

modernize



with  embarcadero

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<https://embt.co/Windows10ModernizeWebinarSeries>



11:00 AM - 12 PM CDT

Windows 10 and New Key UX Principles (for RAD Studio Developers)

Sarina DuPont, Director of Product Management, Embarcadero



11:00 AM - 12 PM CDT

Enterprise Connectors Spotlight: MailChimp and Cassandra

Jim McKeeth, Embarcadero Chief Developer Advocate & Engineer



11:00 AM - 12 PM CDT

Fast migration to Windows 10 HighDPI with FastReports

Den Zubov, Lead Developer, Fast Reports

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11:00 AM - 12 PM CDT

Windows 10 - Modernization with RAD Studio and TMS Software

Holger Flick, TMS Software



11:00 AM - 12 PM CDT

FireDAC for Windows 10 Database Access

Jens Fudge, Delphi Enthusiast, MVP, speaker, and trainer



11:00 AM - 12 PM CDT

Enterprise Connectors Spotlight: Gmail and Bing Search

Olaf Monien, CEO Developer Experts, Embarcadero MVP

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11:00 AM - 12 PM CDT

Building native apps for Windows: why it matters?

Serge Pilko, Embarcadero MVP



11:00 AM - 12 PM CDT

A tale of 3 APIs: VCL integration with WinAPI, COM & ShellAPI, WinRT

Marco Cantu, Embarcadero Product Manager



11:00 AM - 12 PM CDT

Top Windows 10 features you can add to your VCL applications

Ian Barker, Embarcadero MVP

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Build  Windows 10 Applications

Fast migration to Windows 10 HighDPI with FastReports



Den Zubov, Lead Developer, Fast Reports

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Why HiDPI ?

UHD monitors



Laptops



Why HiDPI ?

Surround with different monitors



DPI Awareness modes

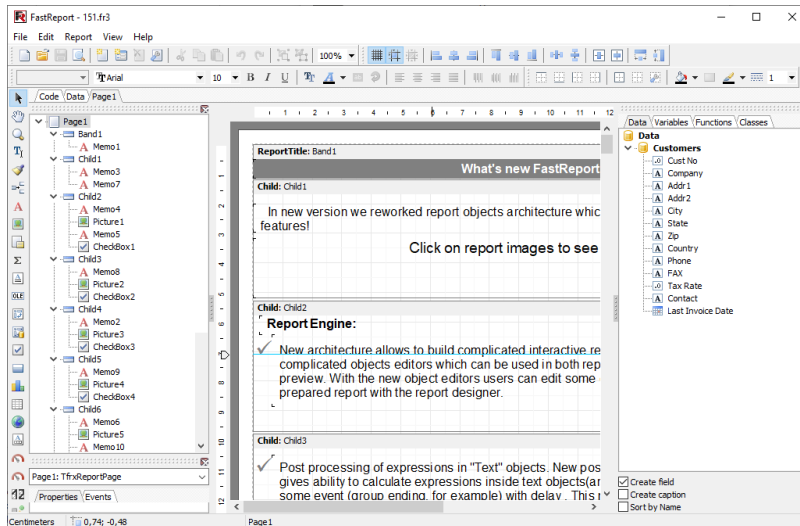
DPI Awareness Mode	Windows Version	Behavior
Unaware	N/A	All displays are 96 DPI(stretched image)
System	Vista	Application uses DPI of primary display(DPI can be changes only after log off)
Per-Monitor	8.1	The DPI of the display that the application window is primarily located on
Per-Monitor V2	Windows 10 Creators Update (1703)	Application uses DPI of the current display. Change DPI on the fly by sending WM_DPICHANGED .



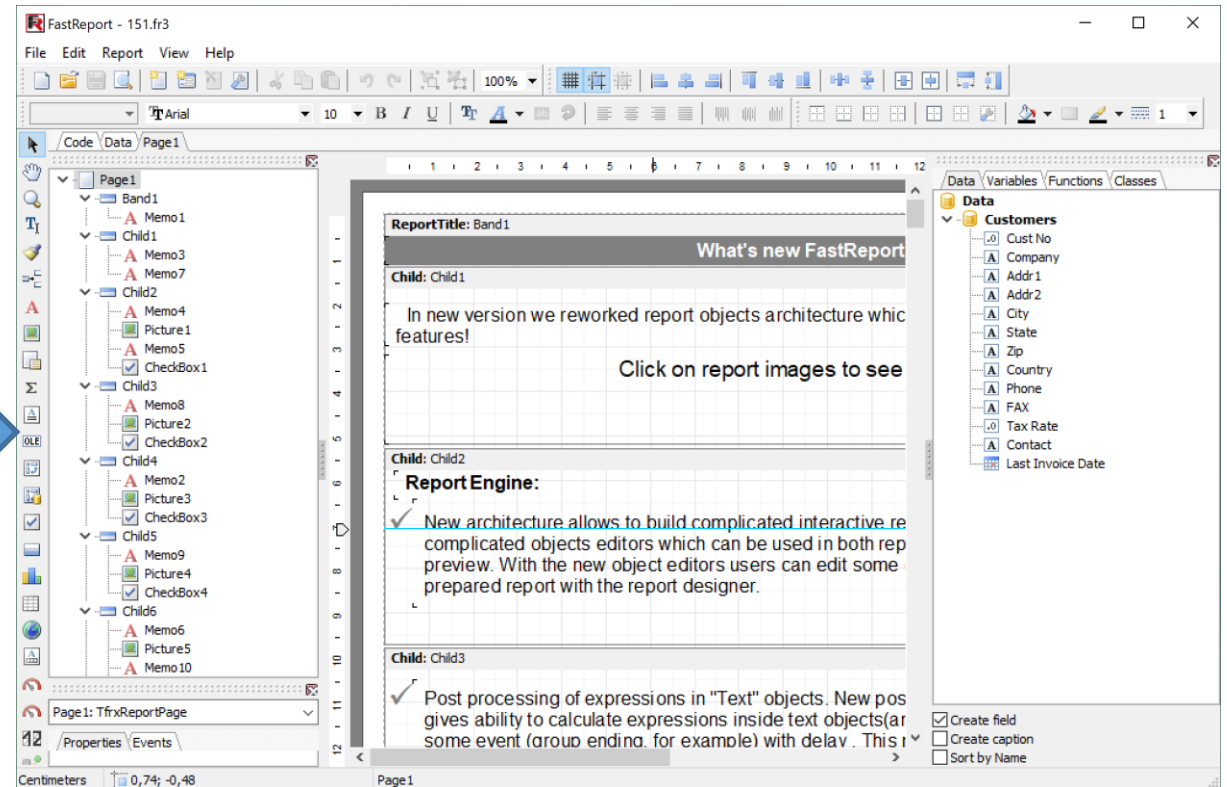
Windows 10

Unaware mode

Draws on memory surface



Stretch



Unaware mode – is it safe ?

Unaware

Virtualization

GetSystemMetrics
SystemParametersInfo
GetDpiForMonitor

Unaware mode – is it safe ?

Unaware

Virtualization

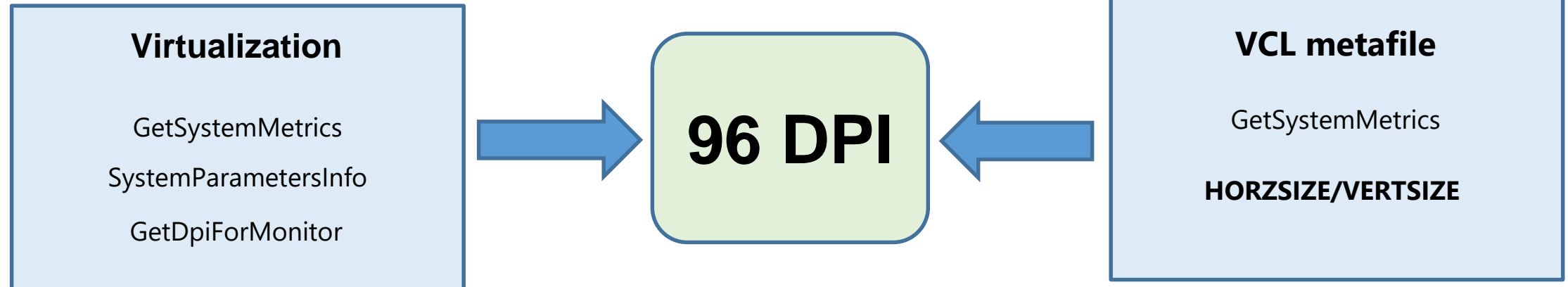
GetSystemMetrics
SystemParametersInfo
GetDpiForMonitor



96 DPI

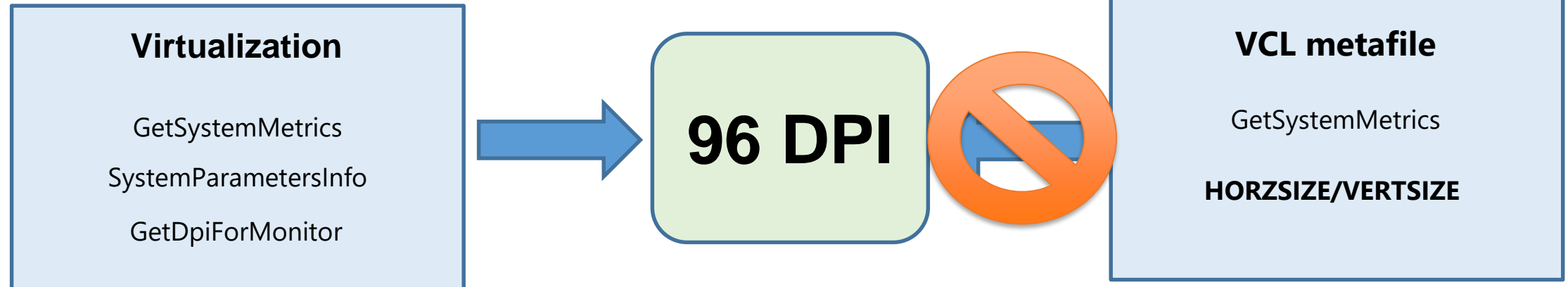
Unaware mode – is it safe ?

Unaware



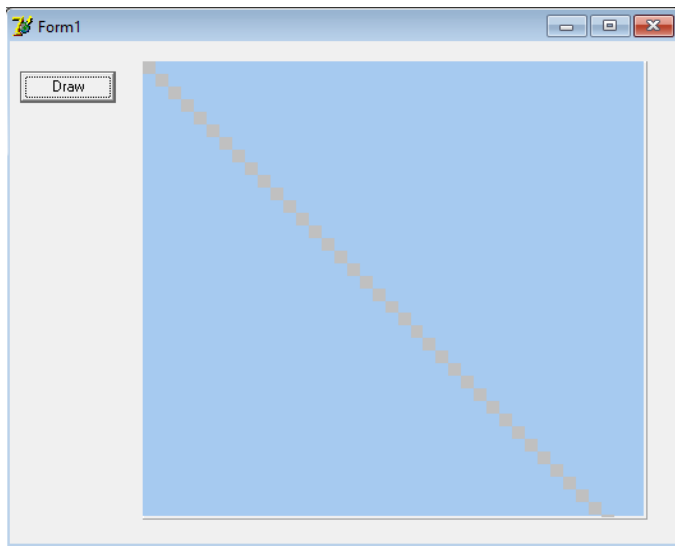
Unaware mode – is it safe ?

Unaware

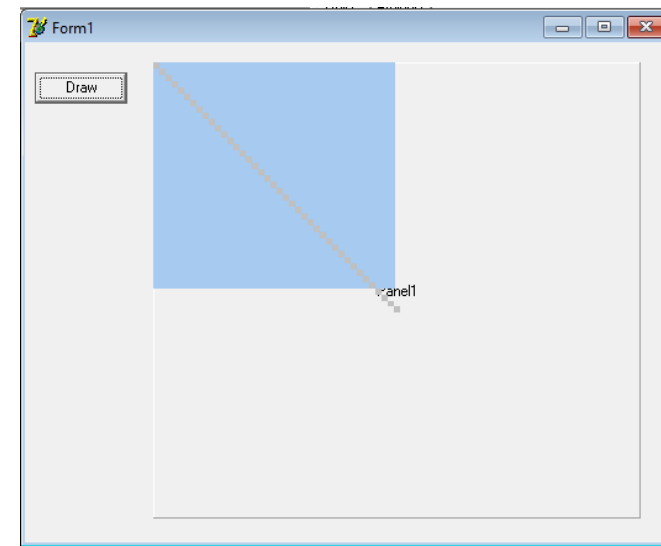


Unaware mode – is it safe ?

Normal



Stretched



Unaware mode – VCL metafile

```

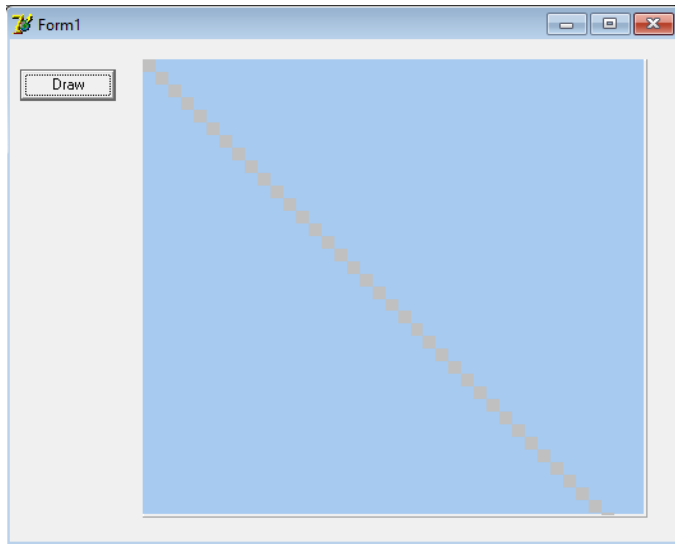
]procedure GetDisplayScale(var aScaleX, aScaleY: Extended);
var
    DevMode: TDevMode;
begin
    aScaleX := 1;
    aScaleY := 1;
    // scale factor for non DPI aware applications
    // msdn.microsoft.com/en-us/library/windows/desktop/dn469266(v=vs.85).aspx
    ZeroMemory(@DevMode, sizeof(DevMode));
    if EnumDisplaySettings(nil, Cardinal(-1){ENUM_CURRENT_SETTINGS MSDN FLAG}), DevMode) then
    begin
        aScaleX := 1 / (DevMode.dmPelsWidth / GetSystemMetrics(SM_CXSCREEN));
        aScaleY := 1 / (DevMode.dmPelsHeight / GetSystemMetrics(SM_CYSCREEN));
    end;
end;

function CreateMetafile(aWidth, aHeight: Integer): TMetafile;
var
    aScaleX, aScaleY: Extended;
begin
    GetDisplayScale(aScaleX, aScaleY);
    Result := TMetafile.Create;
    Result.Width := Round(aWidth * aScaleX);
    Result.Height := Round(aHeight * aScaleY);
end;

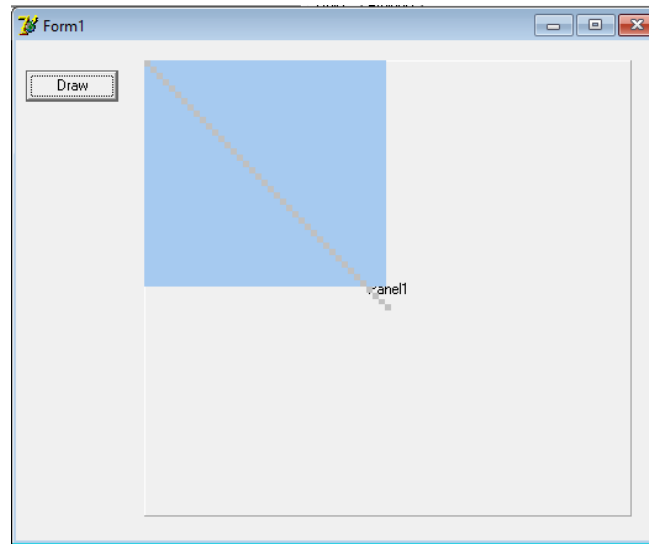
```

Unaware mode – VCL metafile

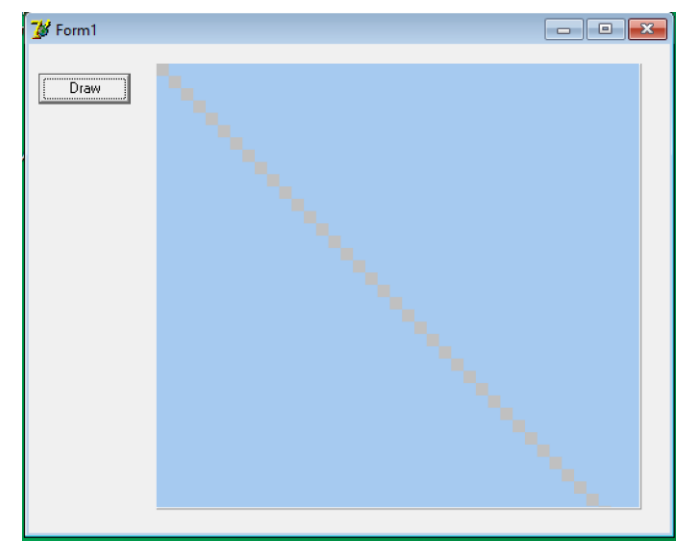
Normal



Stretched



Stretched(scale back)



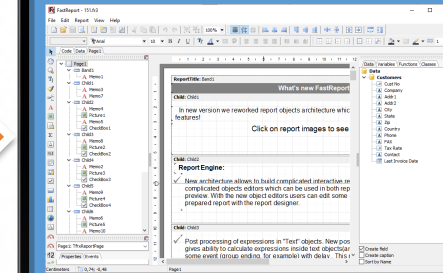
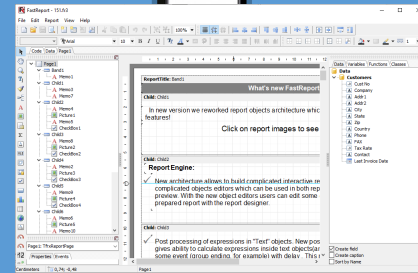
Per-Monitor V2 mode

WM_DPICHANGED

8K ULTRA HD

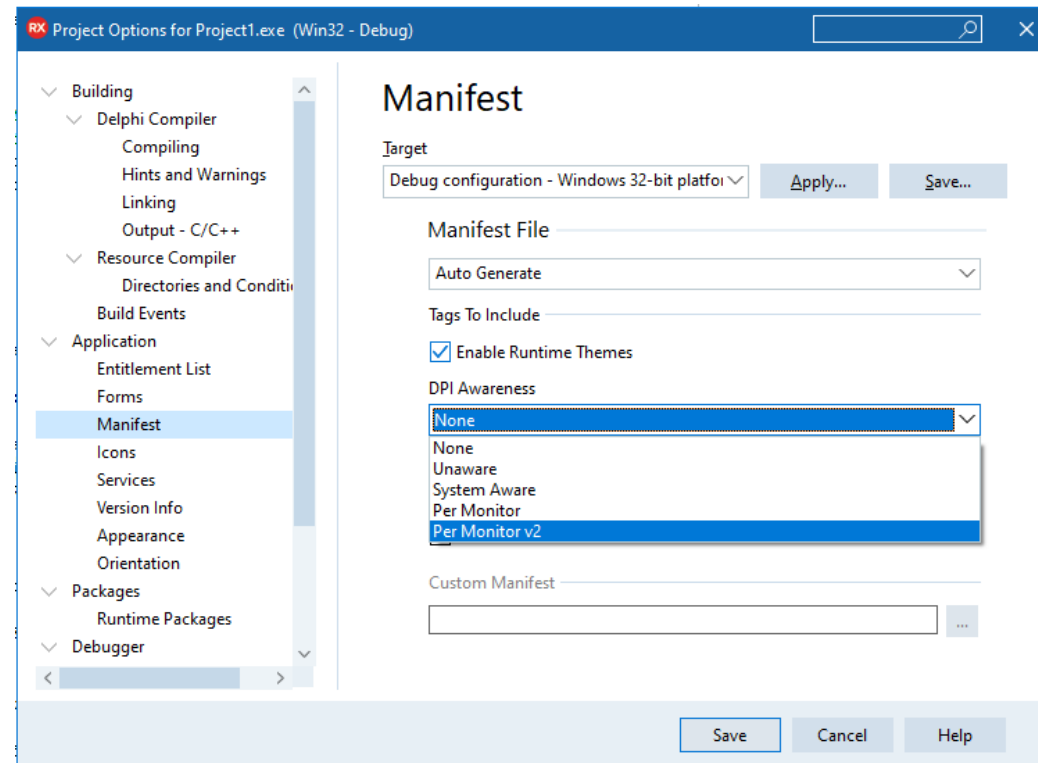
4K ULTRA HD

Full HD



Delphi HiDPI support

Project options



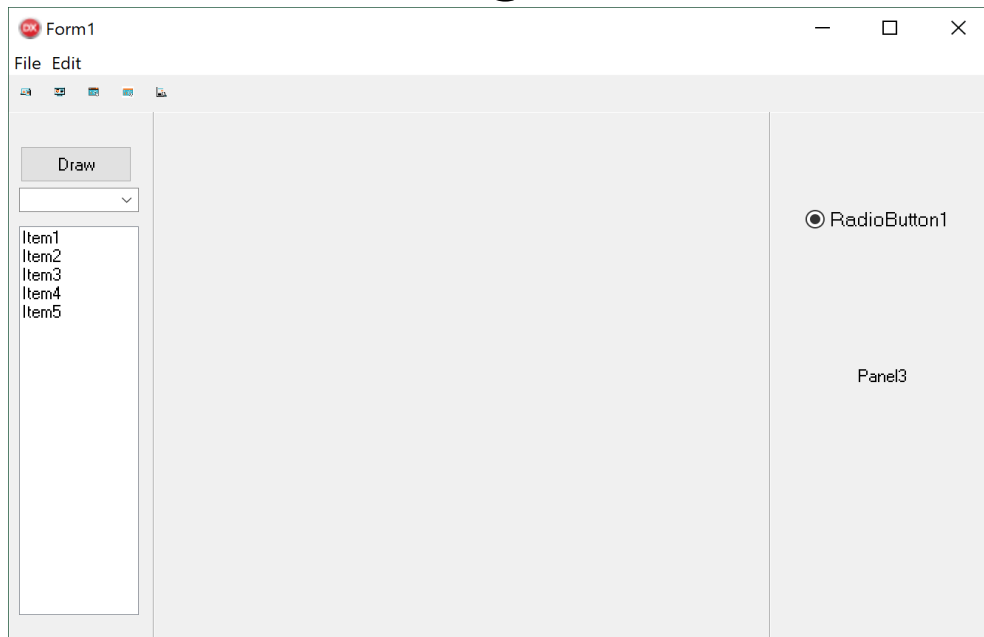
Delphi HiDPI support – Simple application

Steps to move simple application for HiDPI

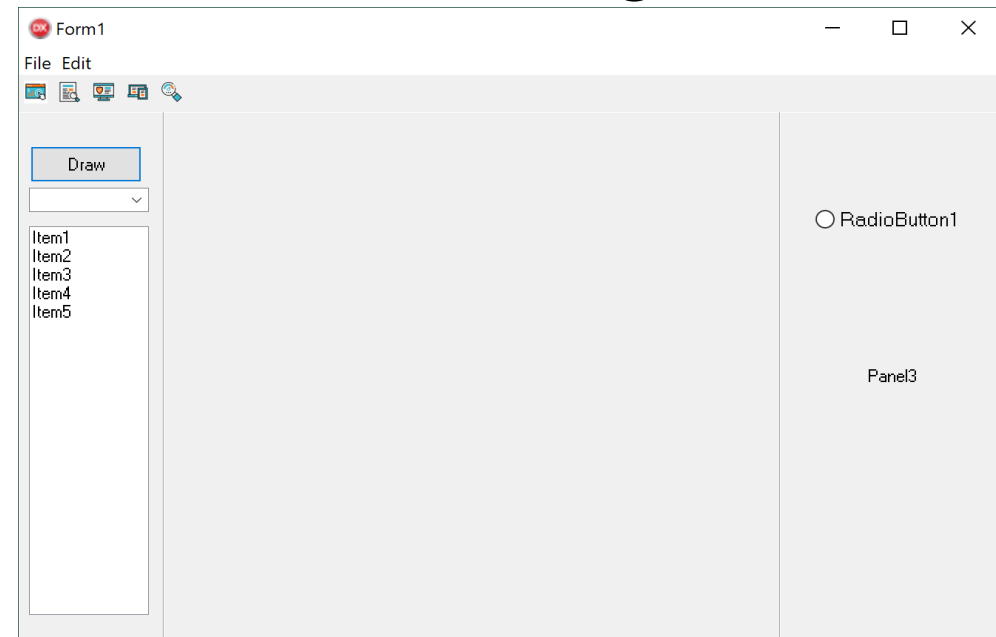
- Turn on HiDPI manifest in project settings;
- Use **Screen.PixelsPerInch** – primary display DPI;
- Check all custom draw for absolute positions;
- Use **Control.CurrentPPI** to get current PPI of control;
- Use **TVirtualImageList** instead of **TImageList**;
- Mixed mode for Dialogs (**SetThreadDpiAwarenessContext**);
- Form events **OnBeforeMonitorDpiChanged/OnAfterMonitorDpiChanged**;

Delphi HiDPI support – Simple application

TImageList



TVirtualImageList



More about TVirtualImageList:

http://docwiki.embarcadero.com/RADStudio/en/Supporting_high-DPI_images_with_the_Image_Collection_and_Virtual_ImageList_components

Delphi HiDPI support – Components

Delphi's control

TControl (10.2)

property CurrentPPI
procedure ScaleForPPI
procedure ChangeScale
procedure ScaleControlsForDpi

FastReport VCL Delphi independent controls

TfrxBaseForm

property CurrentFormPPI
procedure UpdateResouces
procedure UpdateFormPPI
procedure ProcessPreferences
message WM_DPICHANGED

TfrxDPIAwareCustomControl

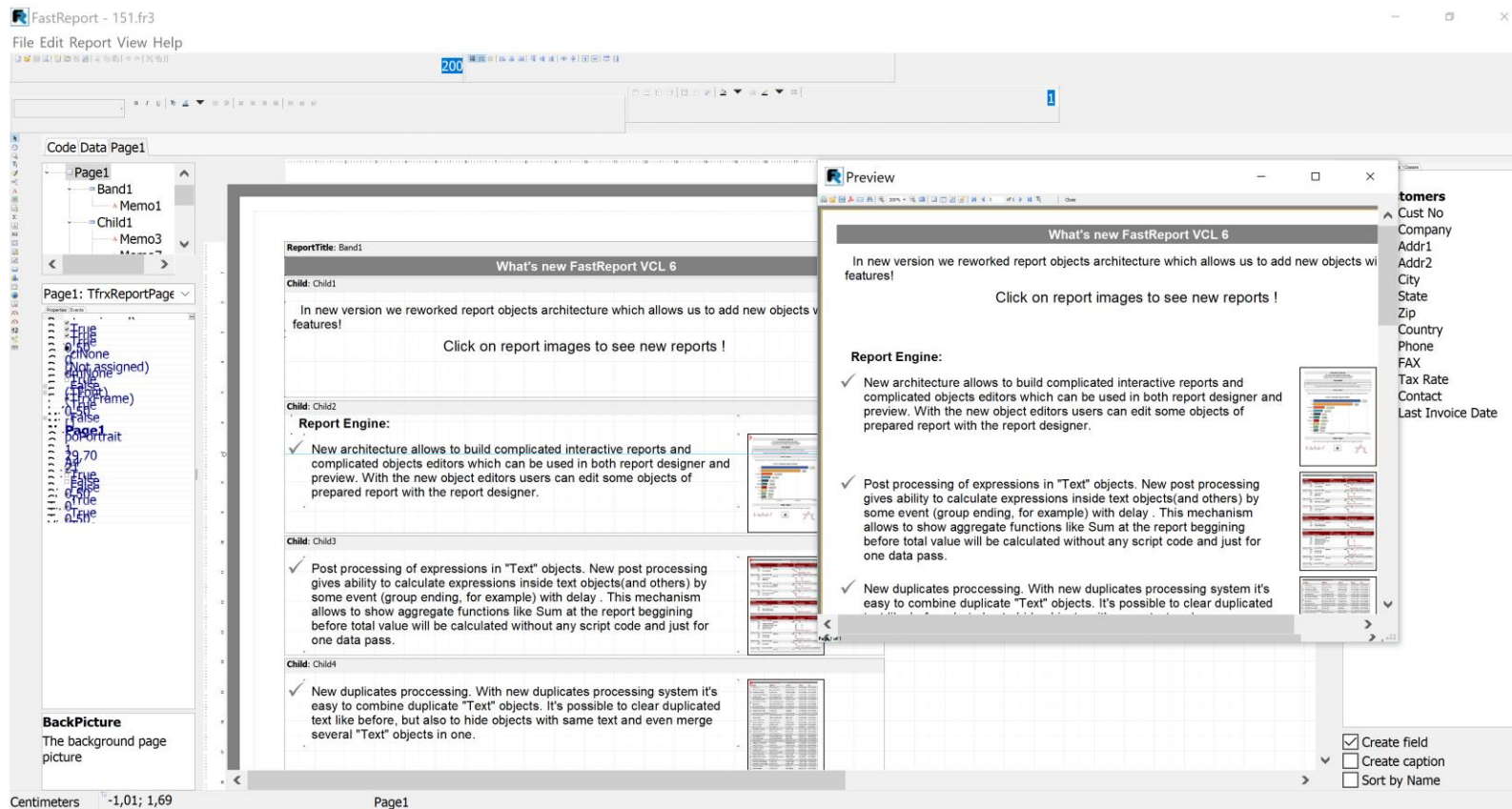
property CurrentPPI
procedure DoPPIChanged
procedure GetScale
message WM_DPICHANGED_AFTERPARENT

Delphi HiDPI support – create version independent Components

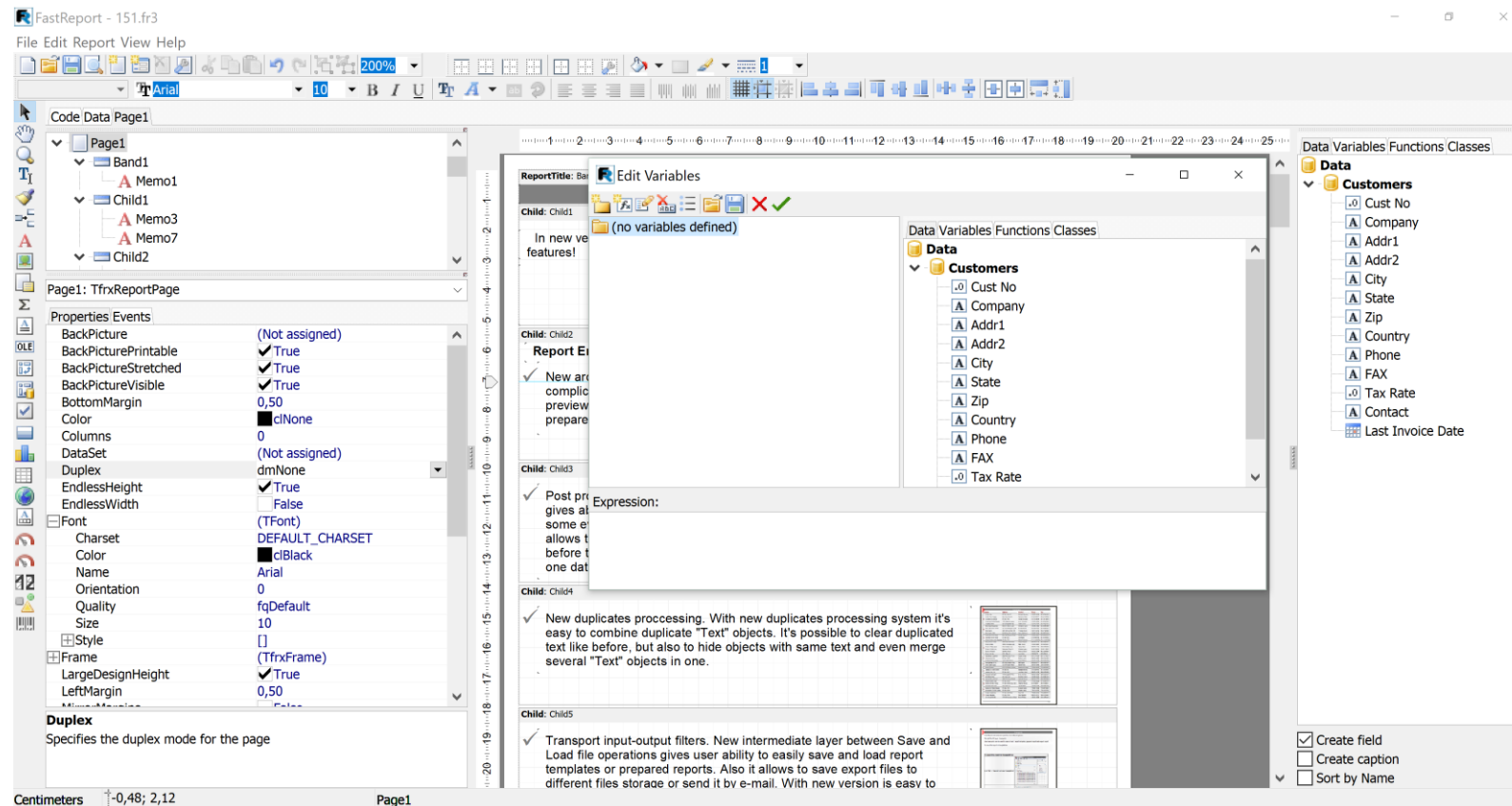
- Use **Screen.PixelsPerInch** – in constructor to get primary display DPI;
- Handle **WM_DPICHANGED** for custom form;
- Handle **WM_DPICHANGED_AFTERPARENT** for custom control;
- Create independent resource module and handle TImageList;
- Do not use absolute values for custom draw;
- Use dynamic links to HiDPI WinAPI (GetDpiForWindow, SetProcessDpiAwarenessContext)



HiDPI in FastReport VCL(Scale 300% no HiDPI)



HiDPI in FastReport VCL(Scale 300% HiDPI)



HiDPI in FastReport VCL

Surround support



HiDPI in FastReport VCL

Surround support



HiDPI in FastReport VCL

Surround support – restore window on active display



thank you
kyōū



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