REAL TIME OPERATING SYSTEM PROGRAMMING-II: Windows CE, OSEK and Real time Linux

Lesson-2:

Windows and Windows CE Programming

1. Windows Programming

Windows Programming

- Window class an instance of which defines a Window (object).
- Basic coordinates *x* and *y*, and *z*-parameter.
- *z* — specifies whether window is over and below other windows
- Specification for visibility (show or hide or no activate).
- Specification for parent-child hierarchy.

Windows procedures

- Share the attributes, for example, Commandshow.
- Respond to the requests

Windows Controls

- Windows Controls– functions of command, menu, toolbar bars

Notifications to Windows

- Windows based application program (API) is written to respond or activate on changes from the current state on pushing of notification (s) from the OS.
- OS monitors all input sources (for example, stylus tap, virtual (on touch screen) or physical key press).

Notifications to Windows

- A notification occurs on an event
- All notifications are sent to the Windows
- A notification sends the *message* to a API
- Messages are placed in queue for the Windows APIs

Examples of OS Notifications to Windows

- The OS notifies that a key has been pressed or a button has been clicked or command has been received for redrawing the Windows screen.
- Differs from Unix, where it is other way round. The application program asks for the input(s) from the OS for a character or commands or inputs from the keyboard.

Windows Programming

- Win32 APIs
- Windows uses handle in many procedures (functions)
- Handle─ a reference to an interface, for example for a Window, file or thread or port. [An interface is an unimplemented procedure (function or method) the codes for which are defined in the class, which uses that interface.]

Windows Handle

- Handle example is INSTANCE of a Window.
- INSTANCE is an object, which is used as a Handle
- Handle is also used as a pointer, called option pointer.
- The option pointer is pointer which points to a pointer of one of the several sets of the codes, which run on selecting the option

Windows Handle Inheritance

- Windows support (WCE does not) Handle inheritance
- Handle inheritance─ a Handle can be extended to create a new Handle, which inherits the variables, properties and procedures of parent handle and adds, overrides and overloads new variables, properties and procedures

2. Windows CE Programming

Windows CE Programming

- Use of Win32 APIs subset only [for example, no environment related functions and environment blocks, no current directory information at the subset]

Windows CE Programming…

- Support small screen system Windows
- Support touch screen system Windows
- Support no hard-disk, low RAM memory and use of ROM and flash memory in the system
- Support System -processor— x86 or ARM or SuperH, or any other
- Support Unicode 16-bit unsigned *short* characters

Windows CE Windows controls

- Reduced number of Windows controls compared to personal computer
- New format Windows controls (functions of command, menu, toolbar bars provided in one line due to small screen),

Windows CE Windows controls…

- New controls (for example, date and time picker controls, calendar picker control, edit control to auto capitalize first character of a word when keying in and virtual keyboard) and a organizer (for example, task-to-do)

Windows CE Programming

- WCE device drivers imported as the DLLs at runtime
- WCE does not support Handle inheritance and certain security attributes.
- Support to Componentization

Windows CE.NET Programming…

- A runtime environment converts the byte code instructions into the native machine and platform instruction
- Bytes code─ can run on different platforms and be distributed.

Summary

We learnt

- A Windows based application program is written to respond or activate or changes from the current state on pushing of notification(s) from the OS.
- A notification occurs on an event.
- The notification sends the *message* to the Windows application program.
- Messages are placed in queue for the Windows of application program.

We learnt

- Win32 API subset is used for GUIs programming.
- WCE supports the ISRs which pass the messages to ISTs, which run as lower priority threads than the ISRs and ISTs run as priority queue of threads.
- Windows uses handle in many procedures (functions). WCE does not support inheritance of Handles

We learnt

- Subset of Win32 APIs
- Windows based application program (API) written to respond or activate on changes from the current state on pushing of notification (s) from the OS.
- OS monitors all input sources (for example, stylus tap, virtual (on touch screen) or physical key press).

We learnt

- New Windows Controls
- New format and reduced number of Windows controls
- No support to Handle Inheritance and certain security attributes
- Windows for Small screen , touch screen system
- No hard-disk, low RAM memory and use of ROM and flash memory in the system

End of Lesson-2 of chapter 10 on

Windows and Windows CE Programming