Developing Cross-platform applications with Firebird and wxWidgets

Introduction

About myself

Been using Firebird since
first beta versions came out.

Manager of FlameRobin project and
author of FBExport and FBCopy tools

Desktop applications market

* Microsoft Windows dominate

* Other platforms getting popular

    * Linux

    * Mac OS X

    * Less important: Solaris, FreeBSD

    * Cross-plaform: works on most of those

Programming languages

* Java + Jaybird: AWT, Swing

* Python + kinterbasdb: PyQt, PyGtk, wxPython

  * execution speed

  * memory requirements

  * runs fine on modern hardware

  * price (free)

* Delphi & Lazarus

C++

* Compilers
  * freeware, open source, commercial
  * leaders: GNU GCC & MSVC
  * others: Borland, Intel, Apple, D.Mars,...
* Toolkits
  * Qt   (KDE, dual licenced)
  * Gtk+   (Gnome, Qt vs Gtk comparison)
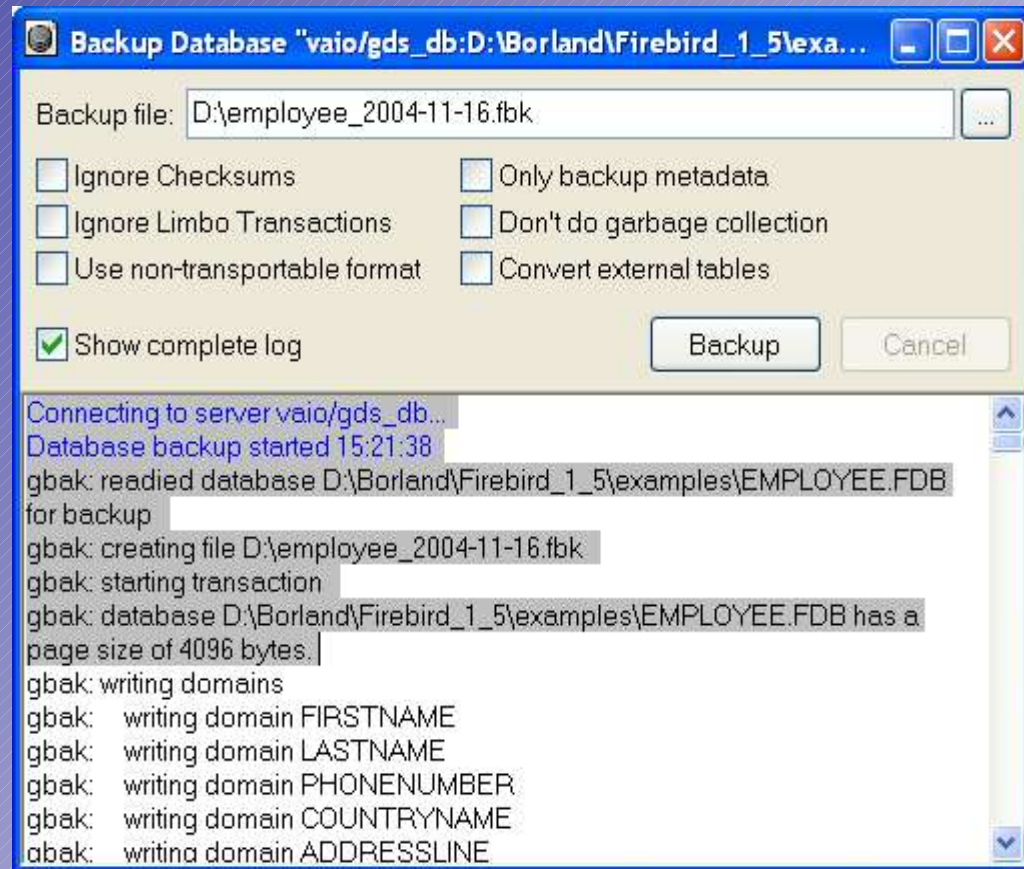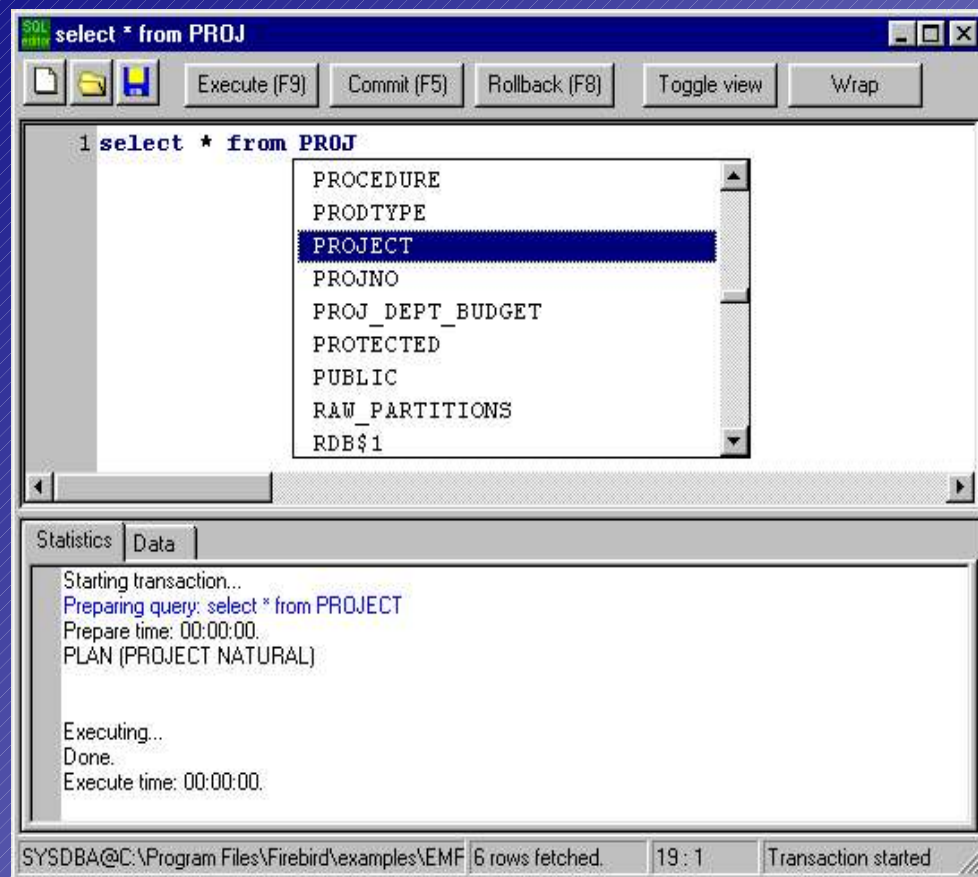 * wxWidgets

wxWidgets

* Native look and feel
  * add missing widgets
* Underlying toolkits used
  * MS Windows API
  * Gtk+ versions 1 and 2 (why?)
  * Carbon
  * Motif
  * X11

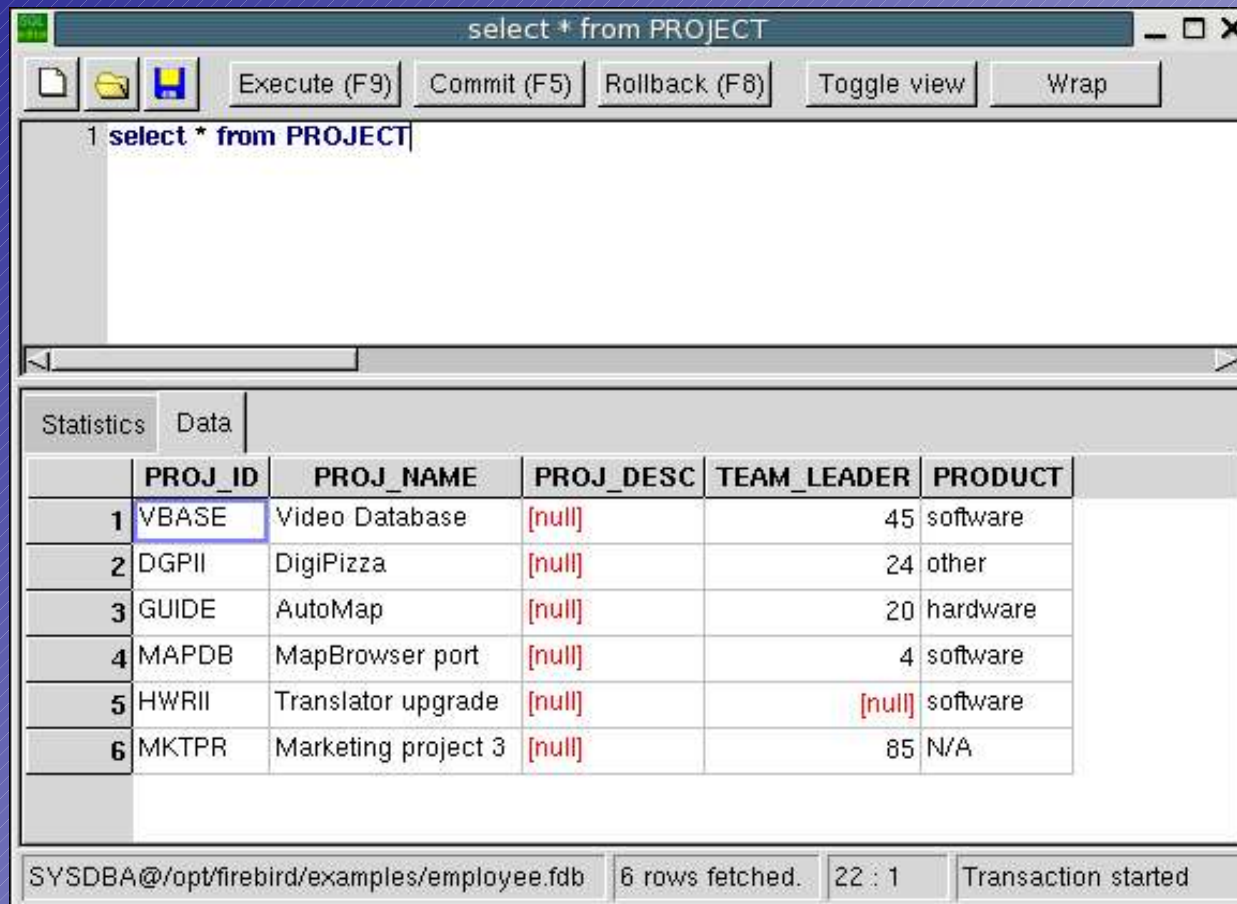# Windows port

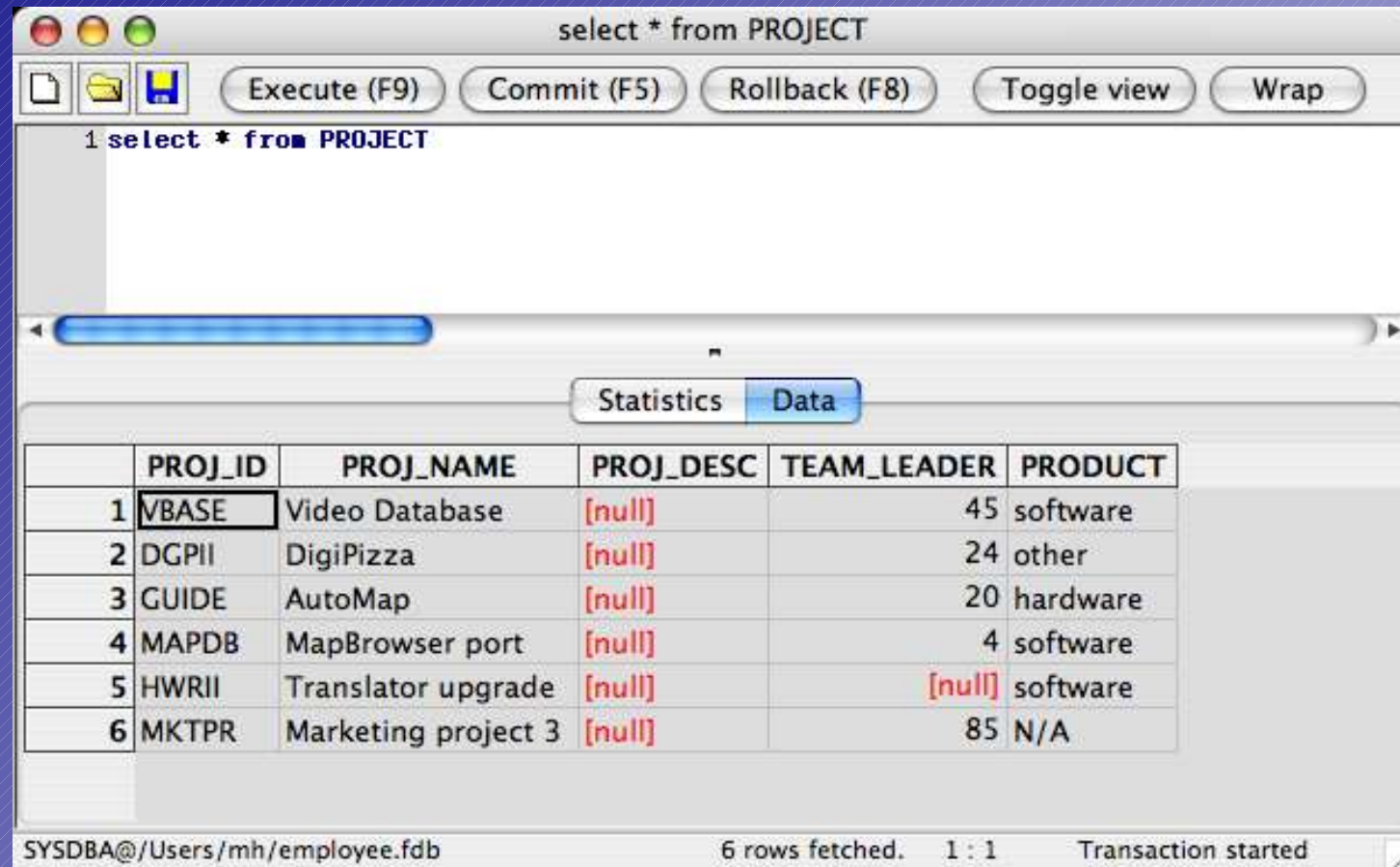Windows NT, 98, Me, 2000, XP, 2003, Vista

Linux, FreeBSD

Gtk1 and Gtk2 toolkit, Unicode and ANSI variants

Mac OS X

Using Carbon toolkit

Non-GUI classes in wxWidgets

* Clipboard handling

* Drag and drop

* Multi-threading

* Image loading and saving

* HTML viewing

* Printing

* Filesystem

* etc.

Cross platform compiling of wxWidgets

* GNU GCC – works on all platforms

    * MinGW & Msys for Windows

* MSVC – fast, easier debugging

* Borland's Free Compiler – usable for smaller projects

* wxWidgets can be built with:

    * DJGPP, Digital Mars, CodeWarrior

    * Sun CC, Symantec C++, Watcom C++

    * IBM Visual Age, AIX Compiler (xlc)

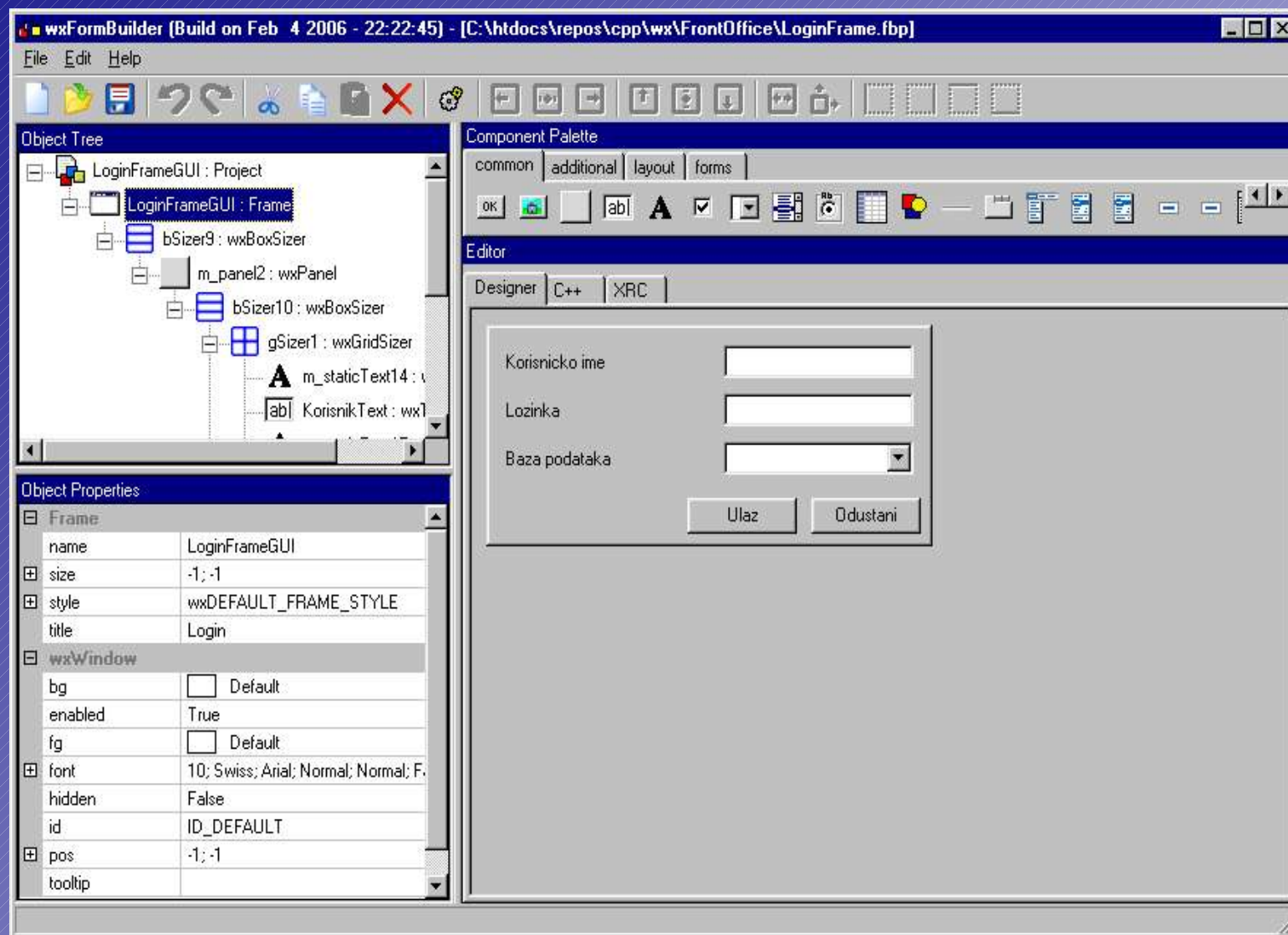# GUI Designers for wxWidgets
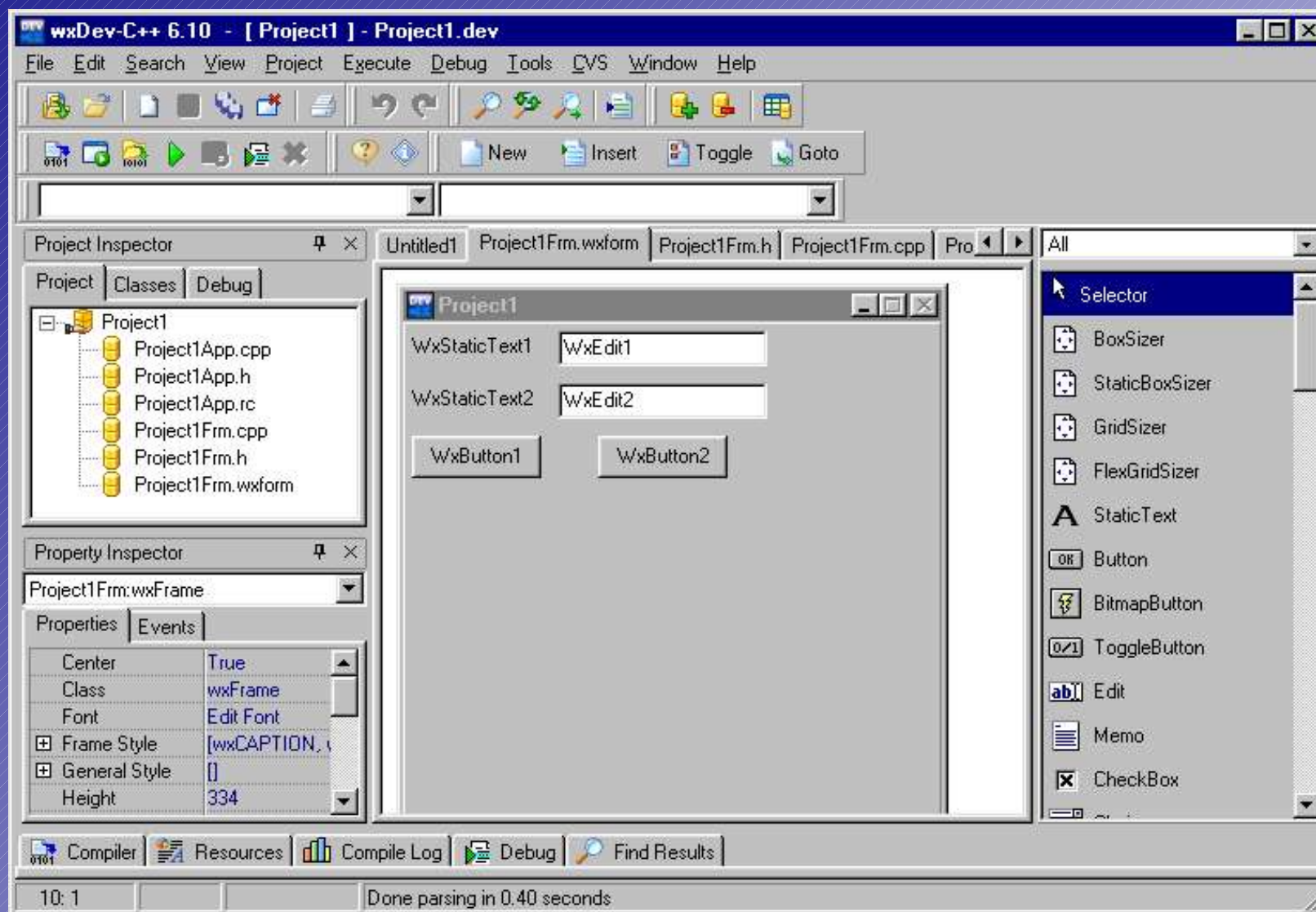
* Without event handler support

  * wxFormBuilder (C++, built with wx)

  * wxGlade (one of first free tools)

* With event handler support

  * wxDesigner

  * VisualWx

  * DialogBlocks (wx team leader)

  * wxDev-C++

wxFormBuilder

IDE and RAD: wxDev-C++

Other IDE software

* CodeBlocks

* MinGW developer studio

* Eclipse

* Chinook

Cross-platform C++ access to Firebird

* ODBC
  * Microsoft ODBC, UnixODBC, iODBC
  * wxODBC or libodbc++ for access
* Firebird C API - fast, efficient, error prone
* SQLAPI++   commercial
  * FB, Oracle, MSSQL, Sybase, DB2, MySQL
* DatabaseLayer
  * FB, MySQL, Postgres, ODBC – built for wxWidgets

IBPP

* Thin C++ wrapper around Firebird C API
* Functionality encapsulated in objects
* Open source license
* Full support for Firebird features
* Firebird - only
* Actively supported and maintained
* Uses standard C++, highly portable
* Runs for years in production

Bakefile

* Issue I: Multiple operating systems

* Issue II: Various compilers

* Up to wxWidgets 2.4 – manual makefiles

* wxWidgets 2.6 and higher – Bakefile

* Single build system for all

* Edit a single .bkl file

* Generates makefiles and project files

* Open source, written in Python

Bakefile setup

* Supplied bakefiles suitable for libraries

* Writing bakefiles from scratch complex

* Template project

  * Bakefile for Win32, Linux, OSX, FreeBSD

  * IBPP support

  * Simple to setup (demo)

  * Easy to add your .cpp and .h files

  * Available at FlameRobin website

Comparison with Delphi

* wxDev-C++ for Windows developers

* wxFormBuilder for Linux developers

* Single tool vs toolchain philisophy

* .dfm vs XRC or .cpp classes - inheritance

* No properties

* Event macros (many tools generate)

* Data aware controls – the only true difference

Typical cross-platform issues

* Dialog layout

* Different fonts and control sizes

  * solution: sizers (box, grid, flex, bag)

* HIG: button placing, sizing, dialog content

  * wxStdDialogButtonSizer

  * styleguide classes from FR

  * applications should blend into system

  * Microsoft, Apple, Gnome project

Cross platform issues

* Conversion of strings (needed for IBPP)

    * wx2std, std2wx

* Fatal exception handling

    * exceptions propagating through Gtk+ C code

    * protect your event handlers with try..catch

* wxStandardPaths (desktop, docs, ...)

* Multiple displays

    * wxDisplay

Questions

?????