RAD Studio 12

Behind the Build

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Embarcadero & Idera

Embarcadero is

- Owned by Idera, www.ideracorp.com
- Part of the Dev Tools division

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BitTitan
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PreEmptive

What is RAD Studio?

The ultimate IDE for building

- multi-platform

- high-performance

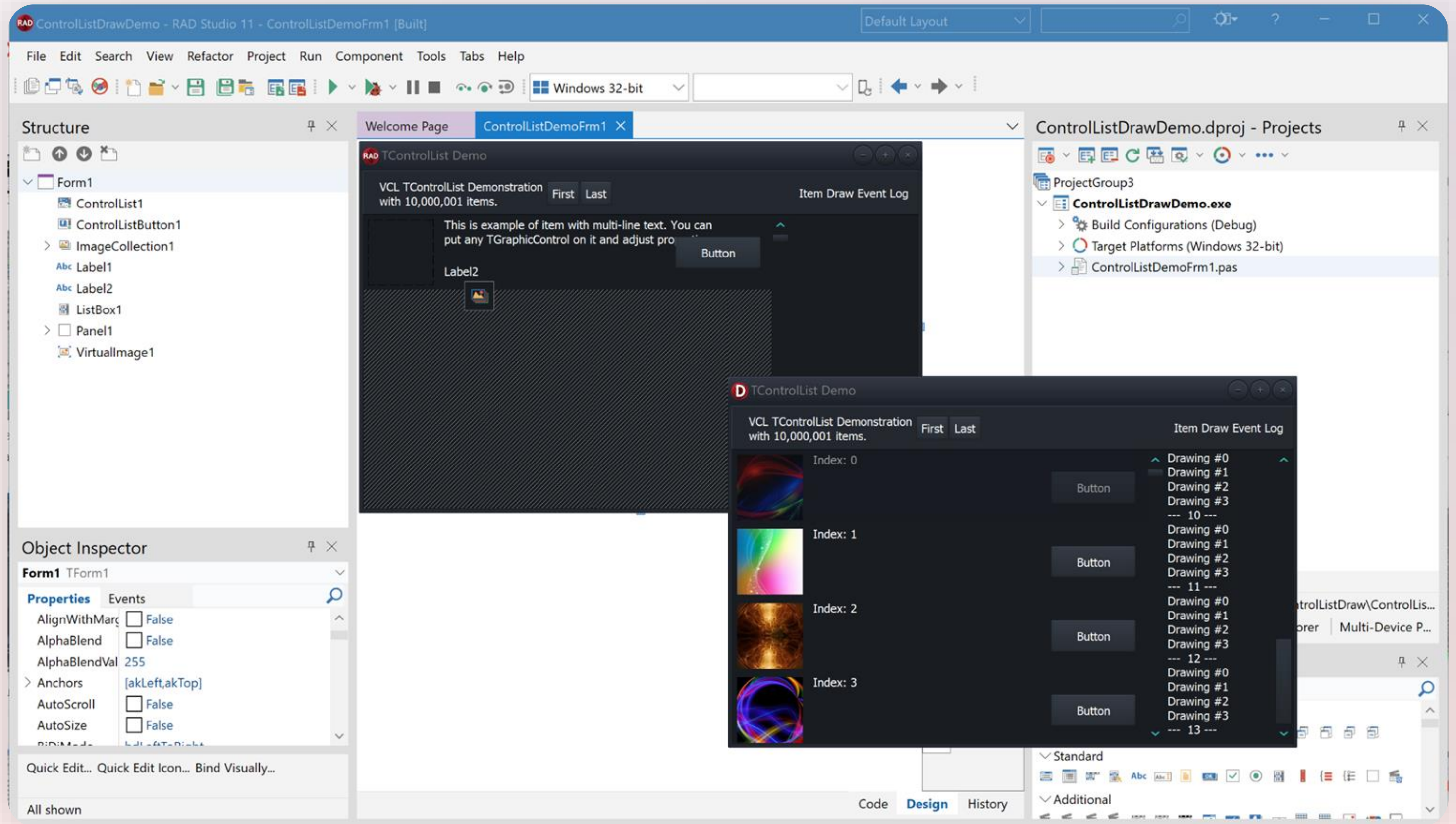
- native applications

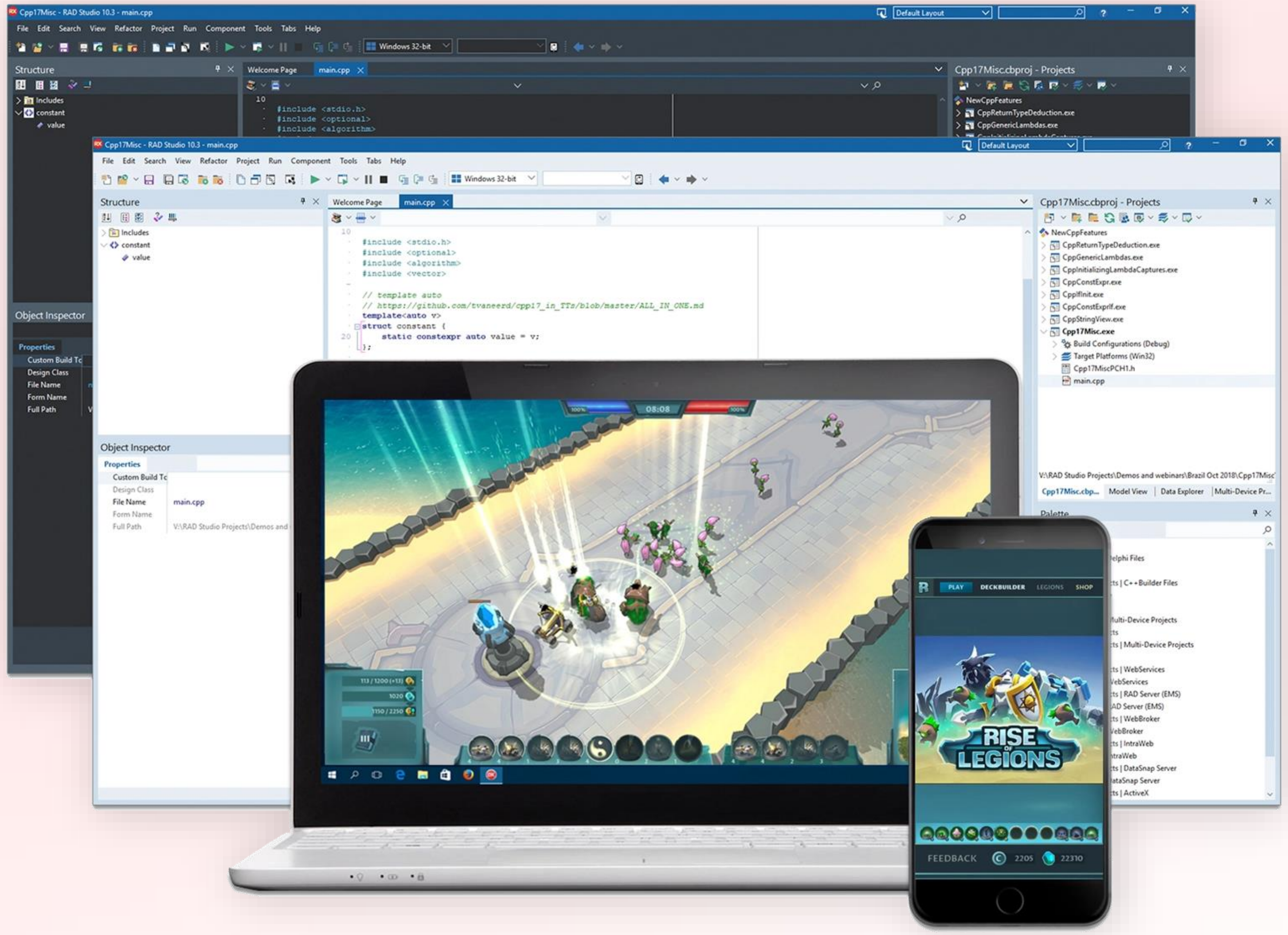
in Modern Object Pascal

and Extended C++

with powerful visual design tools

and integrated toolchains





What is great in RAD Studio?

Platform API Access

Gives you access to all the platform APIs on all platforms.

Developer Productivity

Shipping is a feature. Get to market 5x faster.

Fast Native Apps

Native compilers give your apps the speed they need.

Database Access

Key to Delphi’s initial design, database access is easy and fast.

Visual Designers

Forget prototyping in another tool, just design it and finish it in one IDE

Strong Community

Technology Partners, MVPs, trainers, authors and developers – worldwide

Backward Compatibility

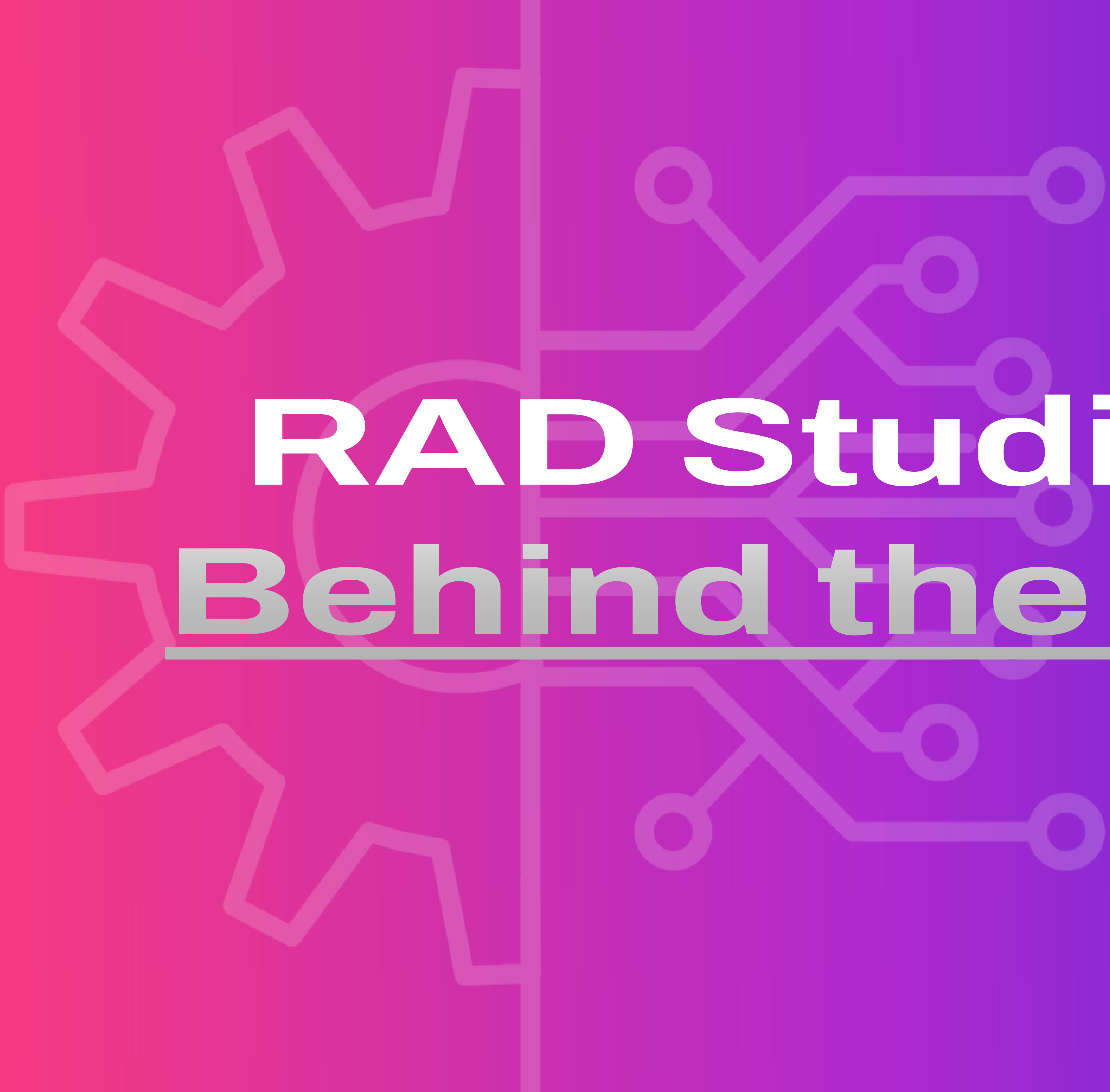
You have an investment in your code, keep your code relevant.

Where is RAD Studio Used Today?

Development with Delphi and C++Builder powers a large number of businesses *today*

- Oil and Gas
- Accounting
- Automotive
- Healthcare
- Video Games
- E-Invoices
- Government
- Television
- Tax Returns
- Advertising
- Aerospace
- Kiosk Applications
- Flights Management
- Business Analytics
- Database Front Ends
- Trains and Railways
- Engineering Projects
- Complete ERP Systems
- Manufacturing
- Circuit Boards Design
- Large Data Processing
- Communication Software
- Remote Computer Access
- Systems Administration
- Agricultural Management
- Mobile Apps Of All Types
- Production Systems Monitoring
- Real-Time Finances
- Warehouse Automation
- Shipping & Logistics
- Gis Applications
- Measurements
- Architecture
- Music Editors
- IoT Management
- Point of Sales
- Animated Movies
- Banking Systems
- Developer Tools
- Trucks Tracking

There is no business segment RAD Studio isn’t present



RAD Studio 12

Behind the Build

Safe Harbor Statement

Any plans discussed represent our intentions as of this date, and our development plans and priorities are subject to change, due to competitive factors, availability of resources and other matters common to all independent software vendors.

Accordingly, we can't offer any commitments or other forms of assurance that we will ultimately release any or all of the described products on the schedule or in the order described, or at all.

These general indications of development schedules or "product roadmaps" should not be interpreted or construed as any form of a commitment, and our customers' rights to upgrades, updates, enhancements and other maintenance releases will be set forth only in the applicable software license agreement.

IMPORTANT: Features are not committed until completed and Generally Available (GA) released

RAD 12.0 Preview

Currently in Beta, called “Yukon”. Exclusively for customers with an active update subscription

IMPORTANT: Features previewed here are not committed until completed and GA released

Initializing .NET Services

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New for C++

1. **Clang Upgrade**
   - New compiler, linker, RTL, STL…
   - An entire reworked toolchain

1. **Visual Assist in the IDE**
   - Code completion
   - Navigation
   - More…

New for C++

1. **Clang Upgrade**
   - New compiler, linker, RTL, STL…
   - An entire reworked toolchain

{

- modern C++ standards
  - run C++ code you find online, use third party libraries
  - use modern safe coding standards
  - write code you expect to work and have it work
- performant apps
- good debugging
- matches platform standards
- supports existing code with C++Builder-isms

1. **Visual Assist in the IDE**
   - Code completion
   - Navigation
   - More…

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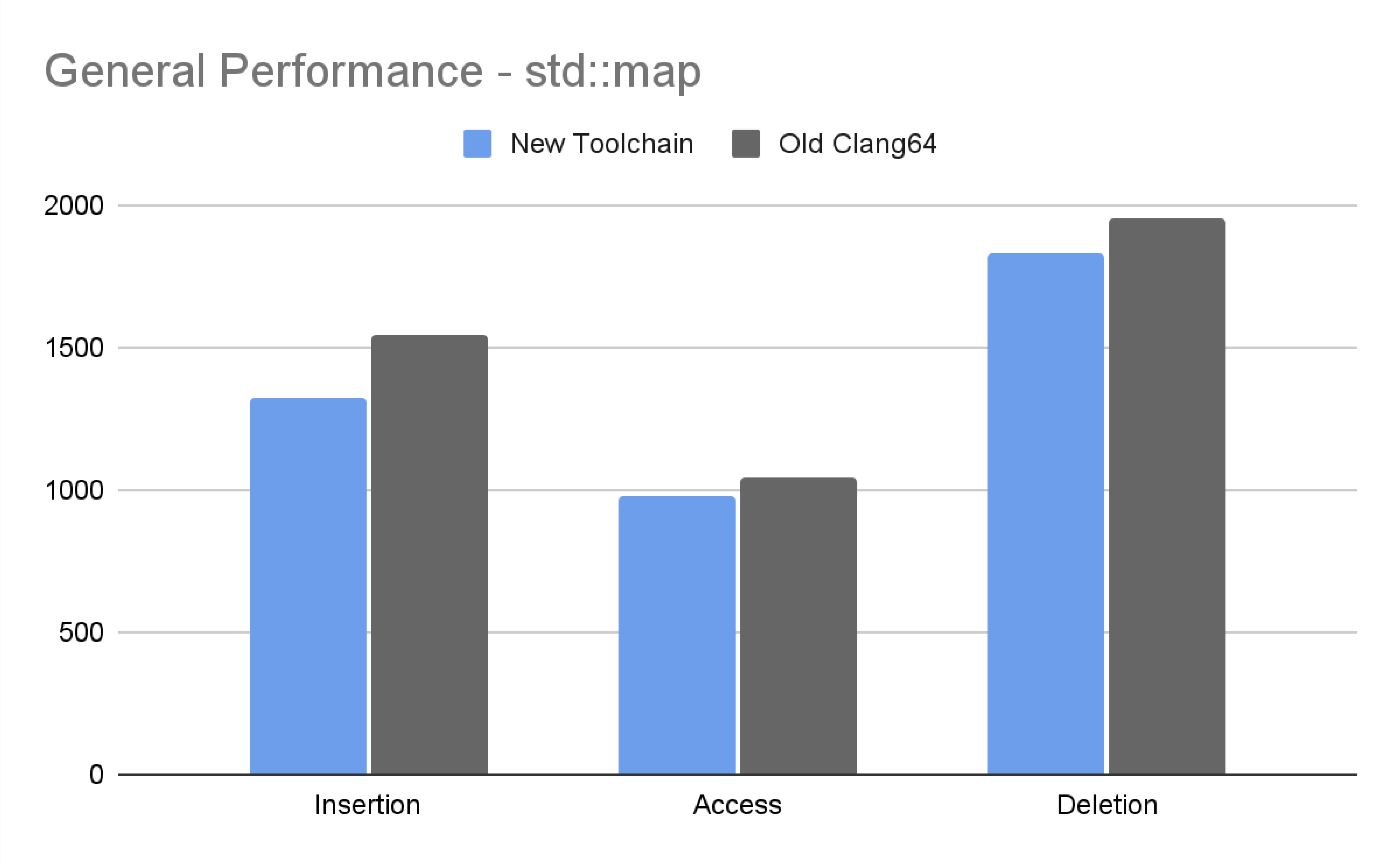
1. **Visual Assist in the IDE**
   - ○ Code completion
   - ○ Navigation
   - ○ More…

- productivity is key!
  - ○ fast code completion
  - ○ understand your code structure
  - ○ navigate around your code
  - ○ refactor and edit your code

Performance: from numbers to visuals

Milliseconds, 2 million entries: *smaller is better!*

std::map: memory allocation, freeing, traversal



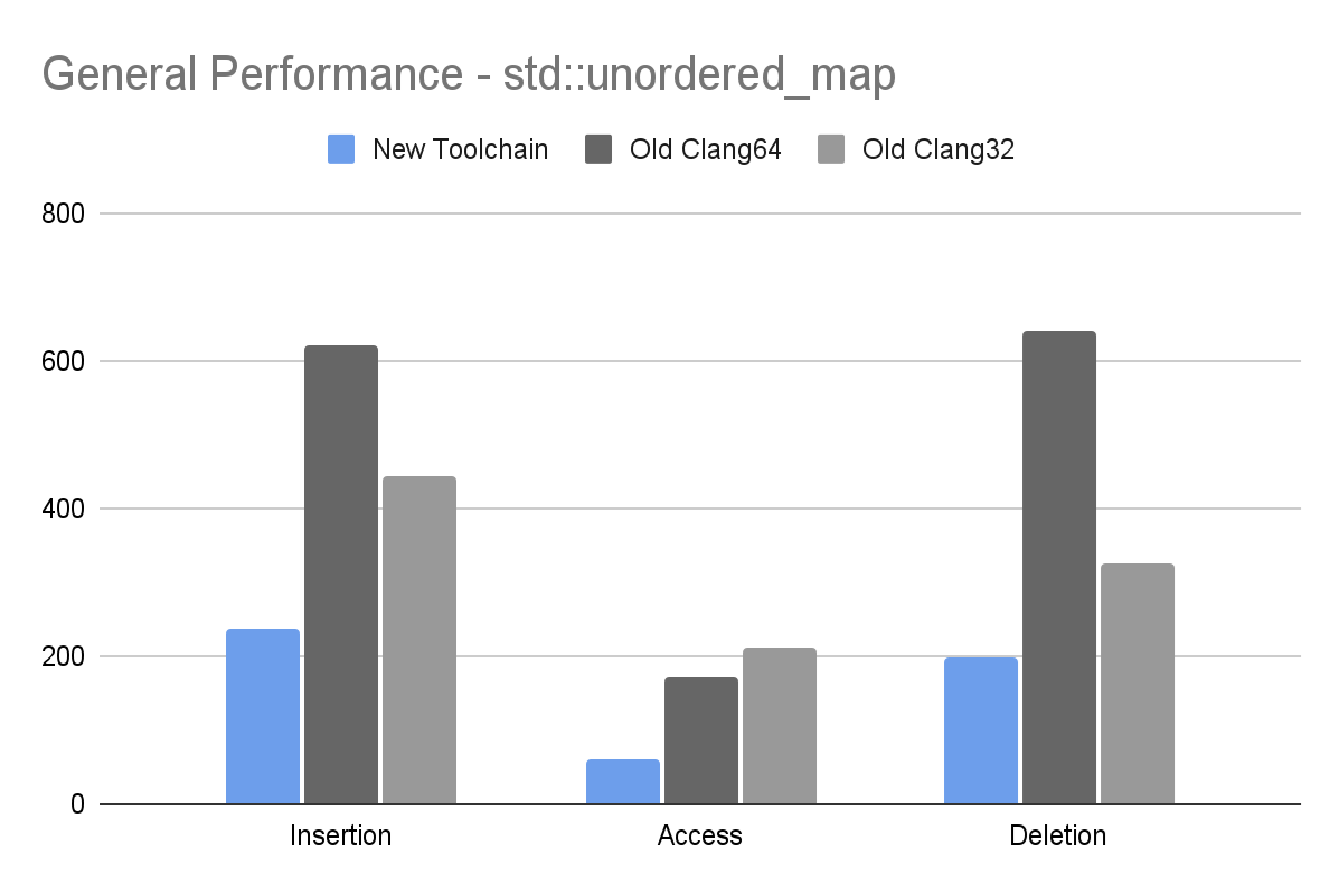
6 to 14% faster than the old Clang Win64

(Clang 32 on par)

Performance: from numbers to visuals

Milliseconds, 2 million entries: *smaller is better!*

std::unordered_map: hashing, STL performance



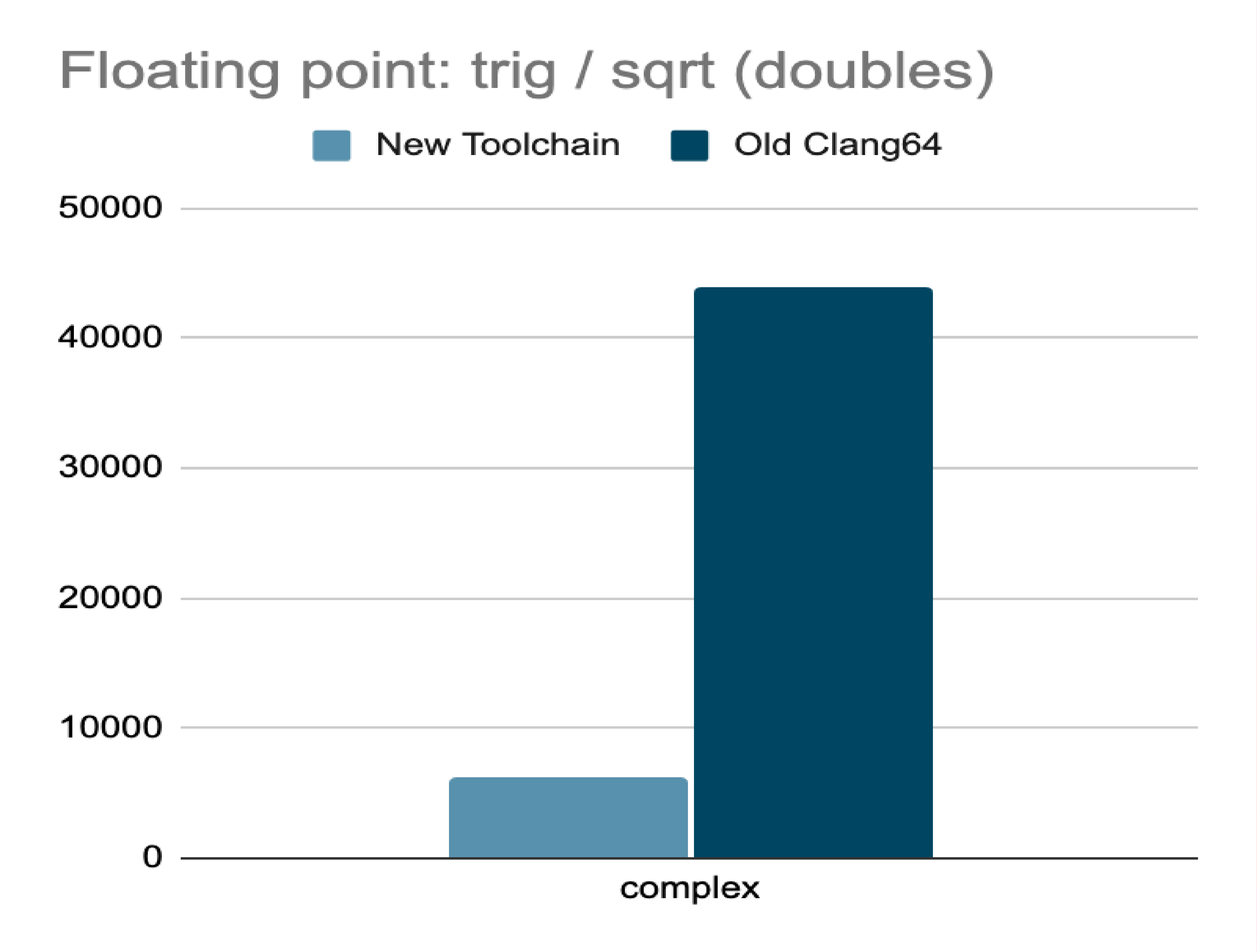
40 to 70% faster than old Clang Win32!

60 to 70% faster than old Clang Win64!

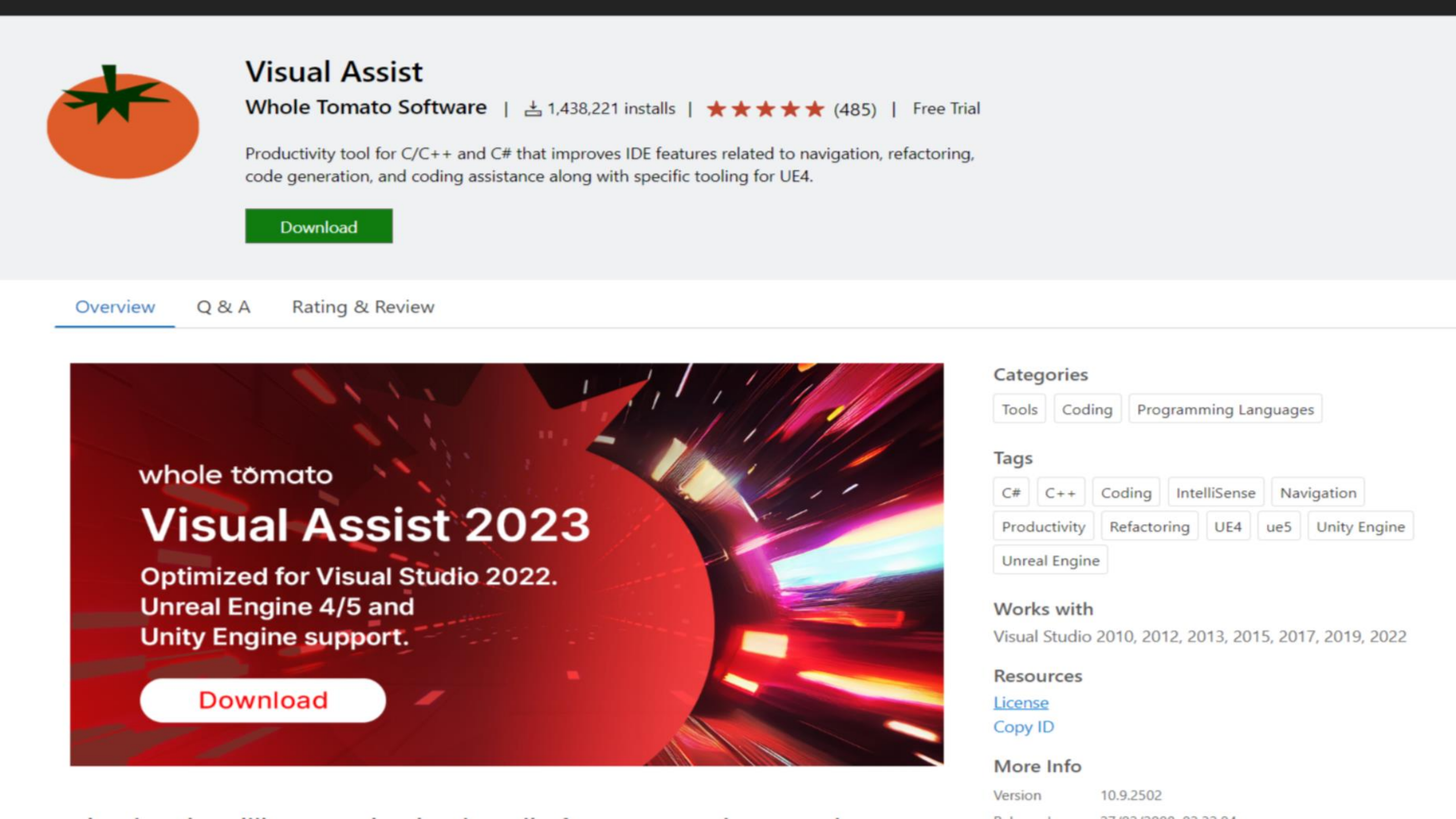
Performance: from numbers to visuals

Milliseconds, 2 million entries: *smaller is better!*

Floating point math: trigonometry and sqrt



New toolchain is **10x faster** than old Win64!!!



Visual Assist

Whole Tomato Software | 1,438,221 installs | ★★★★★ (485) | Free Trial

Productivity tool for C/C++ and C# that improves IDE features related to navigation, refactoring, code generation, and coding assistance along with specific tooling for UE4.

Download
Overview
Q & A
Rating & Review
whole tomato
Visual Assist 2023
Optimized for Visual Studio 2022. Unreal Engine 4/5 and Unity Engine support.
Download

Categories

Tools | Coding | Programming Languages

Tags

C# | C++ | Coding | IntelliSense | Navigation | Productivity | Refactoring | UE4 | ue5 | Unity Engine | Unreal Engine

Works with

Visual Studio 2010, 2012, 2013, 2015, 2017, 2019, 2022

Resources

License

Copy ID

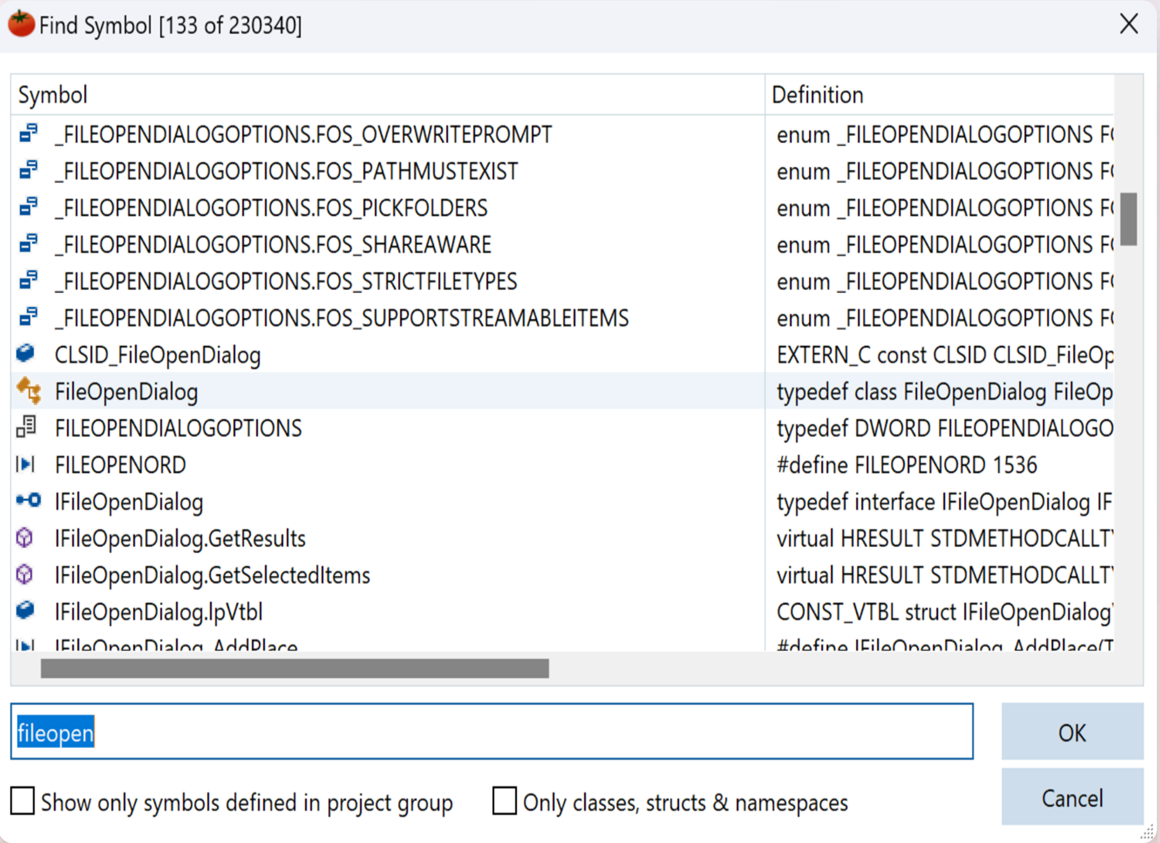
More Info

Version	10.9.2502

Visual Assist for C++Builder

The specific features planned are:

- Code completion
  - Maybe parameter completion too?
- Find Symbol
- Find References
- Toggle between implementation and declaration
- Go to implementation (including ancestors)
- VA Outline window
- Rename refactoring

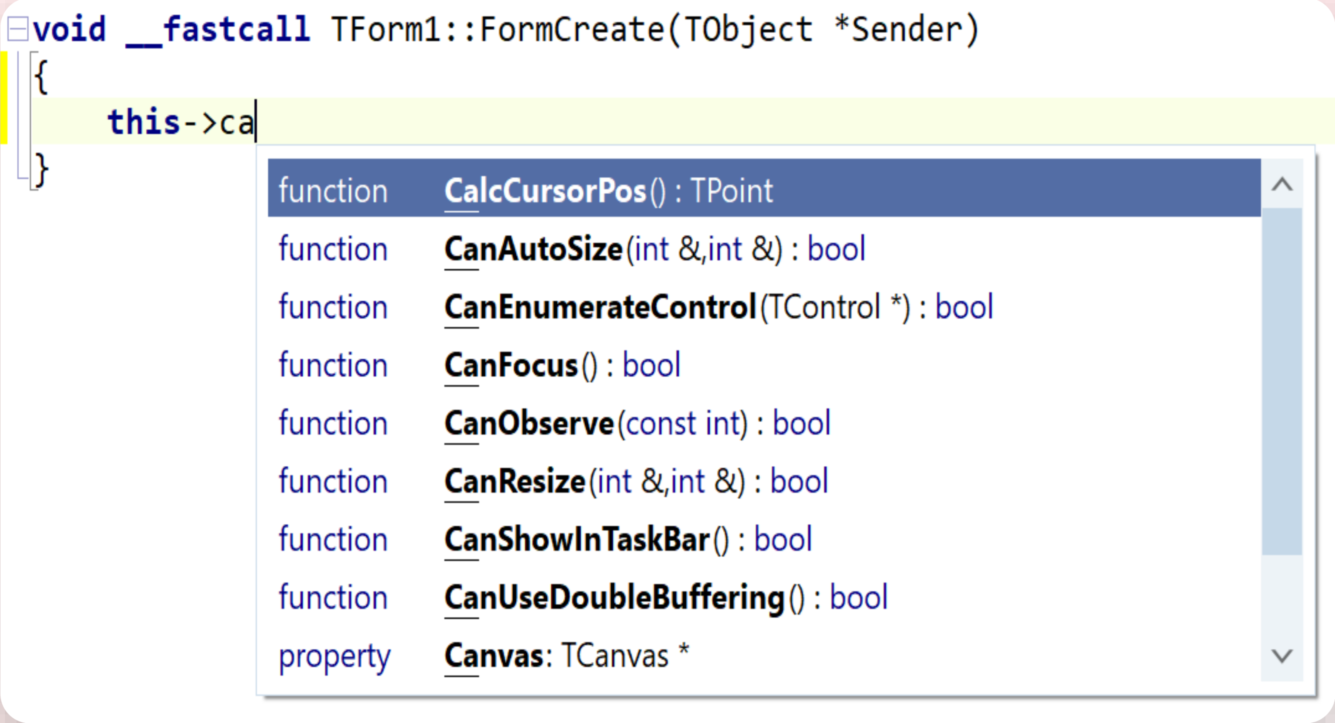


Find Symbol [133 of 230340]

Symbol	Definition
_FILEOPENDIALOGOPTIONS.FOS_OVERWRITEPROMPT	enum _FILEOPENDIALOGOPTIONS F
_FILEOPENDIALOGOPTIONS.FOS_PATHMUSTEXIST	enum _FILEOPENDIALOGOPTIONS F
_FILEOPENDIALOGOPTIONS.FOS_PICKFOLDERS	enum _FILEOPENDIALOGOPTIONS F
_FILEOPENDIALOGOPTIONS.FOS_SHAREAWARE	enum _FILEOPENDIALOGOPTIONS F
_FILEOPENDIALOGOPTIONS.FOS_STRICTFILETYPES	enum _FILEOPENDIALOGOPTIONS F
_FILEOPENDIALOGOPTIONS.FOS_SUPPORTSTREAMABLEITEMS	enum _FILEOPENDIALOGOPTIONS F
CLSID_FileOpenDialog	EXTERN_C const CLSID CLSID_FileOp
FileOpenDialog	typedef class FileOpenDialog FileOp
FILEOPENDIALOGOPTIONS	typedef DWORD FILEOPENDIALOGO
FILEOPENORD	#define FILEOPENORD 1536
IFileOpenDialog	typedef interface IFileOpenDialog IF
IFileOpenDialog.GetResults	virtual HRESULT STDMETHODCALLT
IFileOpenDialog.GetSelectedItems	virtual HRESULT STDMETHODCALLT
IFileOpenDialog.lpVtbl	CONST_VTBL struct IFileOpenDialog
IFileOpenDialog_AddPlace	#define IFileOpenDialog_AddPlace(T

fileopen

☐ Show only symbols defined in project group ☐ Only classes, structs & namespaces



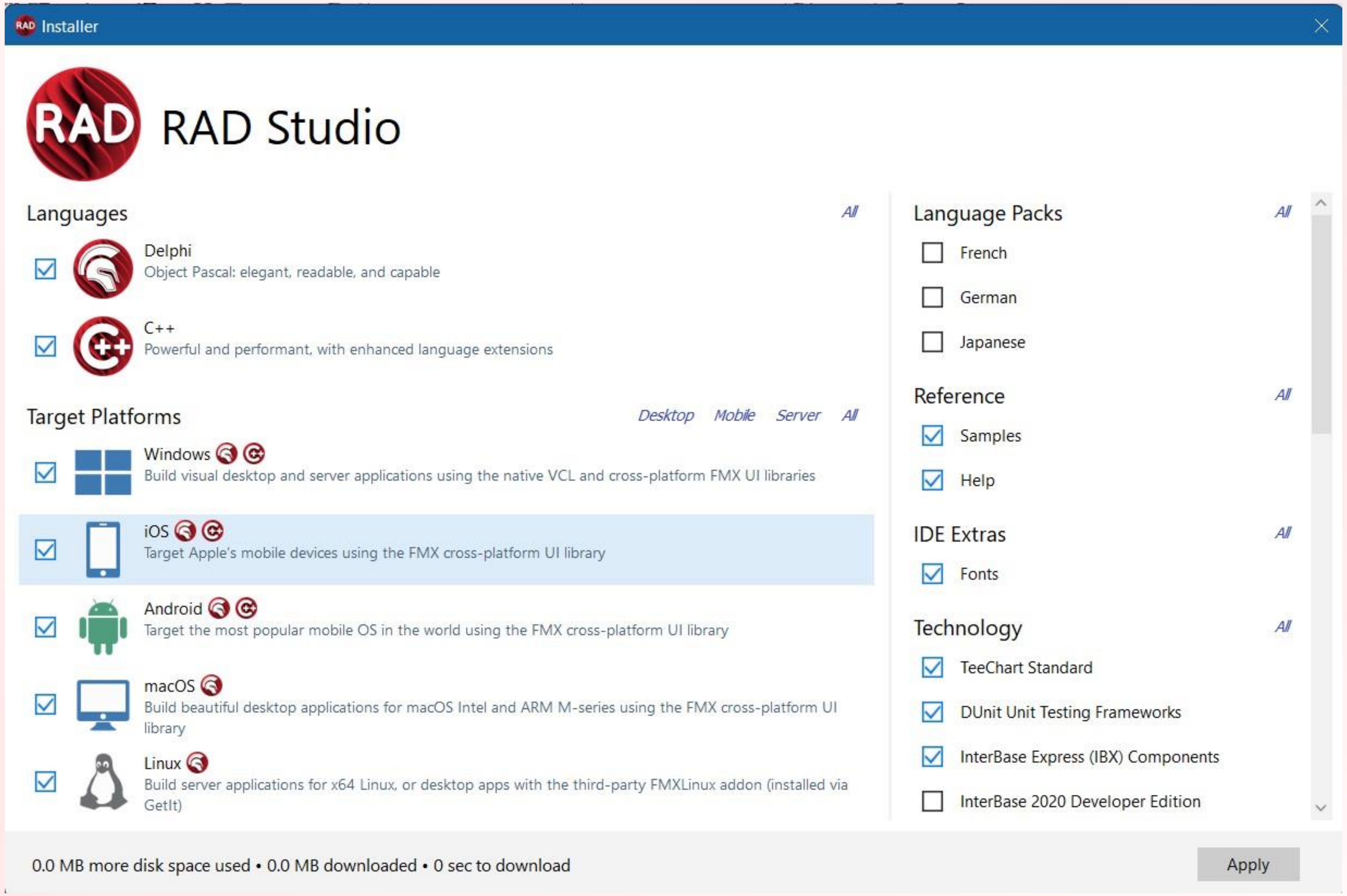
```
void __fastcall TForm1::FormCreate(TObject *Sender)
{
    this->ca
}
```

function	CalcCursorPos() : TPoint
function	CanAutoSize(int &,int &) : bool
function	CanEnumerateControl(TControl *) : bool
function	CanFocus() : bool
function	CanObserve(const int) : bool
function	CanResize(int &,int &) : bool
function	CanShowInTaskBar() : bool
function	CanUseDoubleBuffering() : bool
property	Canvas: TCanvas *

New Installer UX

Significantly reworked the platforms and features installer dialog box, adopting IDE styles and standard VCL controls for the UI

* Same for Tools -> Manage Features



Installer

RAD Studio

Languages — All

☑ Delphi
Object Pascal: elegant, readable, and capable

☑ C++
Powerful and performant, with enhanced language extensions

Target Platforms — Desktop Mobile Server All

☑ Windows
Build visual desktop and server applications using the native VCL and cross-platform FMX UI libraries

☑ iOS
Target Apple's mobile devices using the FMX cross-platform UI library

☑ Android
Target the most popular mobile OS in the world using the FMX cross-platform UI library

☑ macOS
Build beautiful desktop applications for macOS Intel and ARM M-series using the FMX cross-platform UI library

☑ Linux
Build server applications for x64 Linux, or desktop apps with the third-party FMXLinux addon (installed via GetIt)

Language Packs — All

□ French
□ German
□ Japanese

Reference — All

☑ Samples
☑ Help

IDE Extras — All

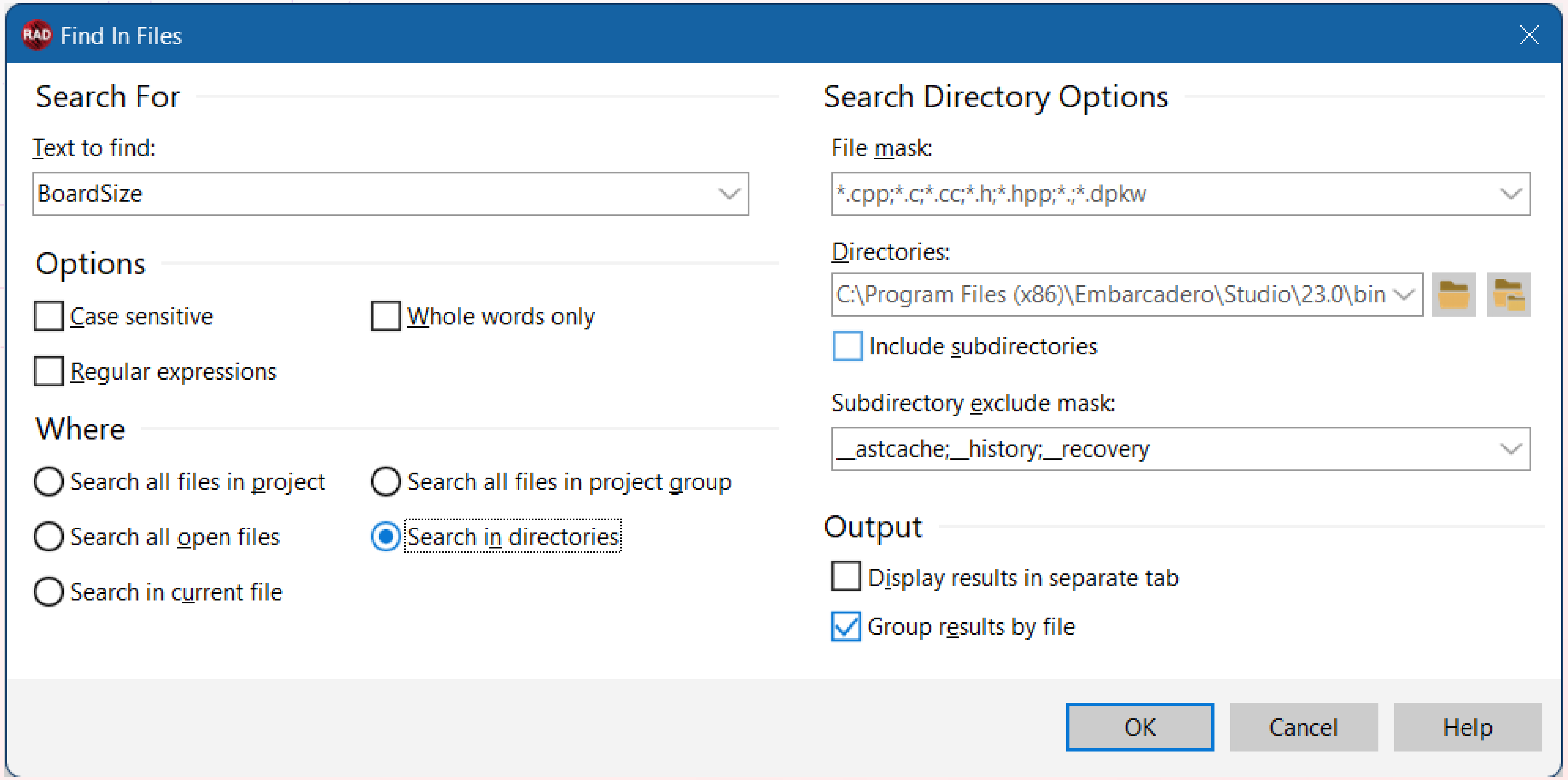
☑ Fonts

Technology — All

☑ TeeChart Standard
☑ DUnit Unit Testing Frameworks
☑ InterBase Express (IBX) Components
□ InterBase 2020 Developer Edition

0.0 MB more disk space used • 0.0 MB downloaded • 0 sec to download

New in the IDE



Find In Files

Search For

Text to find: BoardSize

Options

☐ Case sensitive ☐ Whole words only

☐ Regular expressions

Where

○ Search all files in project ○ Search all files in project group

○ Search all open files ● Search in directories

○ Search in current file

Search Directory Options

File mask: *.cpp;*.c;*.cc;*.h;*.hpp;*.;*.dpkw

Directories: C:\Program Files (x86)\Embarcadero\Studio\23.0\bin

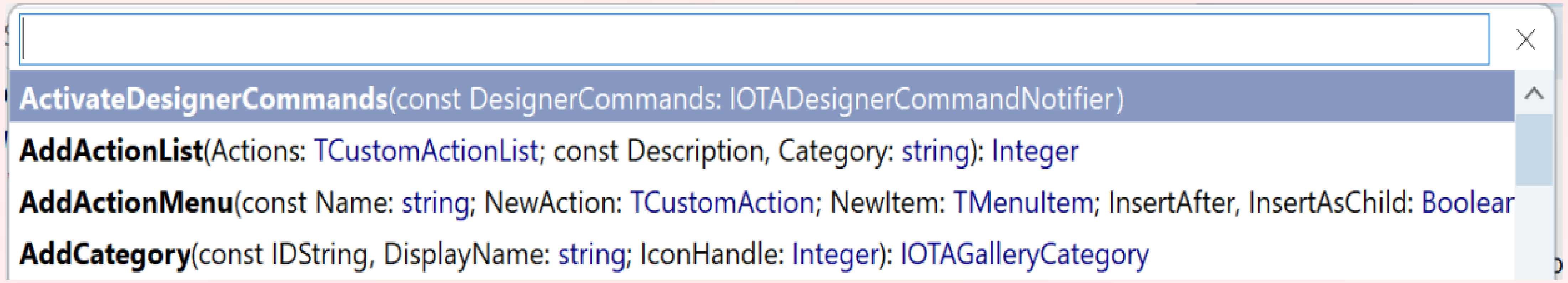
☐ Include subdirectories

Subdirectory exclude mask: __astcache;__history;__recovery

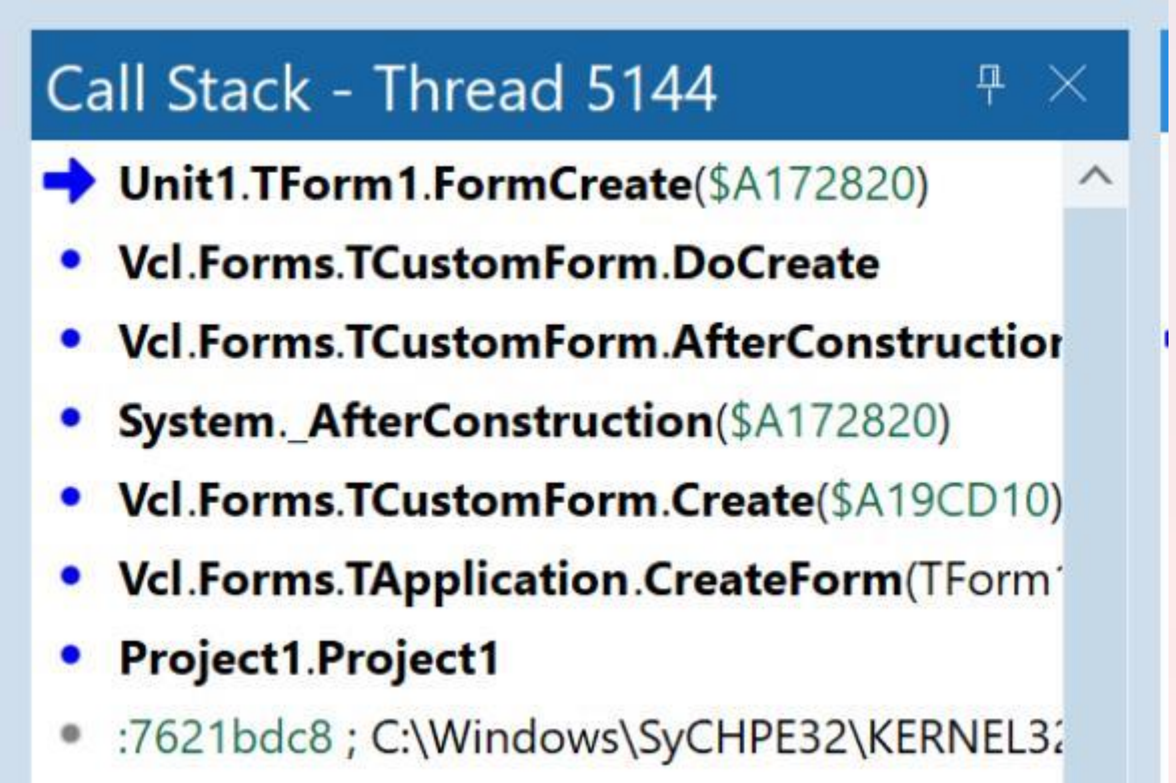
Output

☐ Display results in separate tab

☑ Group results by file

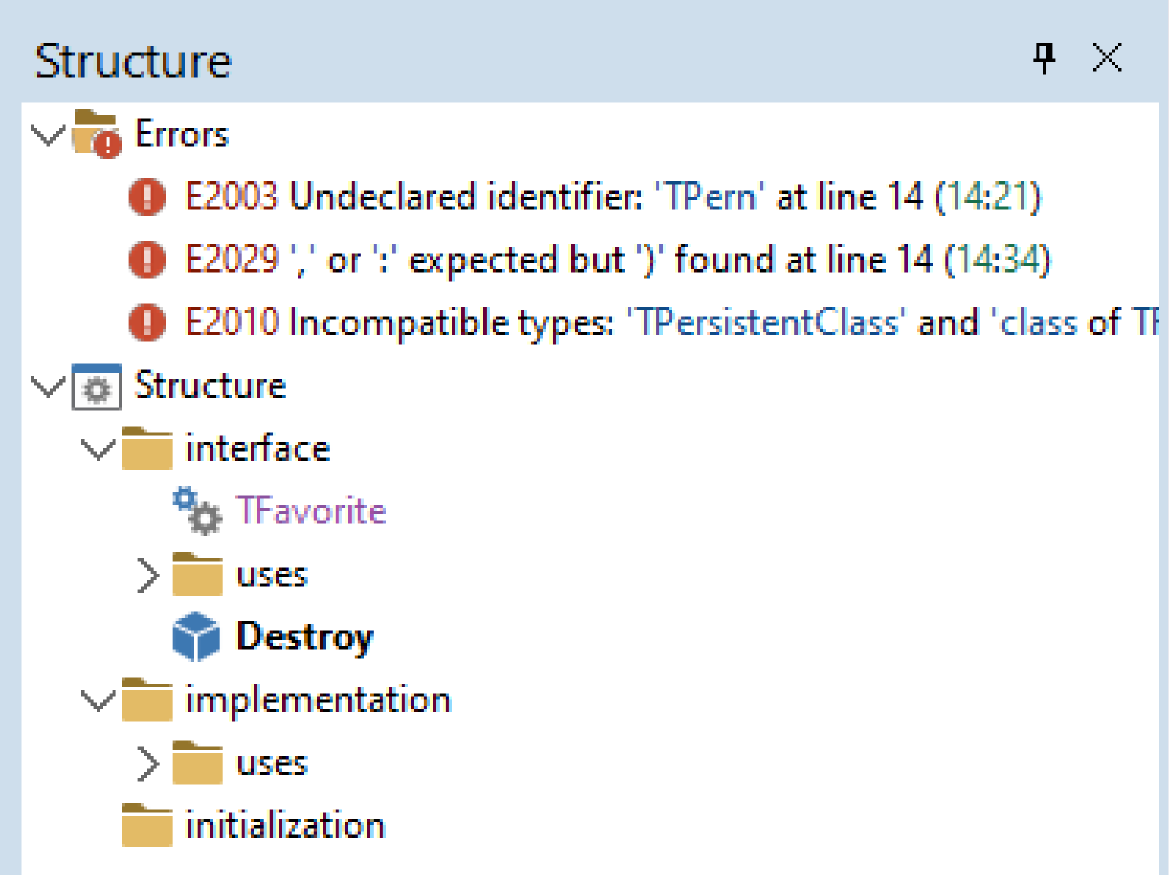


```
ActivateDesignerCommands(const DesignerCommands: IOTADesignerCommandNotifier)
AddActionList(Actions: TCustomActionList; const Description, Category: string): Integer
AddActionMenu(const Name: string; NewAction: TCustomAction; NewItem: TMenuItem; InsertAfter, InsertAsChild: Boolear
AddCategory(const IDString, DisplayName: string; IconHandle: Integer): IOTAGalleryCategory
```



Call Stack - Thread 5144

```
Unit1.TForm1.FormCreate($A172820)
Vcl.Forms.TCustomForm.DoCreate
Vcl.Forms.TCustomForm.AfterConstructior
System._AfterConstruction($A172820)
Vcl.Forms.TCustomForm.Create($A19CD10)
Vcl.Forms.TApplication.CreateForm(TForm
Project1.Project1
:7621bdc8 ; C:\Windows\SyCHPE32\KERNEL32
```



Structure

- Errors
  - E2003 Undeclared identifier: 'TPern' at line 14 (14:21)
  - E2029 ',' or ':' expected but ')' found at line 14 (14:34)
  - E2010 Incompatible types: 'TPersistentClass' and 'class of TF
- Structure
  - interface
    - TFavorite
    - uses
    - Destroy
  - implementation
    - uses
  - initialization

Delphi Extended String Literals

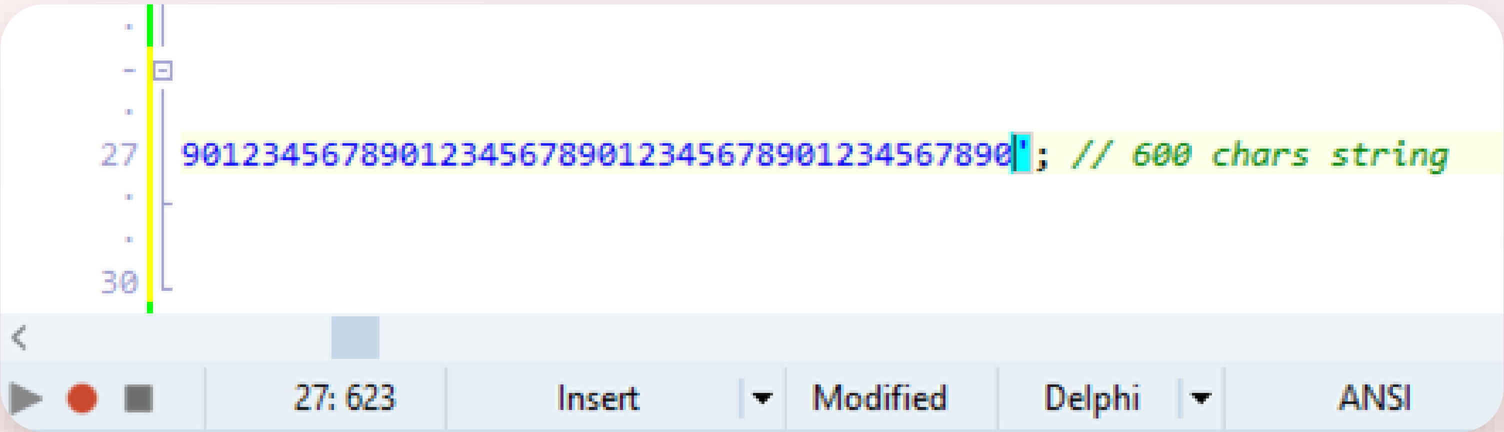
- **Long String Literals**

  String literals are not limited to 255 chars any more

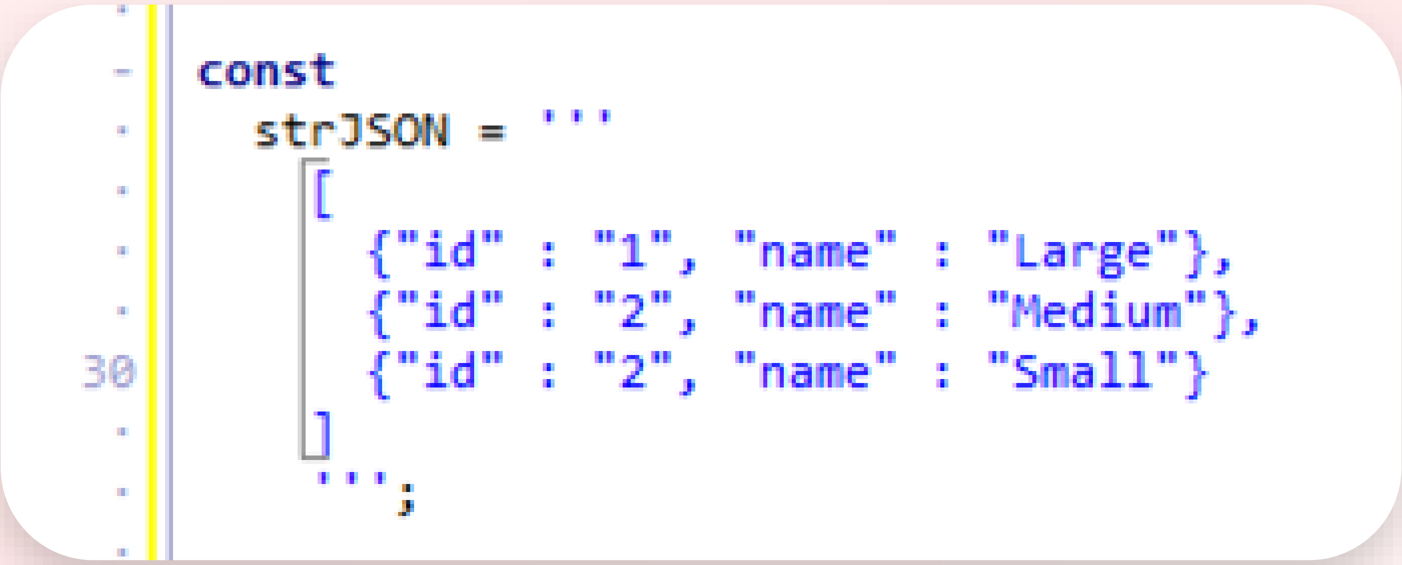
- **Multiline String Literals**

  String literals encompassing multiple lines of text

  Delimited by a triple quote (’’’)
  Delimiters on separate lines
  Closing delimiter determines indentation

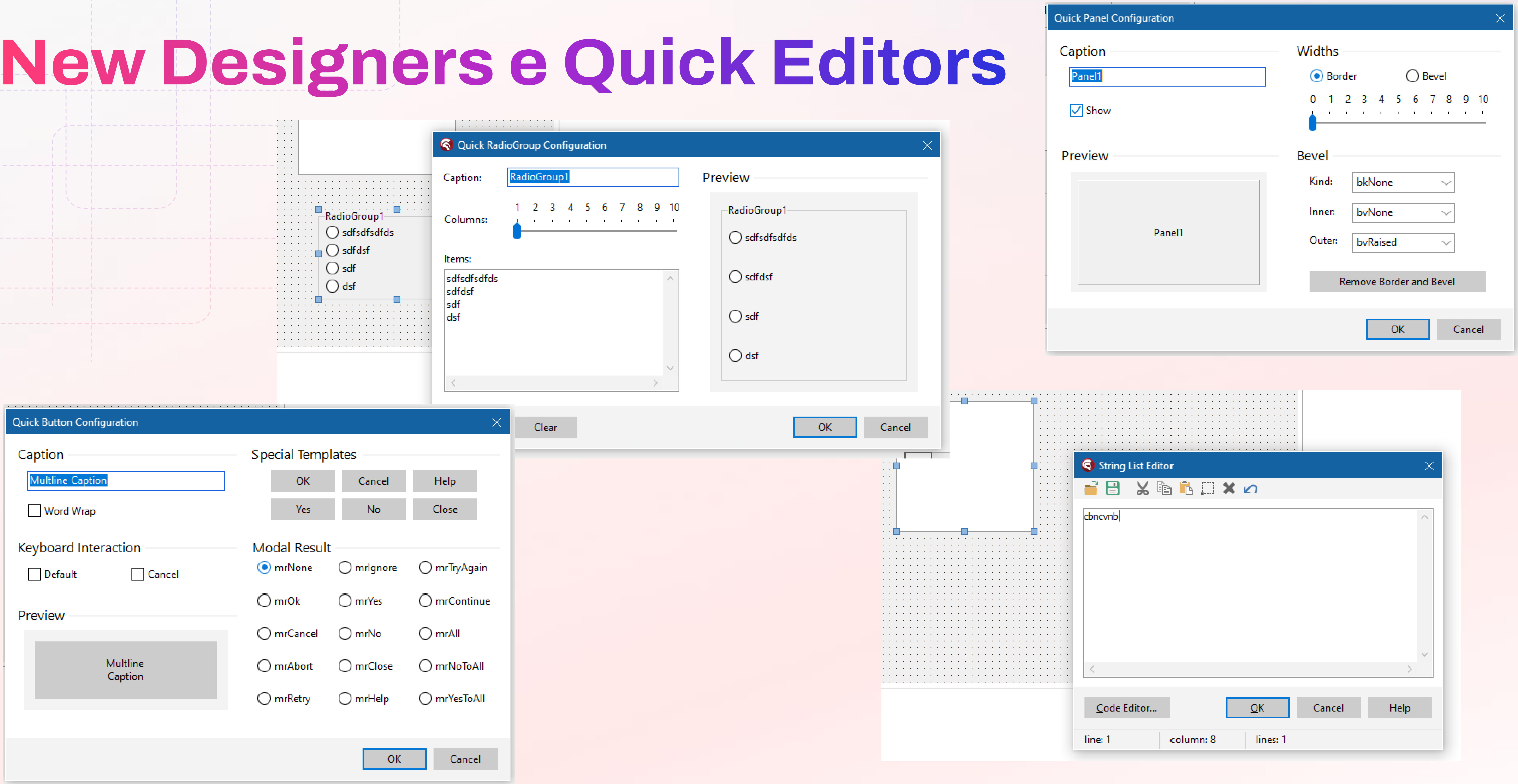


```
90123456789012345678901234567890'; // 600 chars string
```



```
const
  strJSON = '''
    [
      {"id" : "1", "name" : "Large"},
      {"id" : "2", "name" : "Medium"},
      {"id" : "2", "name" : "Small"}
    ]
    ''';
```

New Designers e Quick Editors



Quick RadioGroup Configuration

Caption: RadioGroup1

Columns: 1 2 3 4 5 6 7 8 9 10

Items:

sdfsdfsdfds
sdfdsf
sdf
dsf

Preview

RadioGroup1
○ sdfsdfsdfds
○ sdfdsf
○ sdf
○ dsf

Clear | OK | Cancel

Quick Panel Configuration

Caption: Panel1

☑ Show

Widths: ● Border ○ Bevel

0 1 2 3 4 5 6 7 8 9 10

Preview: Panel1

Bevel

Kind: bkNone

Inner: bvNone

Outer: bvRaised

Remove Border and Bevel

OK | Cancel

Quick Button Configuration

Caption: Multline Caption

□ Word Wrap

Keyboard Interaction: □ Default □ Cancel

Preview: Multline Caption

Special Templates: OK | Cancel | Help | Yes | No | Close

Modal Result

● mrNone ○ mrIgnore ○ mrTryAgain
○ mrOk ○ mrYes ○ mrContinue
○ mrCancel ○ mrNo ○ mrAll
○ mrAbort ○ mrClose ○ mrNoToAll
○ mrRetry ○ mrHelp ○ mrYesToAll

OK | Cancel

String List Editor

cbncvnb

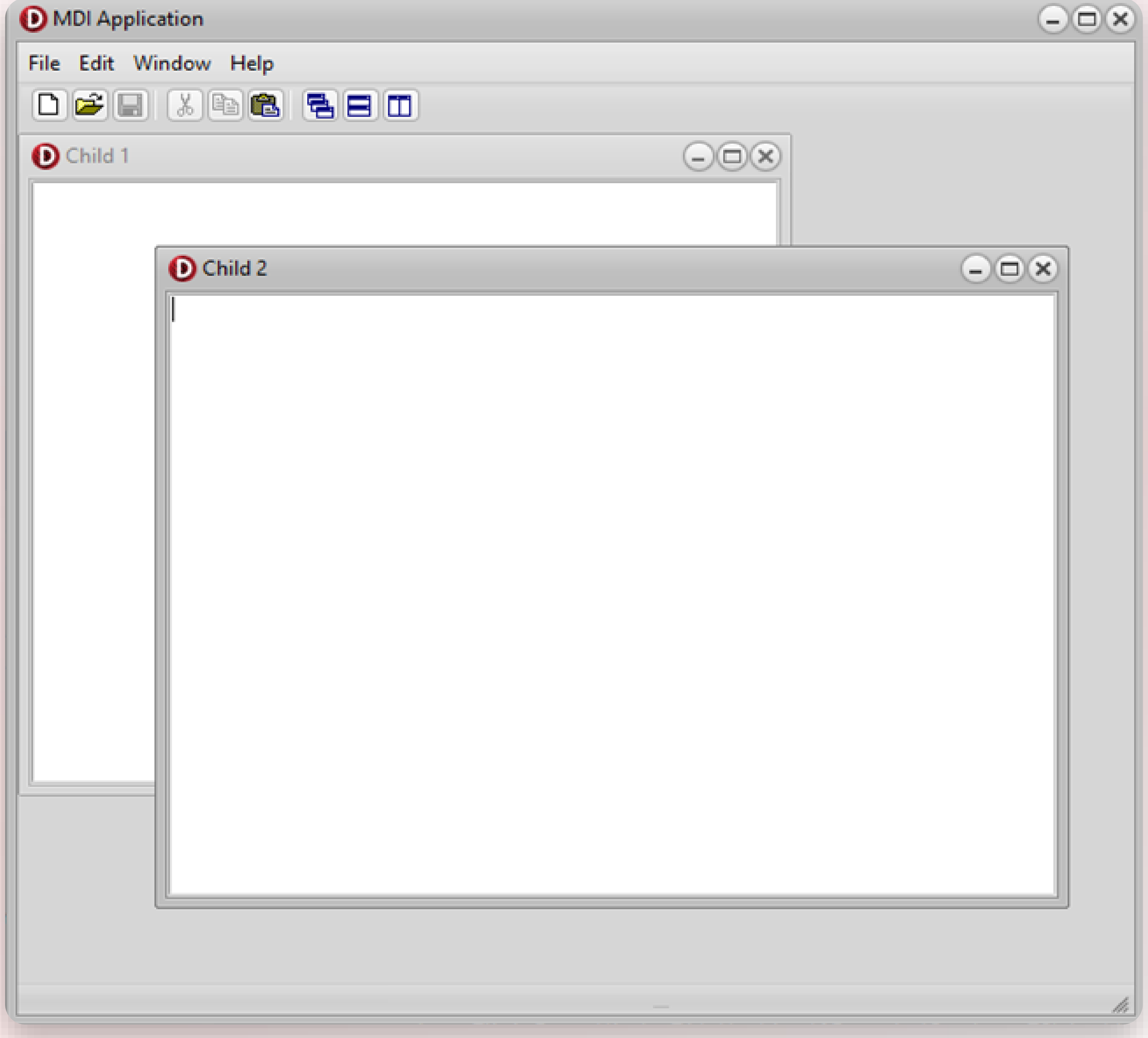
Code Editor... | OK | Cancel | Help

line: 1 column: 8 lines: 1

Reworked VCL MDI and multi-tab architecture

Reworked the VCL MDI (Multi Document Interface)

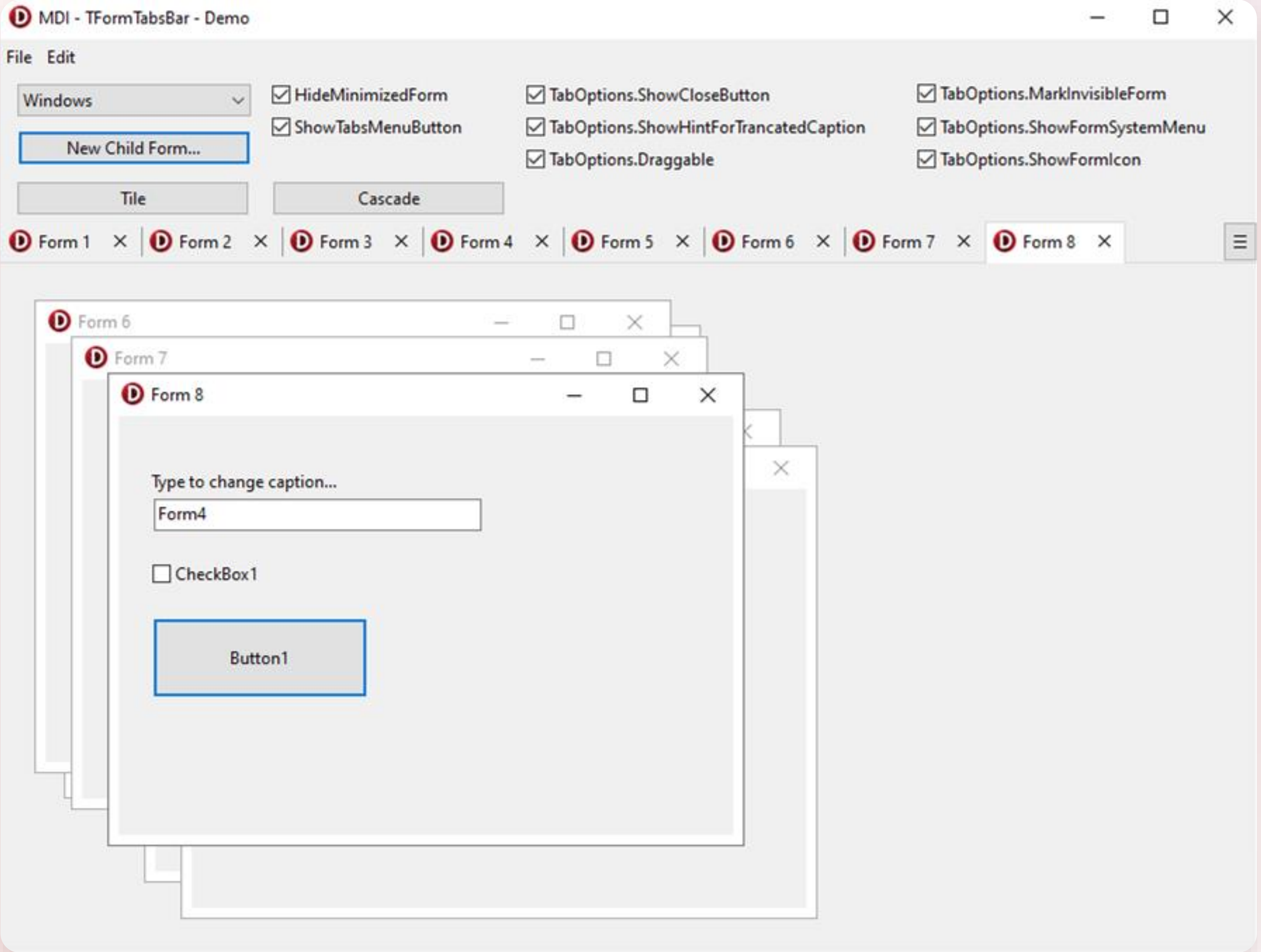
Updated code generated by the MDI wizard



Reworked VCL MDI and multi-tab architecture

New MDI tabbed forms architecture

(New TFormTabsBar Control)



MDI - TFormTabsBar - Demo

☑ HideMinimizedForm
☑ ShowTabsMenuButton
☑ TabOptions.ShowCloseButton
☑ TabOptions.ShowHintForTrancatedCaption
☑ TabOptions.Draggable
☑ TabOptions.MarkInvisibleForm
☑ TabOptions.ShowFormSystemMenu
☑ TabOptions.ShowFormIcon

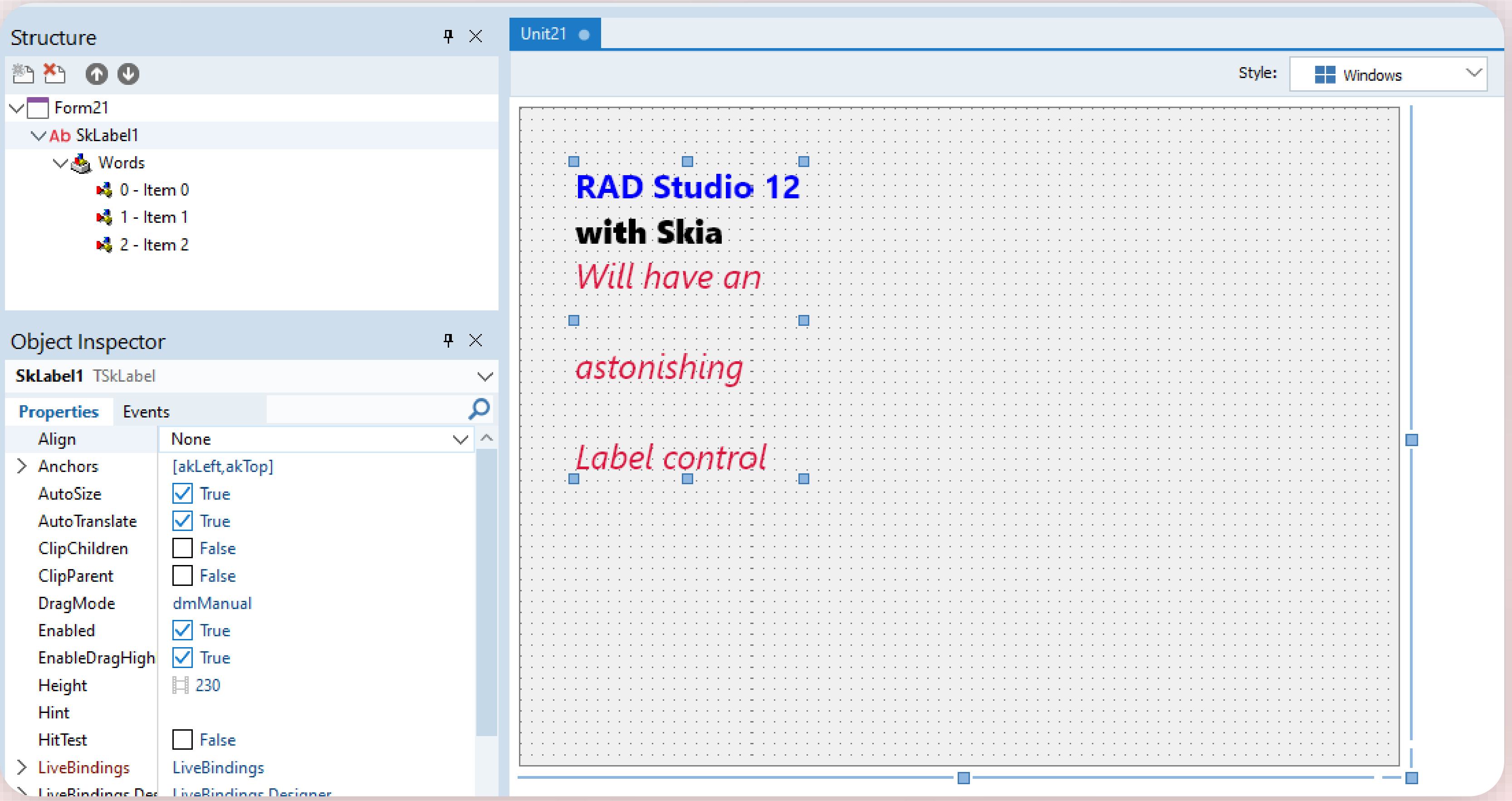
Type to change caption...
Form4

□ CheckBox1

*** Features are not committed until completed and GA released*

Skia support for all platforms

https://skia.org/



Structure

- Form21
  - Ab SkLabel1
    - Words
      - 0 - Item 0
      - 1 - Item 1
      - 2 - Item 2

Object Inspector

SkLabel1 TSkLabel

Properties | Events

Align	None
Anchors	[akLeft,akTop]
AutoSize	☑ True
AutoTranslate	☑ True
ClipChildren	□ False
ClipParent	□ False
DragMode	dmManual
Enabled	☑ True
EnableDragHigh	☑ True
Height	230
Hint	
HitTest	□ False
LiveBindings	LiveBindings
LiveBindings Des	LiveBindings Designer

Unit21

Style: Windows

RAD Studio 12
with Skia
Will have an

astonishing

Label control

For both in C++Builder and Delphi FireMonkey, but also VCL

Leveraging the Skia4Delphi open-source project

But including additional capabilities not found in the open-source project

- Skia API: Access to the pure Skia library, through a single unit: Skia.pas or Skia.hpp
- Controls (for both FMX and VCL): TSkAnimatedImage, TSkLabel, TSkPaintBox, and TSkSvg
- App Render: Replacement of FMX graphics engine by Skia

Delphi Support for Android API 33

Android API Level 33 required for new apps published on Google Play Store starting August 31st

- It's possible (but far from easy) to configure Delphi (11.3) to target a different API level

RAD Studio Yukon Beta offers:

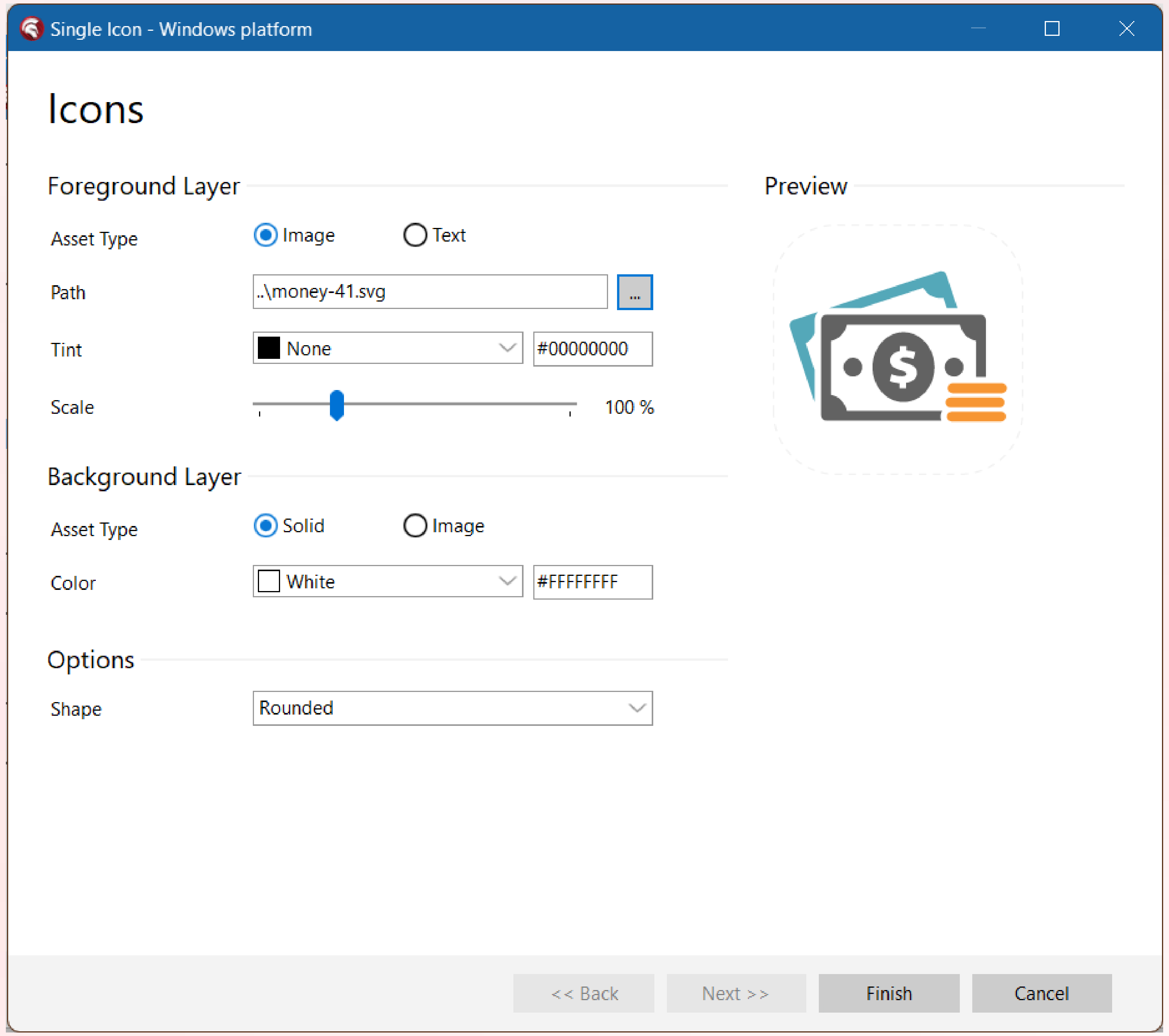
- Full support for Android API level 33
- Legal permission to deploy apps built with the beta

Delphi Support for Android API 33

- We added support for the new Android Splash Screen standard
- Upgraded Android in-app purchases support to depend on the latest version of the Google Play Billing library (6.0.1)
- Yukon includes support to create mobile apps that use only a portion of the available screen (split screen), a feature specifically useful on tablet devices with a large screen surface
- We are still working to add support for the Android Scoped Storage model

All Platform Single Icon, Adaptive Icon and Splash

- The Single App Icon Wizard is a comprehensive tool integrated within the IDE
- Generates icons and splash screens for user applications across multiple platforms
- Enter the SVG of the icon (only the foreground) and configure the background color and shape
- Support for the Android Vector Drawable format, which allows for creating scalable and responsive icons and splash screens specifically for Android devices



Single Icon - Windows platform

Icons

Foreground Layer

Asset Type ● Image ○ Text

Path ..\money-41.svg

Tint None #00000000

Scale 100 %

Background Layer

Asset Type ● Solid ○ Image

Color White #FFFFFFFF

Options

Shape Rounded

FireDAC Security Features

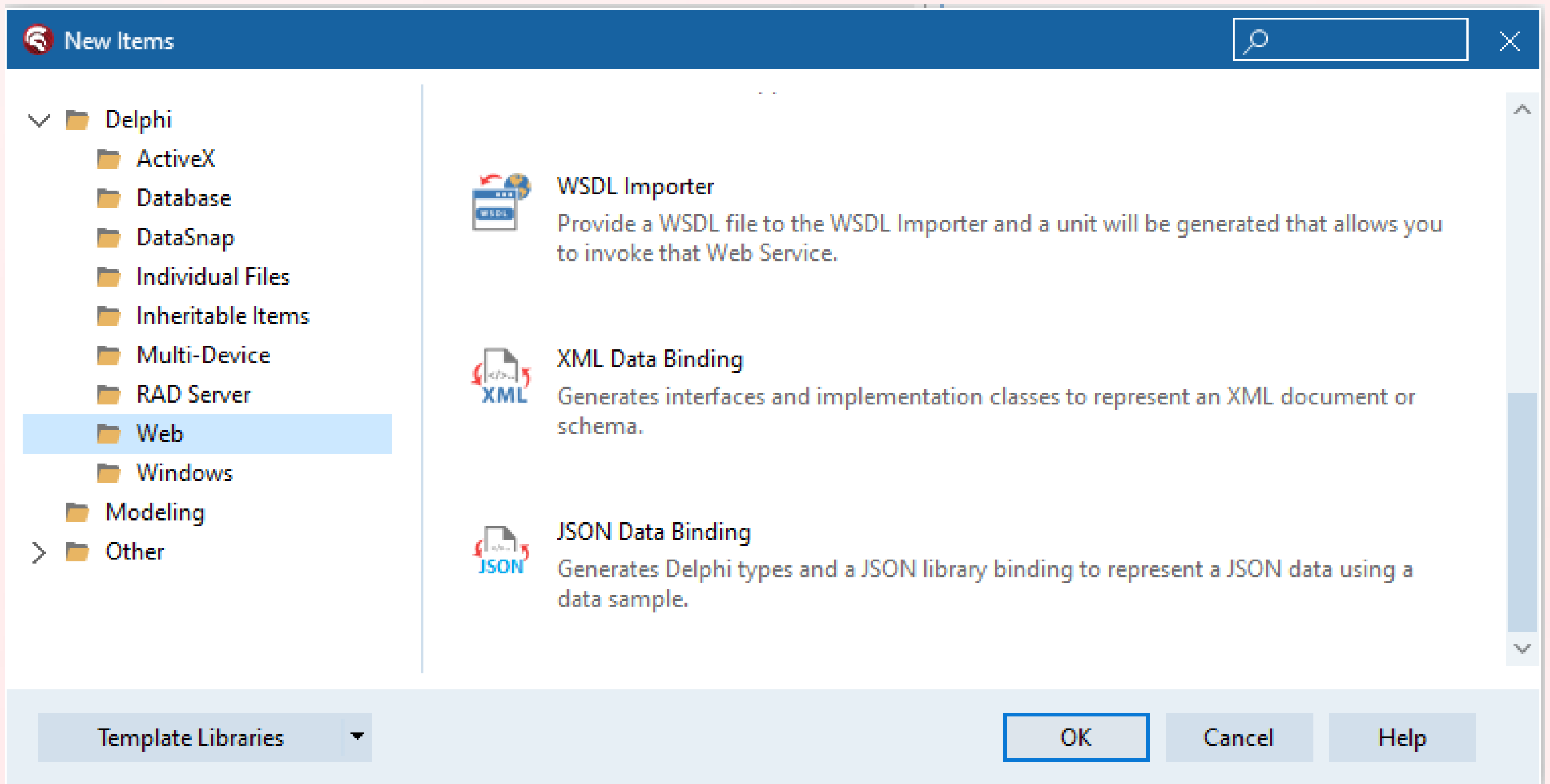
- We are adding some security-related features to FireDAC
  - *AllowedCommandKinds*
  - *AllowMultiCommands*
  - *AllowSQLChange*
  - *ExactUpdatedRecsNum*

- We know that none of these alone will make an application secure, but collectively these features and good overall security practices can contribute to developing more secure applications – remember other features like
  - *Data Execution Prevention (DEP)*
  - *Address Space Layout Randomization (ASLR)*
  - *High-entropy 64-bit ASLR (Only in 64-bit applications)*

- Other features like QBE (Query By Example), IBLite/ToGo for iOS Simulator, SQLite driver update, Decimal128 in MongoDB – still a work in progress

JSON Data Binding Wizard

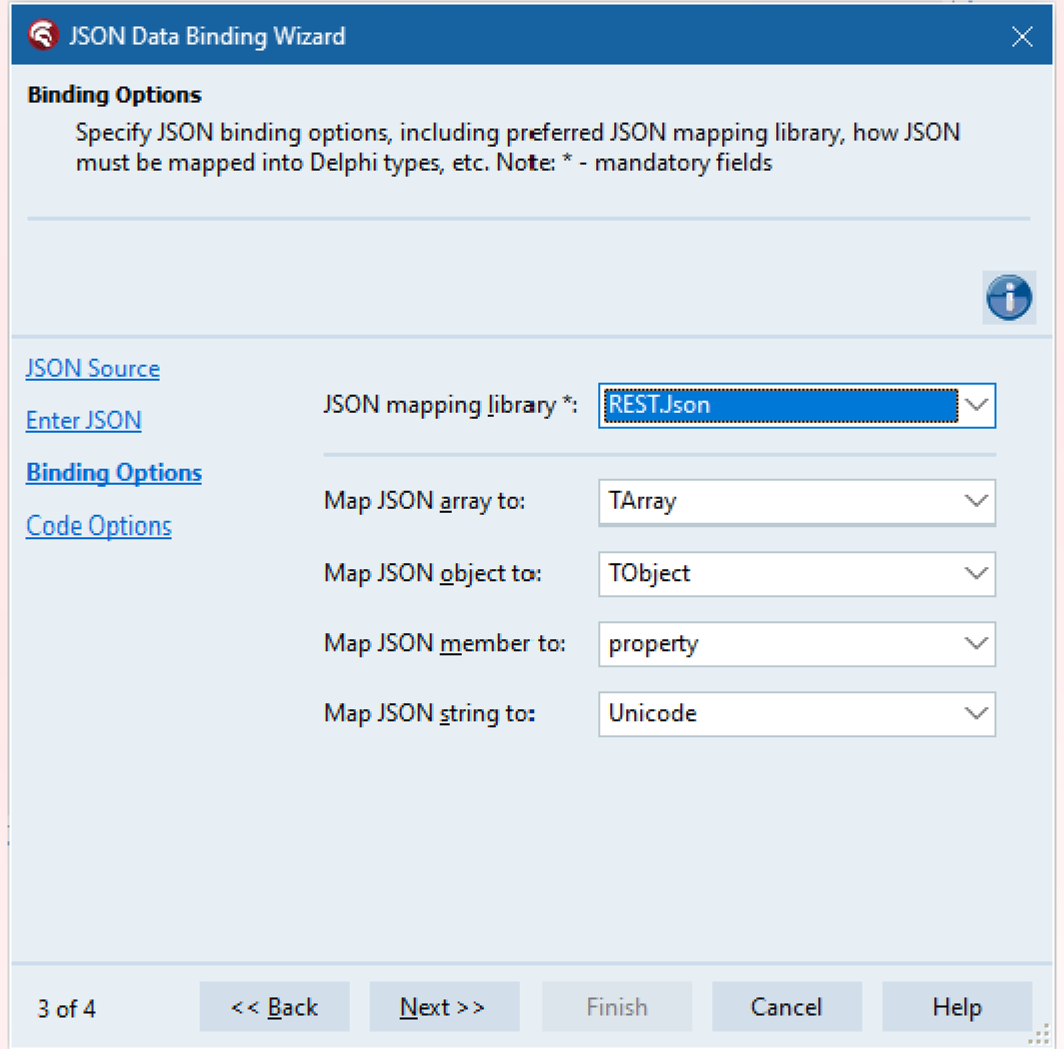
- New Delphi / JSON data binding and mapping wizard
- Allows you to create Delphi data types based on a JSON data structure and map these types to the JSON data using one of the Delphi JSON marshaling and serialization libraries



WSDL Importer
Provide a WSDL file to the WSDL Importer and a unit will be generated that allows you to invoke that Web Service.

XML Data Binding
Generates interfaces and implementation classes to represent an XML document or schema.

JSON Data Binding
Generates Delphi types and a JSON library binding to represent a JSON data using a data sample.



Binding Options

Specify JSON binding options, including preferred JSON mapping library, how JSON must be mapped into Delphi types, etc. Note: * - mandatory fields

JSON mapping library *: REST.Json

Map JSON array to: TArray

Map JSON object to: TObject

Map JSON member to: property

Map JSON string to: Unicode

RAD Studio 12 Beta Resources

- https://blogs.embarcadero.com/whats-coming-in-delphi-and-cbuilder-libraries/
- https://blogs.embarcadero.com/delphi-supports-android-api-33-via-yukon-beta/
- https://blogs.embarcadero.com/yukon-beta-blog-delphi-language-modernizing-string-literals/
- https://blogs.embarcadero.com/multi-device-icon-generator/
- https://blogs.embarcadero.com/clang-v15-compiler-support-coming-to-cbuilder-12/
- https://blogs.embarcadero.com/announcing-the-new-updated-rad-server-technical-guide/
- https://blogs.embarcadero.com/clang-v15-compiler-support-coming-to-cbuilder-12/
- https://corneliusconcepts.tech/delphi-12-more-syntax-highlighting
- https://dalijap.blogspot.com/2023/09/coming-in-delphi-12-disabled-floating.html
- https://delphiworlds.com/2023/09/yukon-is-coming/
- https://corneliusconcepts.tech/delphi-12-coming

Q&A

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RAD Studio 12

Behind the Build

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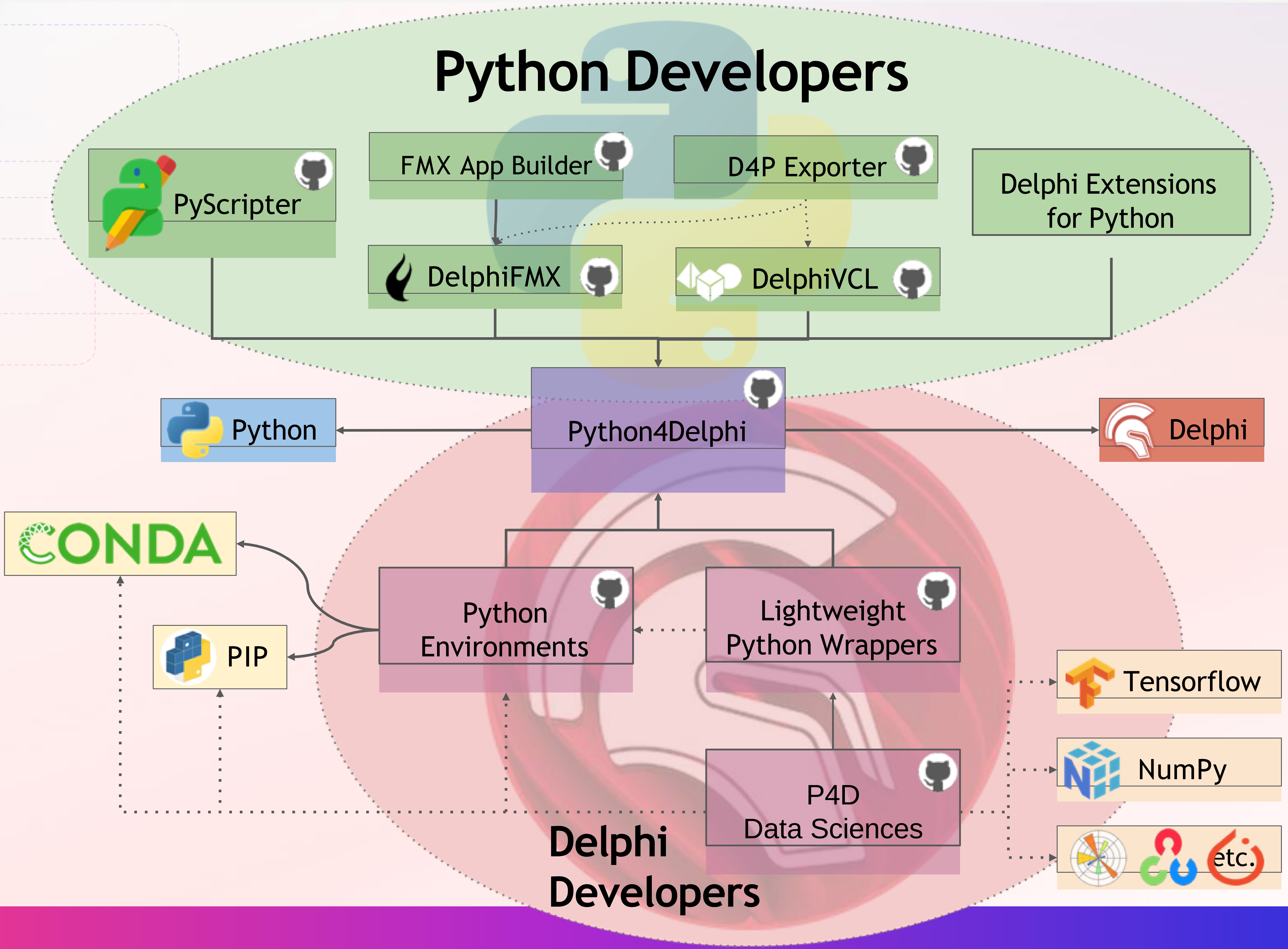
// Embarcadero Python Ecosystem



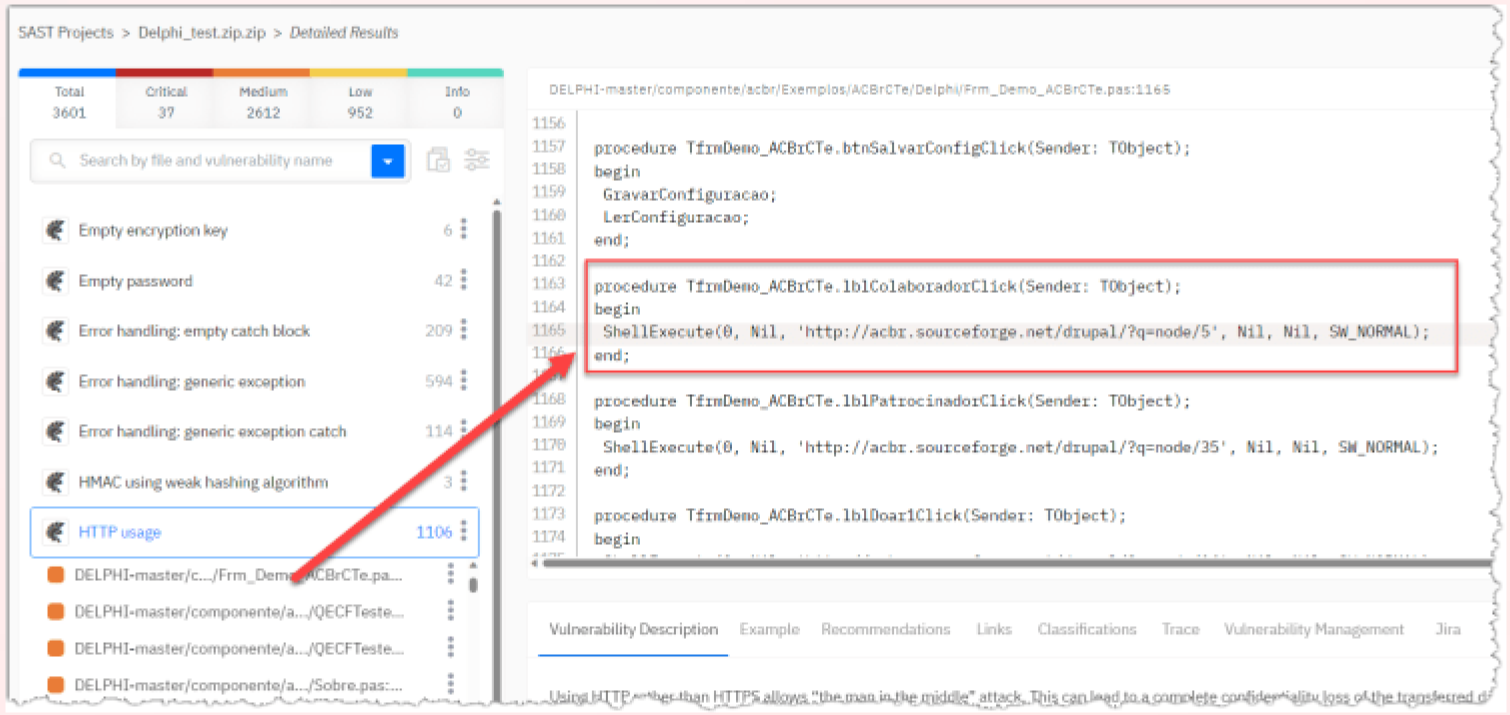
Python and Delphi

- https://github.com/Embarcadero/python4delphi
- https://github.com/Embarcadero/PyScripter
- https://github.com/Embarcadero/PythonEnviroments
- https://github.com/Embarcadero/DelphiVCL4Python
- https://github.com/Embarcadero/DelphiFMX4Python
- https://github.com/Embarcadero/P4D-Data-Sciences
- https://github.com/Embarcadero/PythonPackages4Delphi
- https://github.com/Embarcadero/PythonFMXBuilder
- https://github.com/Embarcadero/Delphi4PythonExporter
- https://github.com/Embarcadero/Lightweight-Python-Wrappers

// Static Application Security Testing (SAST)

sonarDelphi

SonarQube powered static code analysis for **Embarcadero Delphi**



SAST Projects > Delphi_test.zip.zip > *Detailed Results*

Total	Critical	Medium	Low	Info
3601	37	2612	952	0

Search by file and vulnerability name

Empty encryption key	6
Empty password	42
Error handling: empty catch block	209
Error handling: generic exception	594
Error handling: generic exception catch	114
HMAC using weak hashing algorithm	3
HTTP usage	1106

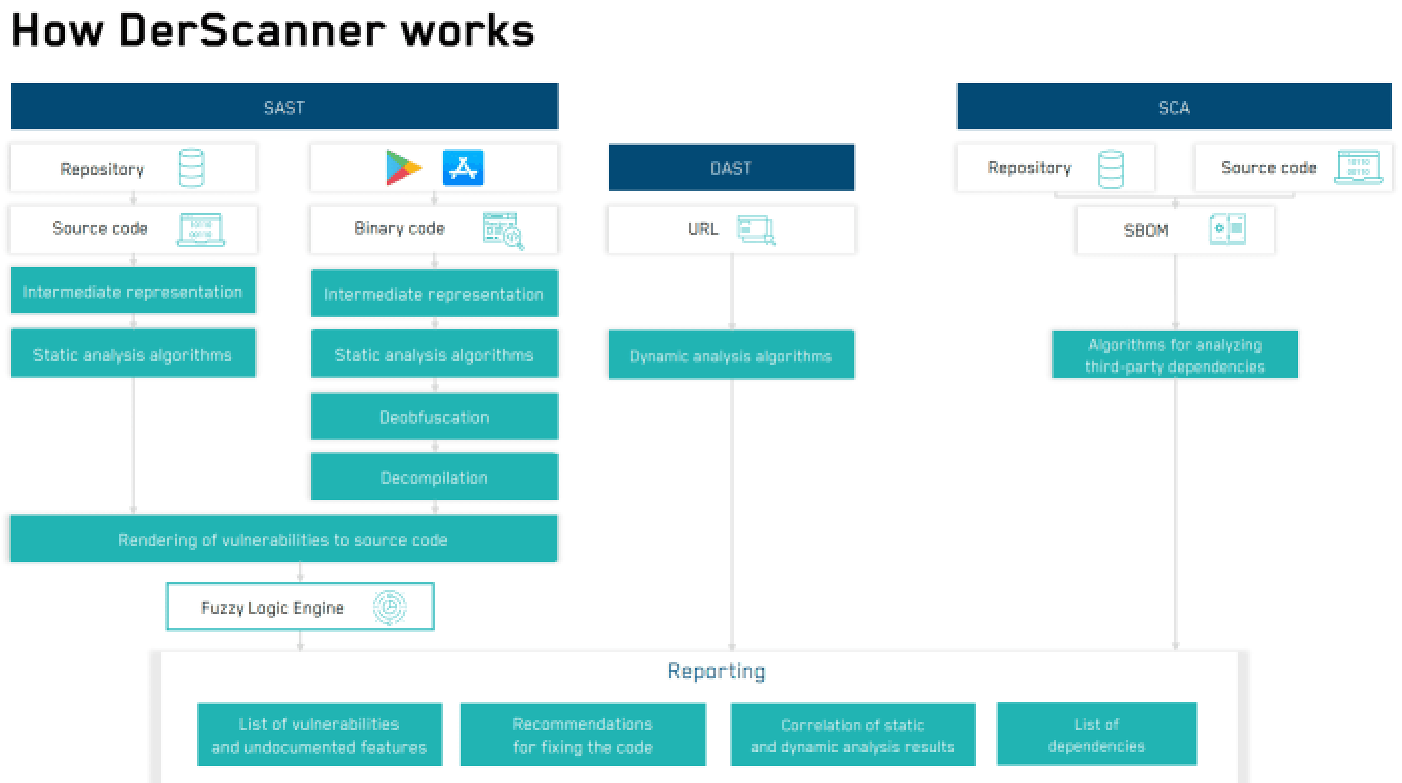
- DELPHI-master/c.../Frm_Demo_ACBrCTe.pa...
- DELPHI-master/componente/a.../QECFTeste...
- DELPHI-master/componente/a.../QECFTeste...
- DELPHI-master/componente/a.../Sobre.pas:...

DELPHI-master/componente/acbr/Exemplos/ACBrCTe/Delphi/Frm_Demo_ACBrCTe.pas:1165

```
procedure TfrmDemo_ACBrCTe.btnSalvarConfigClick(Sender: TObject);
begin
 GravarConfiguracao;
 LerConfiguracao;
end;

procedure TfrmDemo_ACBrCTe.lblColaboradorClick(Sender: TObject);
begin
 ShellExecute(0, Nil, 'http://acbr.sourceforge.net/drupal/?q=node/5', Nil, Nil, SW_NORMAL);
end;

procedure TfrmDemo_ACBrCTe.lblPatrocinadorClick(Sender: TObject);
begin
 ShellExecute(0, Nil, 'http://acbr.sourceforge.net/drupal/?q=node/35', Nil, Nil, SW_NORMAL);
end;

procedure TfrmDemo_ACBrCTe.lblDoar1Click(Sender: TObject);
begin
```

Using HTTP rather than HTTPS allows "the man in the middle" attack. This can lead to a complete confidentiality loss of the transferred d

DerScanner



How DerScanner works

SAST
Repository
Source code
Intermediate representation
Static analysis algorithms
Binary code
Intermediate representation
Static analysis algorithms
Deobfuscation
Decompilation
Rendering of vulnerabilities to source code
Fuzzy Logic Engine
DAST
URL
Dynamic analysis algorithms
SCA
Repository
Source code
SBOM
Algorithms for analyzing third-party dependencies
Reporting
List of vulnerabilities and undocumented features
Recommendations for fixing the code
Correlation of static and dynamic analysis results
List of dependencies

SAST and Delphi

SonarQube

- https://github.com/Embarcadero/SonarDelphi
- https://github.com/DelphiCodeCoverage/DelphiCodeCoverage
- https://www.sonarsource.com/products/sonarqube/

DerScanner

- https://blogs.embarcadero.com/how-secure-is-your-app-static-analysis-finds-security-holes/
- https://derscanner.com/