fontLarge: 9x15
XTerm*tek4014*font2: 8x13
XTerm*tek4014*font3: 6x13
XTerm*tek4014*fontSmall: 6x10
XTerm*VT100*font5: 9x15
XTerm*VT100*font2: 6x10
XTerm*VT100*font3: 7x13
XTerm*VT100*font1: 5x8
XTerm*VT100*font6: nil2
XTerm*VT100*font4: 10x20
XTerm*VT100.geometry: 80x24
XTerm*VT100*Translations: #override \
    @Num_Lock<Key>F5: string(0x1B) string("[28~") \n\
    @Num_Lock<Key>F6: string(0x1B) string("[29~") \n\
    @Num_Lock<Key>F1: string(0x1B) string("OP") \n\
    @Num_Lock<Key>F2: string(0x1B) string("OQ") \n\
    @Num_Lock<Key>F3: string(0x1B) string("OR") \n\
    @Num_Lock<Key>F4: string(0x1B) string("OS") \n\
```

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```

@Num_Lock<Key>F8:  string(0x1B)  string("[1~") \n\
@Num_Lock<Key>F9:  string(0x1B)  string("[2~") \n\
@Num_Lock<Key>F10: string(0x1B)  string("[4~") \n\
@Num_Lock<Key>F11: string(0x1B)  string("[5~") \n\
@Num_Lock<Key>F12: string(0x1B)  string("[6~") \n
XTerm*tekMenu*tekreset*Label:  RESET
XTerm*tekMenu*tektext2*Label:  #2 Size Characters
XTerm*tekMenu*tekhide*Label:  Hide Tek Window
XTerm*tekMenu*tekcopy*Label:  COPY
XTerm*tekMenu*tektext3*Label:  #3 Size Characters
XTerm*tekMenu*vtshow*Label:  Show VT Window
XTerm*tekMenu*tektextsmall*Label:  Small Characters
XTerm*tekMenu*vtmode*Label:  Switch to VT Mode
XTerm*tekMenu*tektextlarge*Label:  Large Characters
XTerm*tekMenu*tekpage*Label:  PAGE
XTerm*tekMenu.Label:  Tek Options
XTerm*fontMenu*fontescape*Label:  Escape Sequence
XTerm*fontMenu*fontdefault*Label:  Default
XTerm*fontMenu*font2*Label:  Small
XTerm*fontMenu*fontsel*Label:  Selection
XTerm*fontMenu*font6*Label:  Unreadable
XTerm*fontMenu*font3*Label:  Medium
XTerm*fontMenu*font5*Label:  Large
XTerm*fontMenu*font4*Label:  Huge
XTerm*fontMenu*font1*Label:  Tiny
XTerm*fontMenu.Label:  VT Fonts
XTerm*sunFunctionKeys:  True
XTerm*Boldfont:  9x15bold
XTerm*ScrollBar:  True
/*
XTerm*background:  dark slate blue
*/
XTerm*font:  9x15
XTerm*boldFont:  9x15bold
XTerm*allowSendEvents:  true
/*
XTerm*foreground:  yellow
*/
XTerm*normaltextfont:  10x20
XTerm*cursorColor:  cyan2
*XmText*FontList:  *-prestige-medium-r-normal-*-120-*
HPterm*Term0.geometry:  83x40
HPterm*Term0.font:  9x15
*XmTextField*FontList:  *-prestige-medium-r-normal-*-120-*

```

## 8. Appendix C - Key Mapping Codes

The following are the VT220 key codes that map to Oracle Applications character mode applications using a CRT file called VT220GL. The first column is the function in Oracle Applications. For example commit maps to \ScreenSave. The second column is what the key is called on a VT220 keyboard, and the third column is the actual character code.

OA Mapping	VT220 Mapping	Key Code (Character)
PF2	PF2	ESC OQ
PF4	PF4	ESC OS
Help	Help	ESC [28~
Save	Do	ESC [29~

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Query Run	Find	ESC [1~
Insert/Replace	Ins	ESC [2~
QuickPick	Select	ESC [4~
ZonePrior	Prev	ESC [5~
ZoneNext	Next	ESC [6~

## 9. References

This document was originally inspired by a copy of an email message from Michael J. Miller around May of 1992.

## 10. About The Author

Andrew Rivenes has been an Oracle DBA working with Oracle Applications since 1992. He has worked for Oracle Corporation as a Principal Consultant specializing in Oracle Applications technical architecture and currently is available through AppsDBA Consulting. Mr. Rivenes has presented several talks/papers at various Oracle user groups and also maintains an Oracle Applications DBA web site at [www.appsdba.com](http://www.appsdba.com) and can be reached at [arivenes@appsdba.com](mailto:arivenes@appsdba.com).