# RAD Studio 11 Alexandria

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The Landscape

- **Microsoft about to release Windows 11**
  - Fully focused on it, key reason for picking version 11
  - New dev platform is Windows App SDK
    (aka Project Reunion)

- **Transition to ARM also on desktop**
  - Led by Apple with macOS
  - And ARM reigns on mobile platforms

- **Developers on 4K**
  - High resolution and multi screen are common for developers
  - Growing also for end users
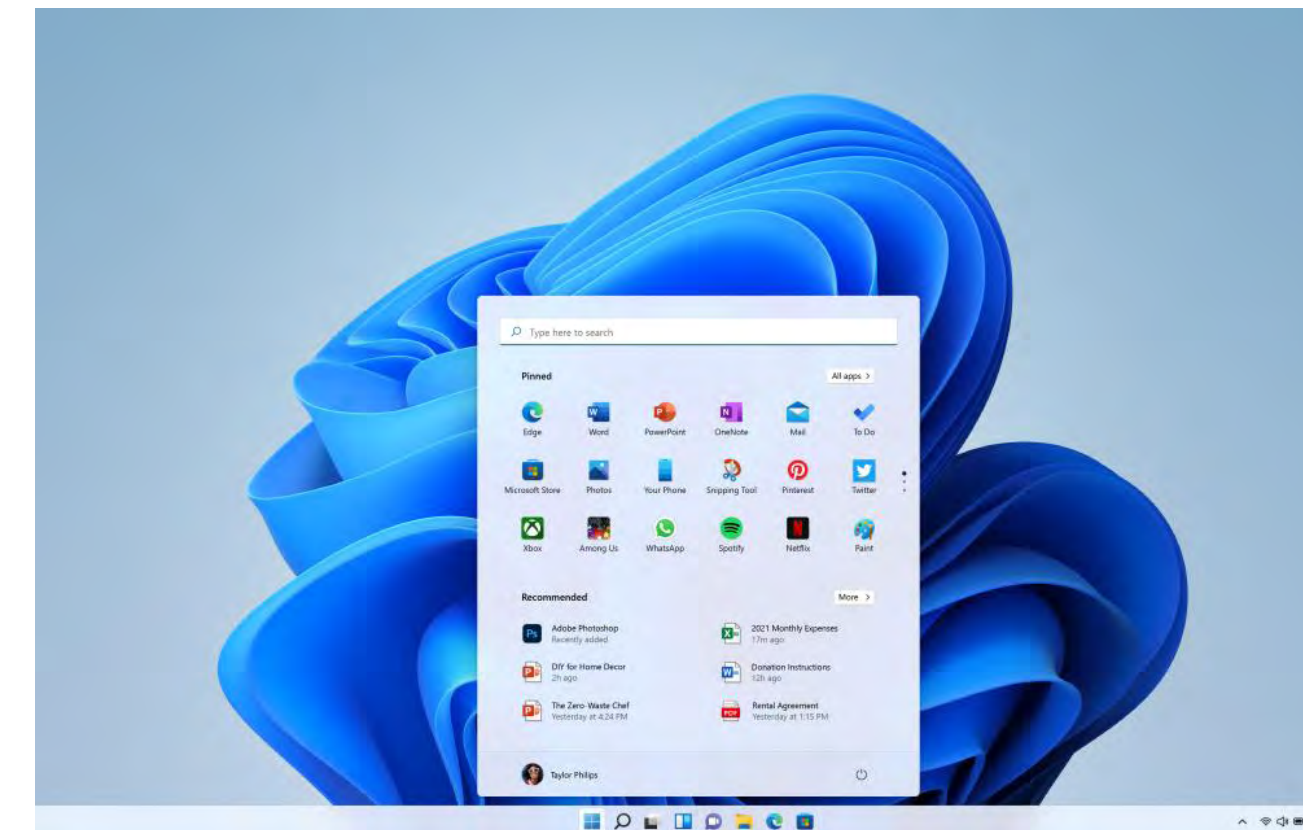
RAD STUDIO 11

What's Great in RAD Studio

Developer Productivity - Shipping is a feature. Get to market 5x faster with Delphi and C++Builder

Fast Native Apps - With native compilers, RAD Studio gives your apps the speed they need

Database Access - Key to Delphi's initial design, database access is integral to RAD Studio

Powerful C++ Libraries - Hundreds of C++ libraries can be used in C++Builder or Delphi in RAD Studio

Platform API Access - Gives you access to all the platform APIs on all platforms

Visual Designers - Forget prototyping in another tool, just design it and finish it in the RAD Studio IDE

Strong Community - Full of Technology Partners, MVPs, trainers, authors and developers

Backward Compatibility – You have an investment in your code, RAD Studio keeps that relevant

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Recent RAD Studio Features

- IDE
  - Dark theme and full styling support
  - Delphi redesigned Code Insight with LSP
  - Reworked offline installation experience
  - MSIX support

- Extensive VCL work
  - High DPI, High DPI styles, per-control styling
  - Additional components: TControlList, TNumberBox and TEdgeBrowser

- C++ Win64 extensions
  - New 64-bit Debugger
  - C++ Exception Handling and STL Improvements

- FMX and Multi Device
  - macOS 64-bit Intel support (Delphi)
  - Support for the latest iOS and Android (Delphi)
  - Apple Metal GPU driver support
  - FireMonkey Low Code App Wizard

I. RAD Studio 11 IDE
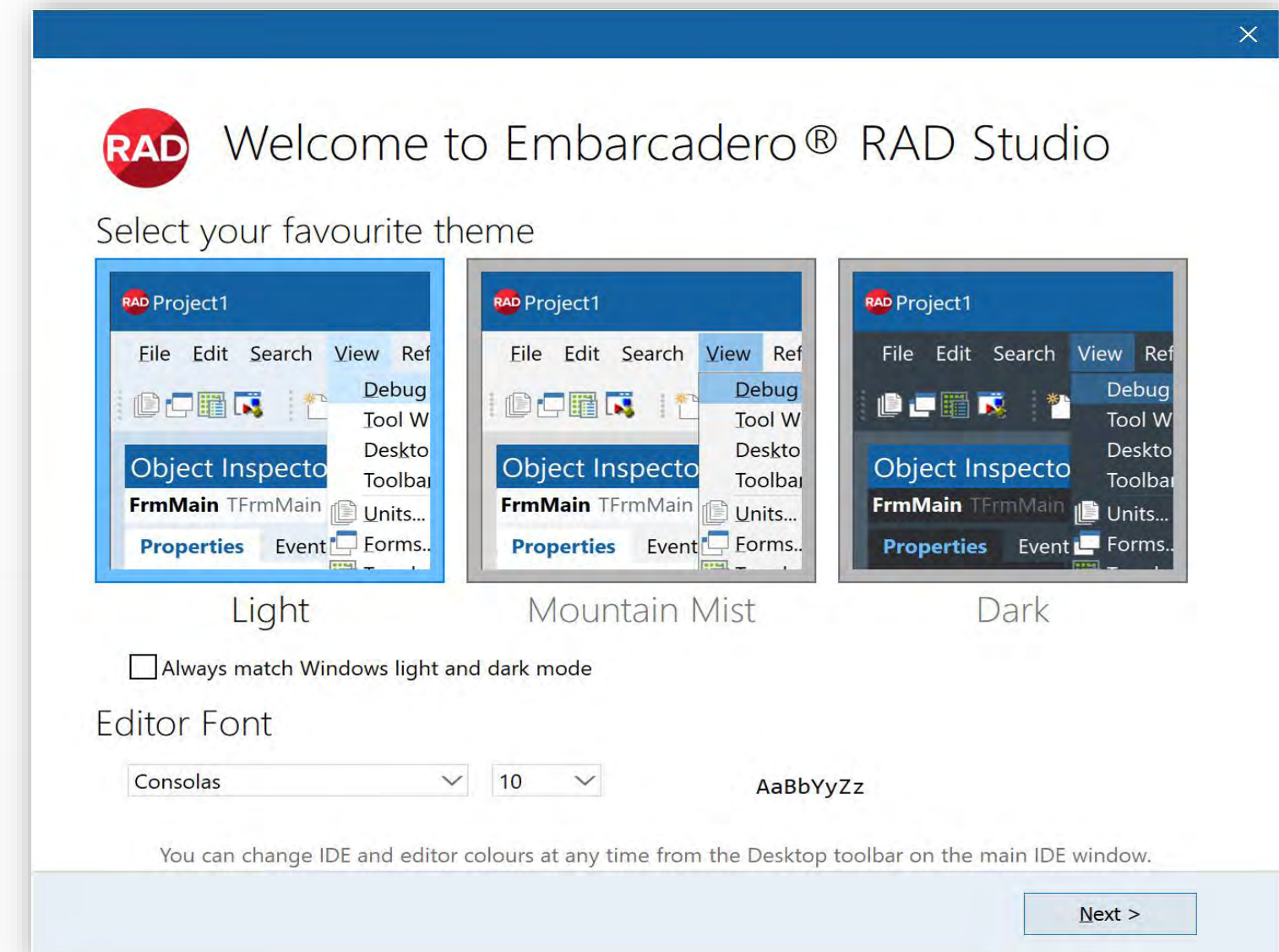
High DPI IDE

- Crisp fonts in all windows, and editor

- Based on VCL PerMonitorV2 support and High-DPI support for styles

- All new set of IDE icons (with multiple resolutions), IDE uses the image collection and virtual image list components

- ToolsAPI: new interfaces for APIs that use images
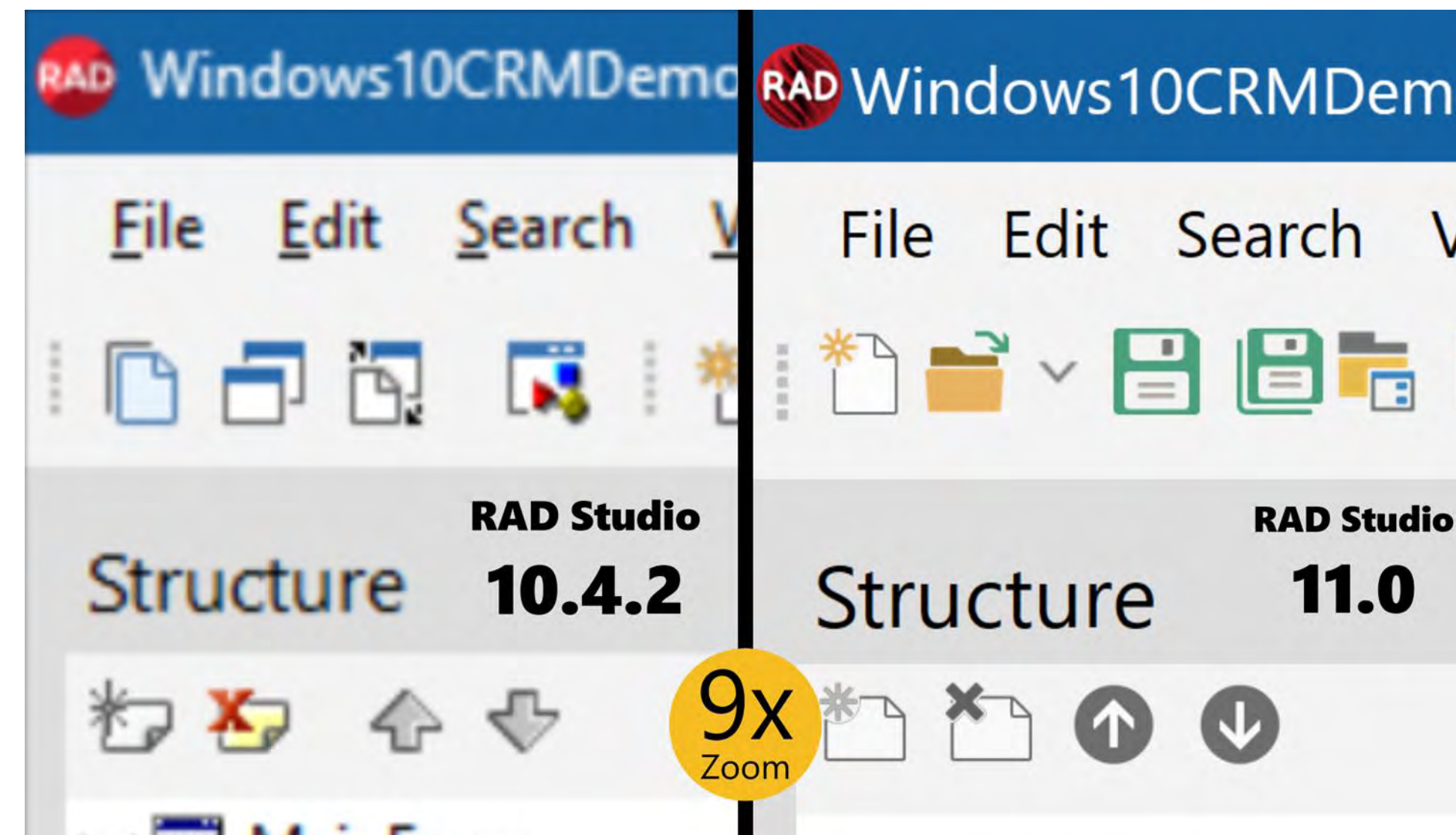
High DPI enabled form designer

- Forms, frames, and data modules

- Designer can use low (96) DPI, your current DPI, or a custom DPI (set in Options dialog). Default is low

- DPI is saved in the DFM, and form scaled at runtime
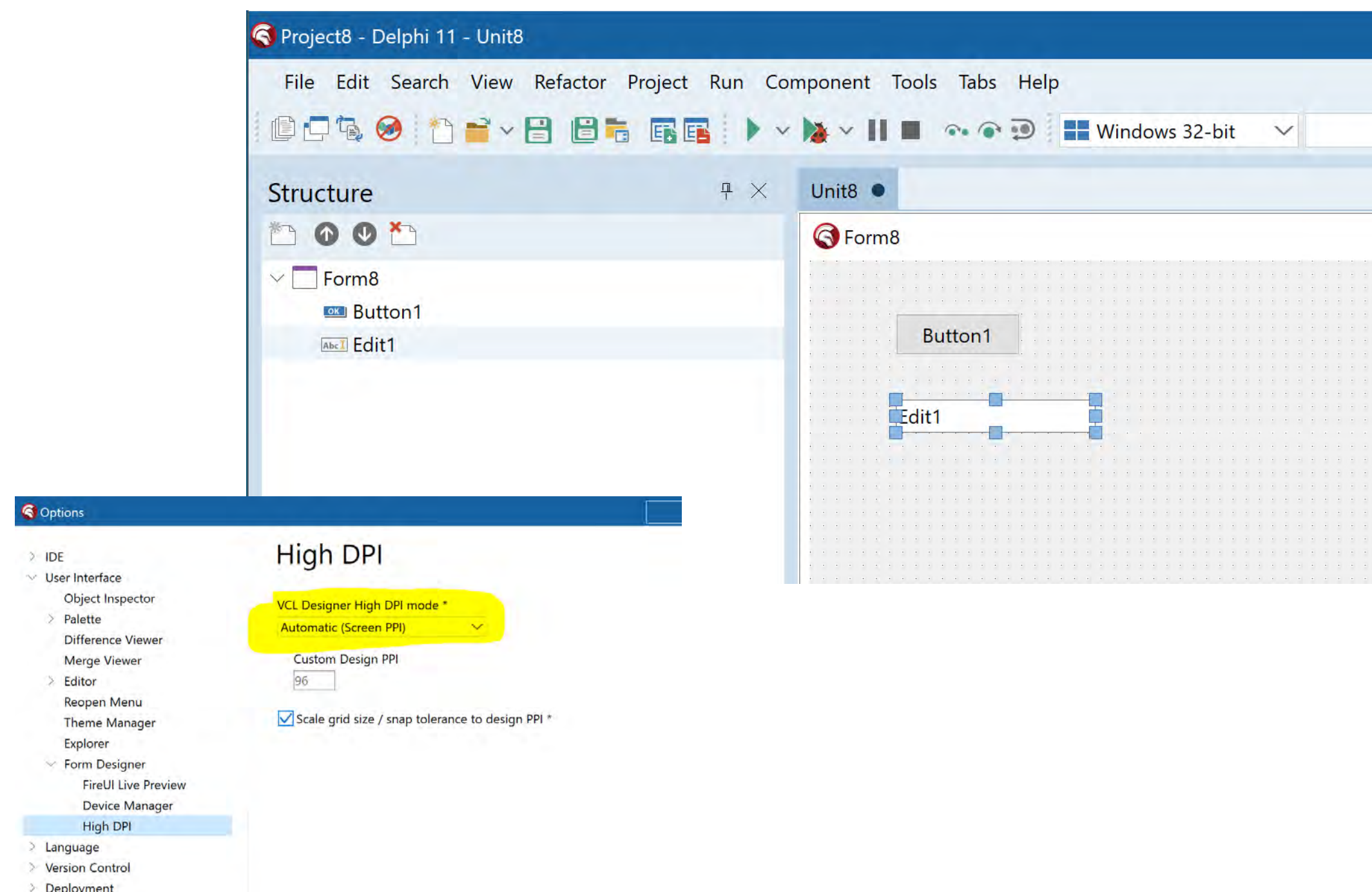
Active styles in VCL designer

- For styled applications, pick a native style (for each form or control) and preview at design
- Also Win10 styled window frame
- Not enabled by default
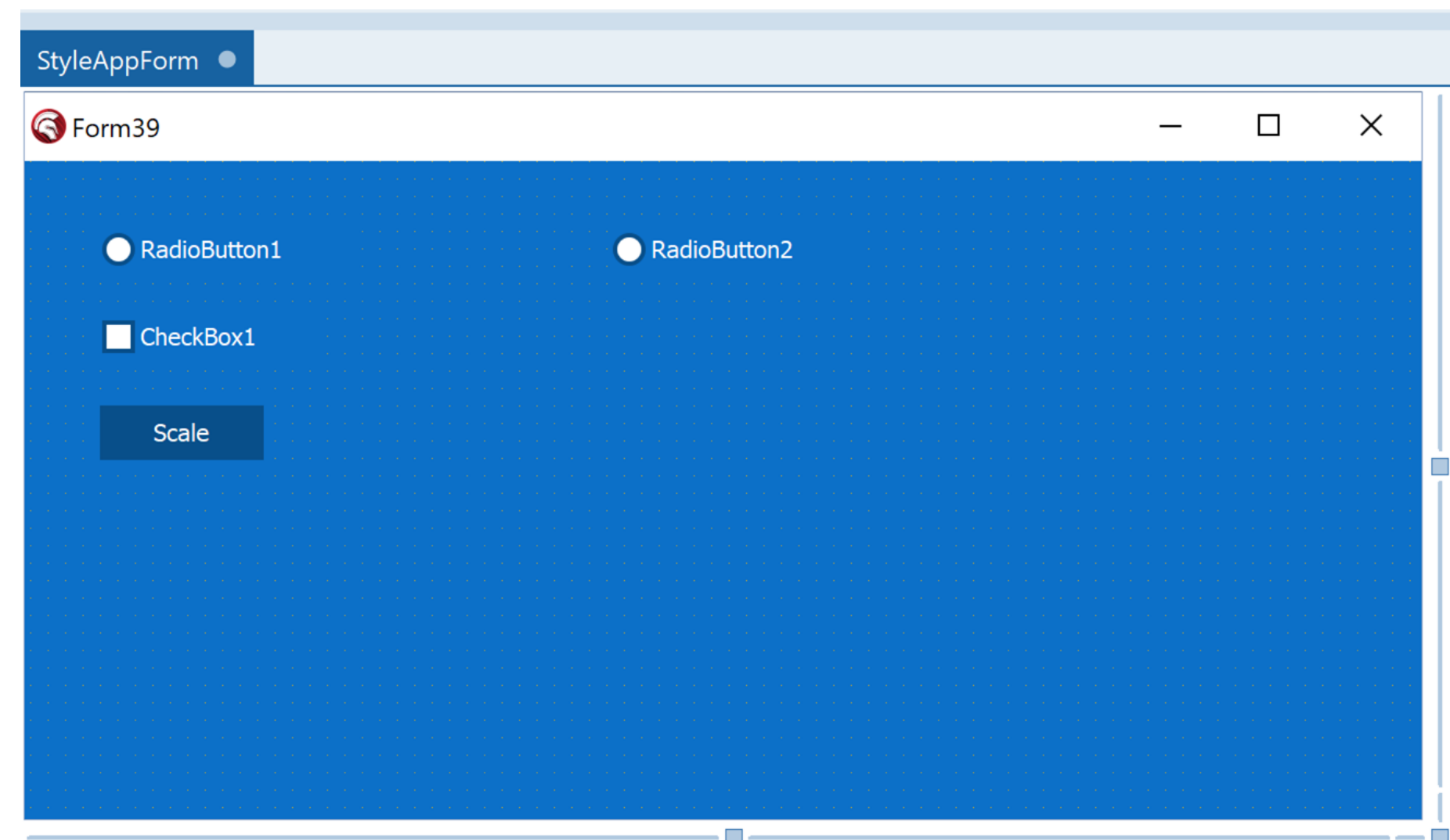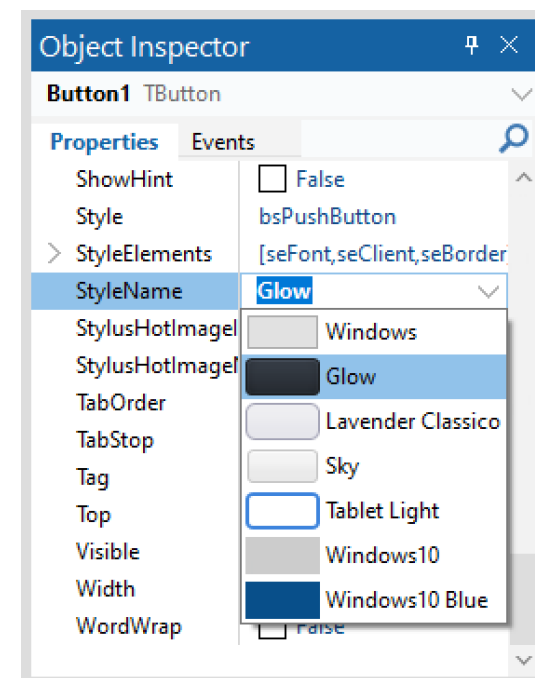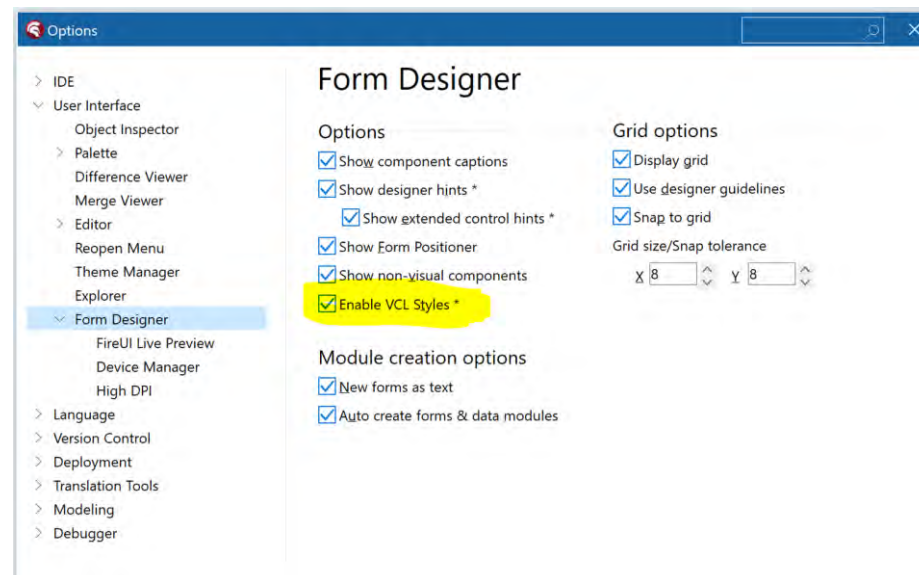
More in RAD Studio IDE

- FMX designer enhancements
  - Hints and guidelines

- Delphi LSP quality improvements

- New C++ code formatter
  - Based on clang-format
  - (Optional) format on save or as you type (on Enter)

- Consolas is the new editor font, plus additional fonts shipped

- Many fixes to multi-window support, including design & code at the same time
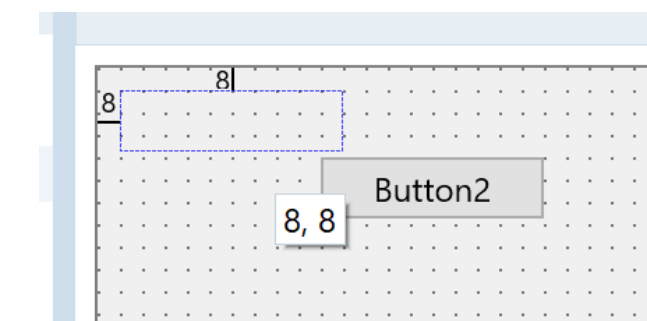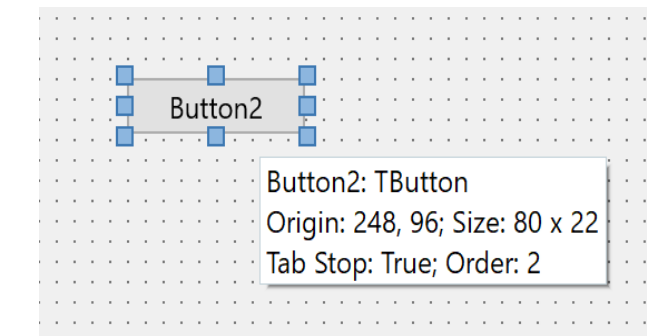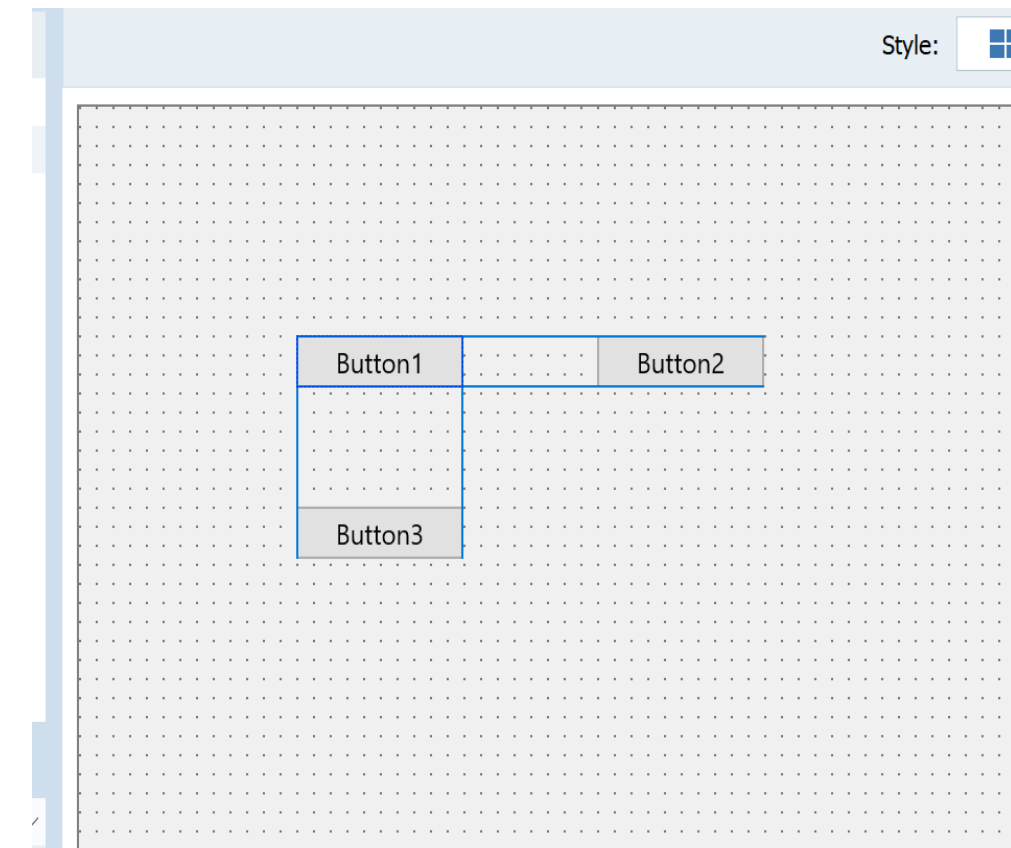
New Welcome Page

- New native Welcome page, VCL based and flexible - Similar content as today
- Plugin architecture, to be made open in the future for third-party plugins
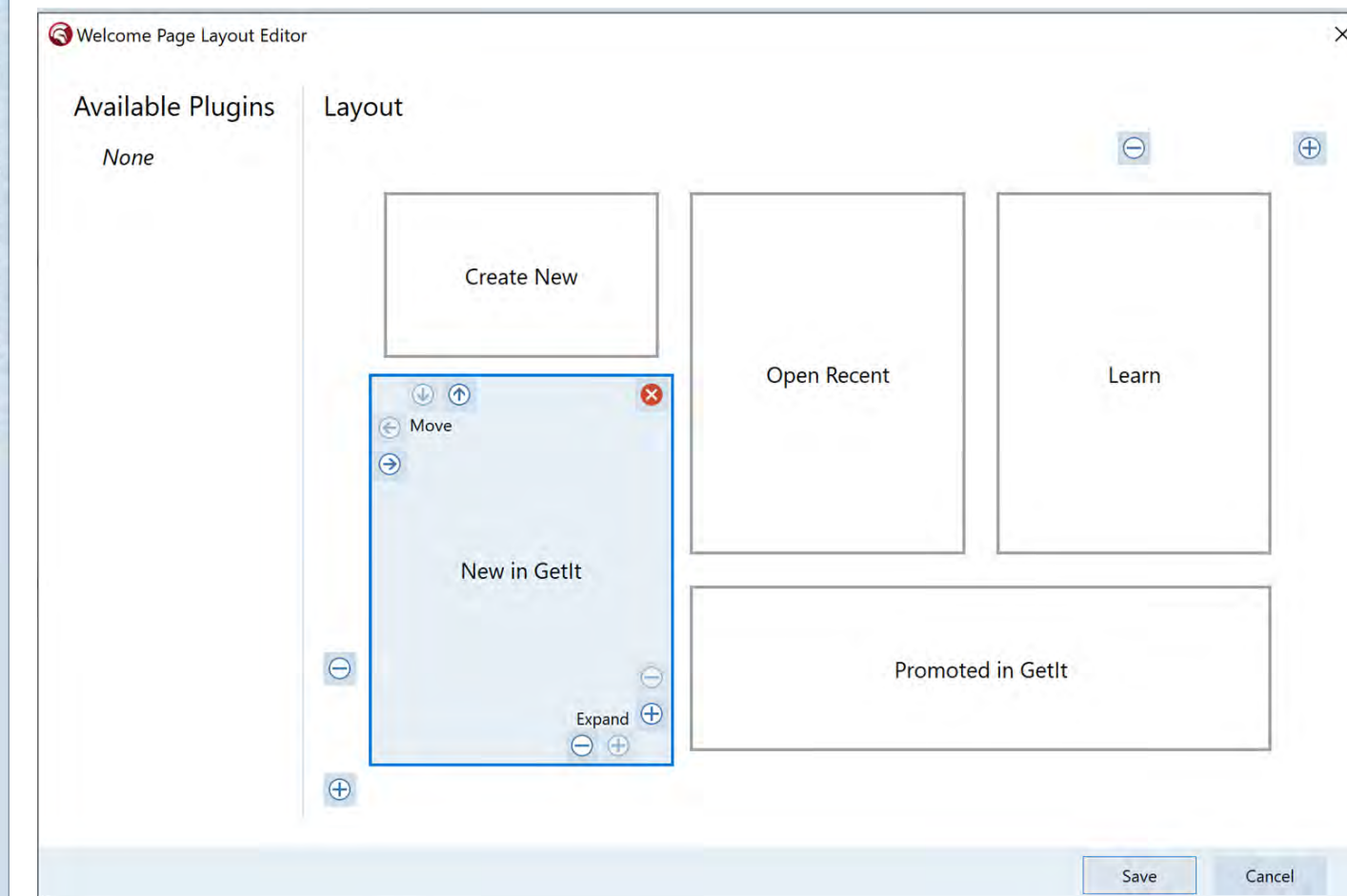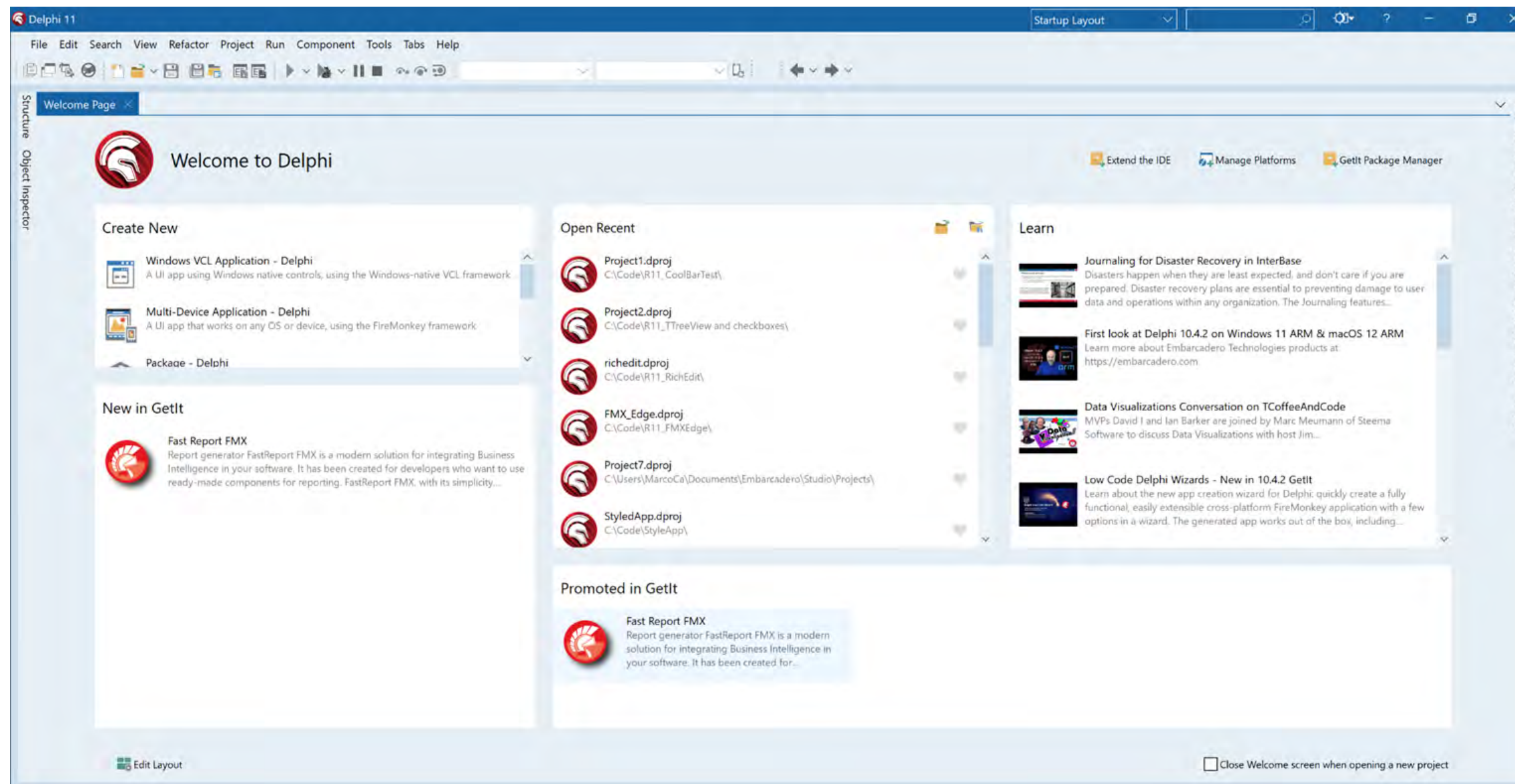
Visual Studio Code Delphi LSP Support

- VSCode plugin to use DelphiLSP
  - Will be in the Visual Studio Marketplace
  - Windows only

- Allows customers to use another editor, with code tooling

```
procedure TForm1.FormCreate(Sender: TObject);
begin
  //
  var Hello : string := 'Hello from VSCode';
  Caption := He
end;                abc Hello
```

Installer

- Minimal installer improvements
  - High DPI UI
  - Initial Language selection (rather than detection)
  - Ability to specify a custom Catalog Repository folder

- Feature Installer
  - Some done operations in parallel, for faster installation
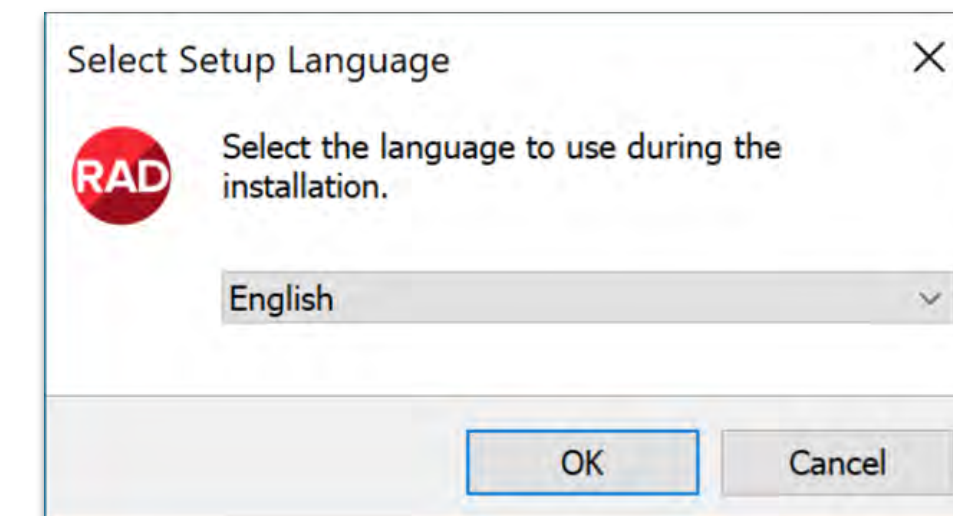
II. C++ and Delphi Languages

C++ Quality work

- Focus on RTTI (for components)
  - Delphi-style RTTI for C++ components allows using Clang-built components in-IDE
  - C++-style RTTI for Delphi types available to Clang
  - typeid() for Delphi-style types works

- Exception handling: further work following 10.4.2's: complex scenarios passing

- C++/Delphi interop improvements
  - std::string_view for Delphi strings
  - String assignment
  - String conversion methods for Delphi types

- CMake: revision of functionality and packages it can handle

Delphi

- New macOS 64-bit ARM target platform
  - For Apple Silicon M1 and beyond
  - Includes toolchain and signing support
  - Universal binary (package Intel + ARM)

- Minor language enhancements
  - Binary literals and digit separator support
  - Inline assembler support for AVX instructions (AVX-512)

- Further compiler performance optimizations
  - Mostly already delivered in 10.4.2 and patches

```
procedure TForm5.Button1Click(Sender: TObject)
var
  x: Integer;
begin
  x := 1_000_000;
  ShowMessage (x.ToString);

  x := %1010101;
  ShowMessage (x.ToString);
end;
```

III. RAD 11 Libraries Quality & Improvements
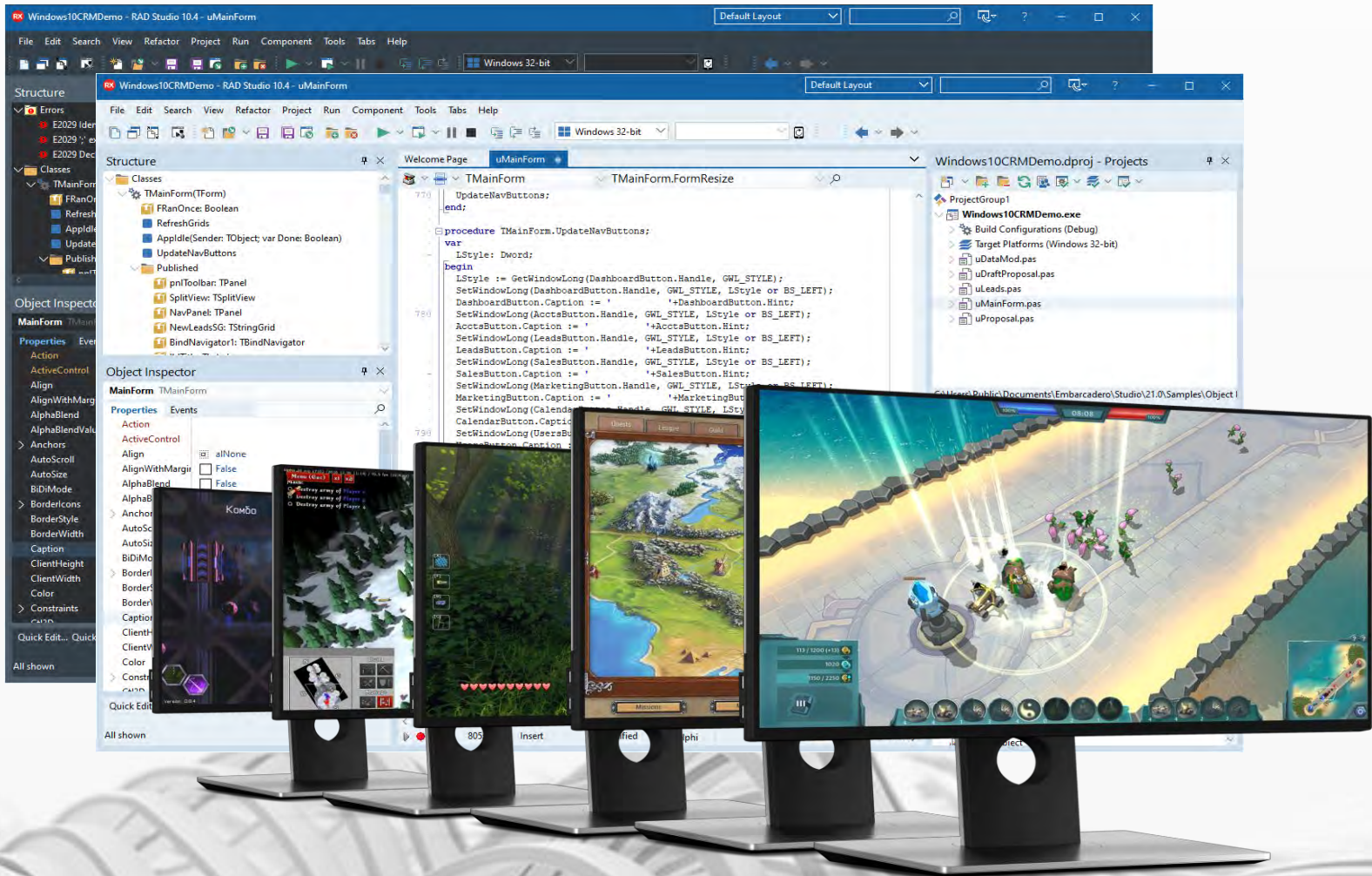
VCL Modernization work

- "New" RichEdit implementation (RichEdit 4.1 via MSFTEDIT.dll)
  - Including URL detection, transparency, spell checking
- Large collection of small improvements focused on removing XP legacies and improve core features
  - TreeView checkboxes
  - Smaller: nsDropHilited, Coolbar Chevron, mouse wheel, button category gutter, TWICImage multi frame, default form size, SetSelText Undo, default form font, exception dialog copy button… too many to list here
- VCL Quality
  - Remote desktop improvements for VCL and IDE
 - New TDBLabeledEdit component
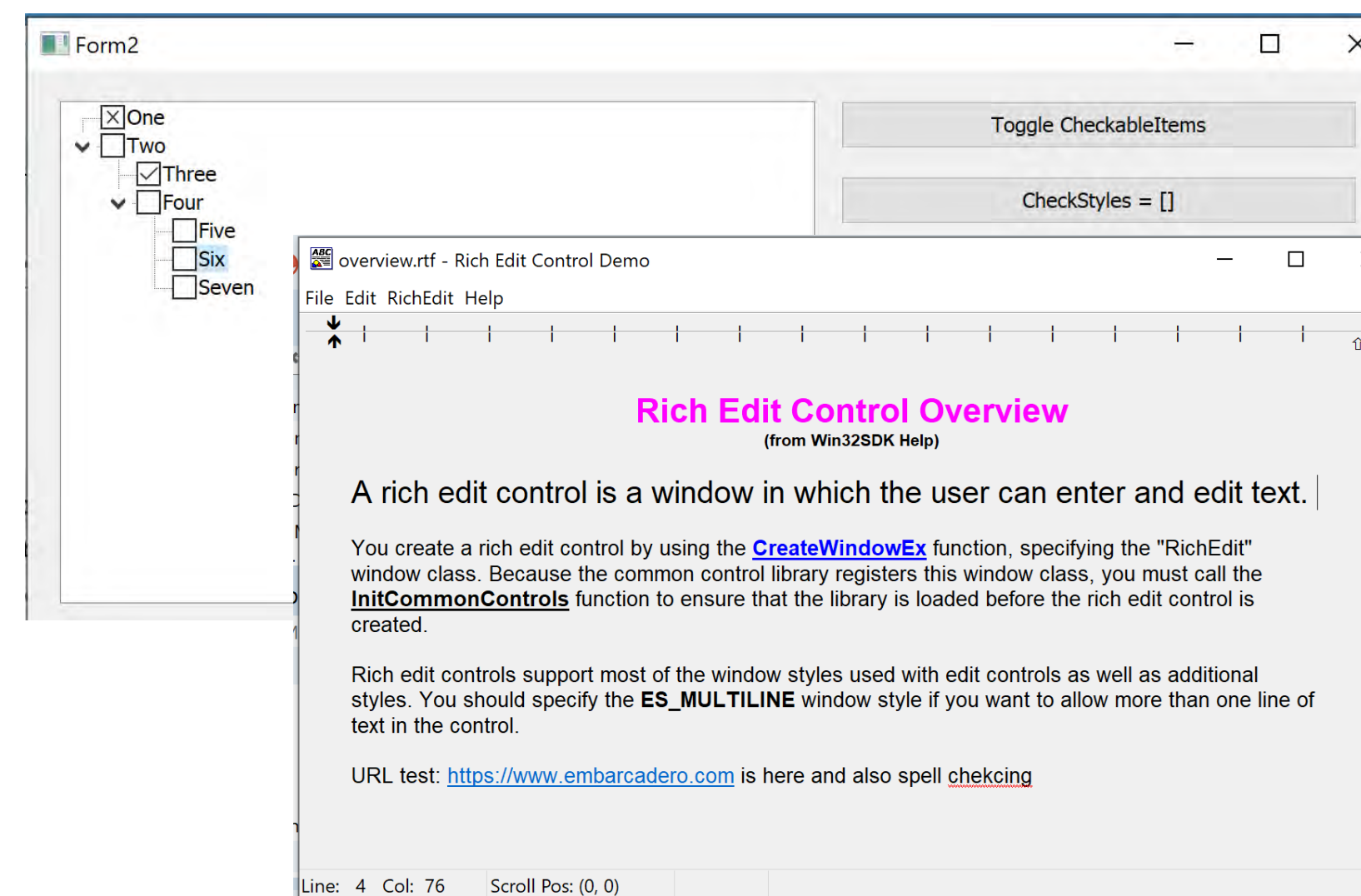
FireMonkey

- Better FMX Windows and desktop integration
  - Platform services for macOS and Windows refactored into separate units
  - IFMXSaveStateService, IFMXDeviceService, IFMXVirtualKeyboardService, IFMXTimerService, IFMXLoggingService, IFMXMenuService, FMX.Platform.Metrics.*
  - Firemonkey Accessibility Pack Integration
- FireMonkey Windows High-DPI improvements
  - From pixels to device independent units (PX to DP)
  - Extended IFMXMultiDisplayService
  - Delivers much higher UI quality on Windows High DPI monitors
- Target Android API 30
  - Related requirements for AndroidX, in-app purchases, matching Play Store requirements
  - Multiple classes.dex files, simplifying integration of external Android dependencies

FMX TWebBrowser with Edge

- WebView 2 (Chromium Edge) implementation of TWebBrowser on Windows
  - Compare website rendering:
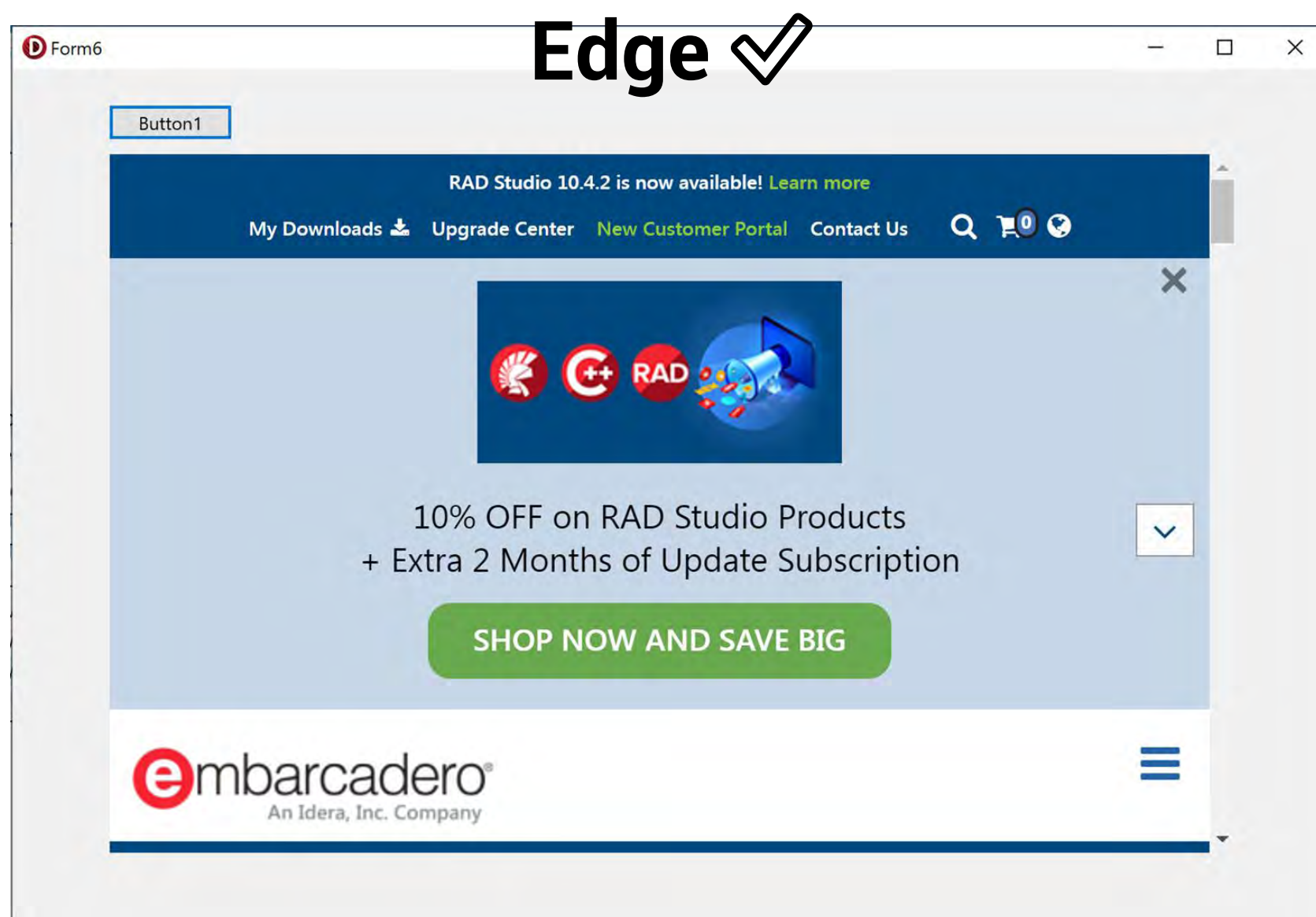
(Delphi) RTL & Data Improvements

- TZipFile (including Zip64, files deletion, quality improvements and optimizations)

- Large data structures (and 64-bit) improvements

  - Lists, large stream operations, dictionary improvements for hashing and capacity

- Record helpers for TDateTime and TCurrency, UTCNow function

- New core classes: TNoRefCountObject and TPointerStream

- Bluetooth LE quality (for most platforms)

- Performance optimizations and RTTI improvements (open array support)

- PPL Thread pool statistics

- FireDAC: offers specific improvements for the PostgreSQL, Oracle, and Firebird databases

HTTP, REST, Cloud, Multitier

- Web Technologies
  - HTTP Client Library: Windows support for HTTP / 2
    - New property THttpClient.ProtocolVersion
  - CustomContentType in RestRequest
  - TCertificate.PublicKey
  - DataSnap: Configurable REST URI to methods mapping
  - Base64url encoding

- RAD Server
  - Multipart/form-data support
  - New TRESTRequestDataSetAdapter component for uploading datasets to RAD Server
  - RAD Server Lite: Embeds IBToGo, easy to deploy, unlimited deployment, limited throughput

Quality Overall

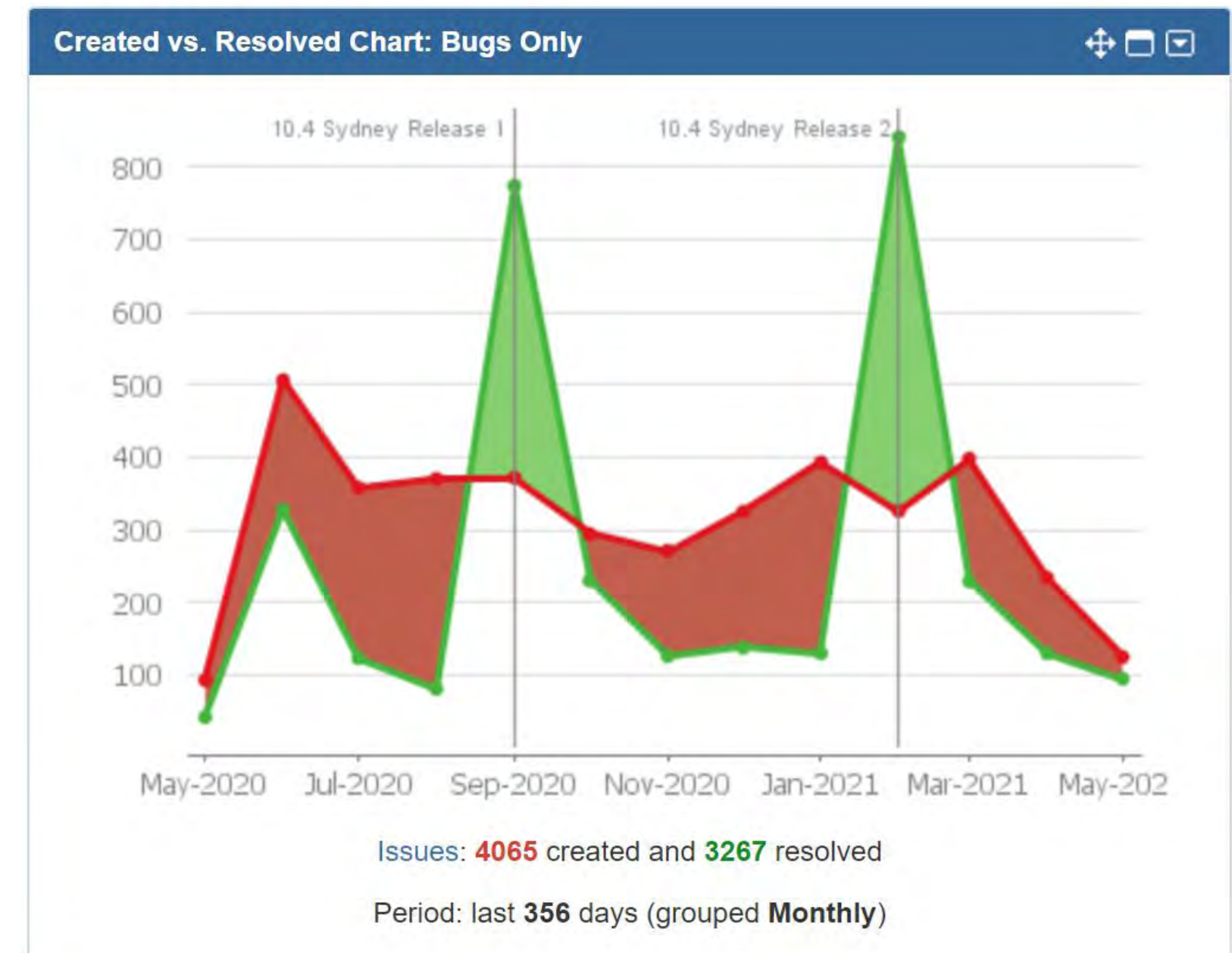Customer reported QP issues *fixed* *

    New Features: 115

    Bugs: 670

Total QP issues addressed (*any resolution*) *

    New Features: 150

    Bugs: 920

* *Estimate, pending final testing on a few issues*

Created vs. Resolved Chart: Bugs Only

10.4 Sydney Release 1   10.4 Sydney Release 2

Issues: **4065** created and **3267** resolved

Period: last **356** days (grouped **Monthly**)

RAD STUDIO 11

RAD 11 Summary

I. Large Focus on IDE
- IDE High DPI and High DPI enabled form designer
- VCL styles in VCL designer; improvements to FMX designer and Multi-window design/code for a unit
- LSP quality and new C++ code formatter
- New Welcome page
- Visual Studio Code LSP support
- Minimal installer improvements

II. Delphi and C++ compilers and toolchains
- C++ Quality: RTTI (components); exception handling
- Delphi macOS 64 ARM (M1) compiler and toolchain
- Minor Delphi language improvements

III. Libraries Improvements
- Delphi RTL quality: TZipFile, 64-bit data structures, Bluetooth LE
- VCL Modernization work
- Better FMX High DPI on Windows and desktop integration, including WebView 2
- Android API 30 support and related work

- Additional Delphi Supported Platforms
  - Support for WSL 2 (Windows Subsystem for Linux)

Q&A