Changes from Version 2.5 to Version 2.6

Overview

This note describes the changes made to InterViews since the release of Version 2.5 in May 1989. The major changes in 2.6 are: cfront 2.0 compatibility; integration of GNU C++ 1.36.2, including support for the DECstation 3100; a new Menu class with subclasses for pulldown and popup menus; StringBrowser, FileBrowser, StringChooser, and FileChooser classes for browsing and selecting from lists of strings or file names; a simple class browser (iclass); and discontinuation of the structured text library (libtext), the X10 version of libInterViews, and iwm (old window manager).

The new Menu class and subclasses are a significant improvement over the 2.5 Menu class they replace; however, code that uses 2.5 menus must be modified to take advantage of the new classes. The 2.6 menu classes support popups, pulldowns, and pullrights, and we felt it would be too confusing to retain the old Menu class, which handled only popups.

The structured text library, X10 libInterViews, and iwm application are obsolete, and we can no longer maintain them. We believe the 2.5 source for these components will work with the 2.6 distribution, but we have not tested them. Because MIT will distribute the twm window manager with X11R4, the InterViews distribution no longer includes a version of twm. The version of twm distributed with InterViews 2.5 is compatible with 2.6 applications.

g++ 1.36.2

Version 2.6 includes a copy of g++ 1.36.2 with modifications to support the Mips architecture in general and the DECstation 3100 in particular. 2.6 also works with both AT&T cfront 1.2 and 2.0. Future InterViews distributions will not be compatible with the C++ 1.2 language definition.

Because none of the InterViews code uses libg++ (the GNU C++ library), an application written with InterViews and compiled with g++ (or cfront) is not considered to be derived from GNU software. Thus there continues to be no licensing restrictions on InterViews-based applications.

To allow usage in different compilation environments, InterViews includes a compiler driver (CC command), static object analyzer (nmunch), and library support for initialization (_main, exit). See the release notes for information on using a local C++ compiler command.

Destructors and class Resource

As we compiled InterViews with cfront 2.0, we discovered that it is not legal C++ to use “delete” to decrement the reference count of a resource object. The 2.0 translator changes an object’s vtbl pointer along the destructor chain, thus making it unsafe to continue to use the object. In 2.6, it is therefore necessary to use the global function Unref to delete a resource.

Menus

The new Menu class is a subclass of another new class, Control. A control is a monoscene that allows an action to be selected and executed. Controls use ControlStates, subjects that coordinate a group of related controls. A menu contains a scene of other controls, called the menu’s *body*. When a menu is opened, it inserts the body into the world with a drop shadow. The appearance of the menu and its body are defined by two other interactors. For example, a pulldown menu in a menu bar might use a message to display the string “File”; when the pulldown menu is opened, it inserts a composition of menu items such as “Save” and “Quit” that defines its body. MenuItem is a subclass of Control that defines the leaves of a menu hierarchy. Normally, an application will provide a subclass of MenuItem that implements the Do virtual function to carry out the user's intent.

PopupMenu, PulldownMenu, and PullrightMenu are subclasses of Menu that implement common menu styles. MenuBar is a subclass of HBox that manages the control state associated with a set of menus. PopupMenu has no appearance; it inserts its body into the world in response to an input event. PulldownMenu and PullrightMenu open the menu body below and to the right of the menu, respectively. These classes allow you to use menus in an application without creating or passing control states explicitly.

StringBrowser, StringChooser, FileBrowser, and FileChooser

StringBrowser is an interactor that provides a browsing and selection interface to a list of strings. StringBrowsers are often used in dialog boxes to let the user browse and select from an unbounded set of textual entries.

StringChooser is a dialog that manages keyboard focus between a StringBrowser and a StringEditor to provide a convenient interface to selecting strings. The user can select strings either by selecting them in the StringBrowser or by typing them in the StringEditor. Like Dialog, StringChooser is an abstract class; programmers must derive from StringChooser to add push buttons, etc. and to compose them into custom arrangements.

FileBrowser is a StringBrowser that displays file names. In addition to the standard StringBrowser constructor parameters, the FileBrowser constructor takes a directory name as an argument. The FileBrowser scans the corresponding directory, appending the file names to its list of strings.

FileChooser is a StringChooser that provides a complete dialog box interface to selecting a file name. The interface consists of two lines of descriptive text, a StringEditor for entering the file name explicitly, a FileBrowser, and two PushButtons, one for accepting and one for canceling the dialog.

Other new features

Interactor
: The Interactor class has two new member functions: GetCanvas returns the Interactor's canvas, and Highlight(boolean) tells an interactor to turn highlighting on or off if the parameter is true or false, respectively. Scenes implement Highlight by calling it recursively on their components.

MarginFrame
: A new frame subclass, MarginFrame, surrounds its component with horizontal and vertical glue of specified sizes.

Scroller
: The scroller behavior is now identical for all three buttons: they all replicate the original behavior of the middle button. Also, Scroller no longer sets its cursor.

Event
: We have added two new events, FocusInEvent and FocusOutEvent, to support focus events correctly. EnterEvent and LeaveEvent specify pointer motion into or out of an interactor. OnEvent and OffEvent are obsolete, but for backward compatibility they are equivalent to EnterEvent and LeaveEvent.

Message
: The Message class now supports an optional argument that specifies an amount of white space to leave around the text. This feature is useful for items in menus.

Rubberband
: Several new rubberband subclasses have been added for additional kinds of interactive feedback, including ScalingLine, ScalingLineList, RotatingLineList, and SlidingEllipse.

StringEditor, TextEditor, TextDisplay
: These classes now support horizontal scrolling. Also, StringEditor uses a more flexible strategy to decide when to return input control to the caller. TextEditor implements grab scrolling (scroll in response to mouse motion) and rate scrolling (scroll by amount corresponding to the differential between the current and initial mouse positions, creating a joystick-like interface).

Transformer

Boolean functions such as Scaled now take an optional floating point tolerance for comparing matrix values with a constant such as zero or one. New member functions have been added to transform and inverse-transform a rectangle.

Alignment and boolean types

The Alignment and boolean types are now **unsigned** instead of enumerations. This change was necessary to allow bitfields of these types under C++ 2.0.

Applications

CC

We have parameterized the CC command so that the same executable can invoke cfront 1.2, cfront 2.0, or g++ via a run-time switch. We have also added run-time library support for C++ static objects to let applications work in any compilation environment.

genclass

The genclass command has been reimplemented as a script, and we have renamed it "mkclass" to avoid conflicting with the genclass command used by libg++.

idraw

The drawing editor now provides a FileChooser dialog for opening files and navigating through directories. Other new features include more intuitive landscape mode behavior, a more accurate grid, and an enhanced Reshape tool that supports editing transformed text in place.

iclass

Iclass is a simple class browser that lets the user traverse C++ class hierarchies and view the definition of a particular class.

ifb

Ifb displays a sample string in a font that is specified by font family, style, and size. Ifb writes the full X font name of the chosen font to standard output when it exits.

ifc

Ifc is an interactive file chooser that lets the user browse through directories and select a file name.

logo

Logo simply displays the InterViews logo (or any bitmap) in rainbow colors.

Configuration management

To simplify the file organization, the *config*, *doc*, and *man* subdirectories have been moved under *src*, and the *bin* and *lib* subdirectories have been moved under *installed*. We use X11R4 imake, so you will need our version of imake or the X11R4 version; the X11R3 version will not work.