Everything Microsoft Windows

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What we'll cover

- Technologies
  - OS features, HiDPI, ActiveX/COM, DWM, XAML islands, UWP, Desktop App Converter
- Frameworks
  - Win32, .NET, WPF, WinForms, COM components, WinRT, Direct2D, GDI/GDI+

Windows XP (2001-2014)

- Visual styles & themes
  - Classic vs. Themed
- GDI+
  - Alpha-channel support
  - Anti-aliasing support
 - New text rendering engine

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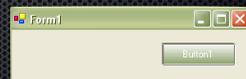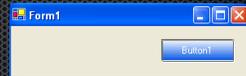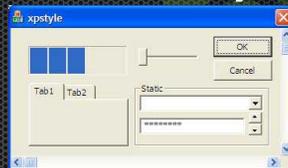
Windows XP & Xojo

- Xojo dropped support for XP in 2015r3
- GDI+ support dropped in 2016r4

# Windows Vista/7

- DWM and Aero
- Direct2D
- HiDPI
- WPF
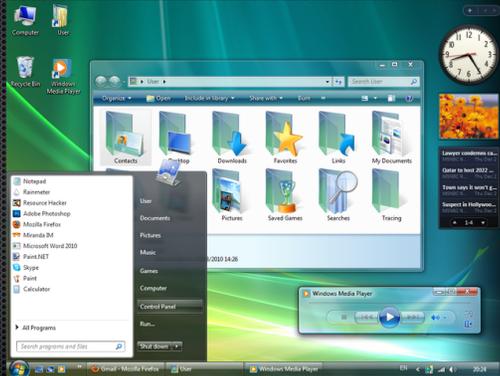
Windows Vista/7 & Xojo

- Xojo dropped support for Vista in 2016r1
- HiDPI & Direct2D/DirectWrite support in 2016r4
- Windows 7 End of support Jan 2020

Windows 8

- Metro UI (UWP)
- Classic & Aero theme dropped
- DWM permanent
- Per-monitor HiDPI
- Windows Store
- WinRT
- Universal C Runtime
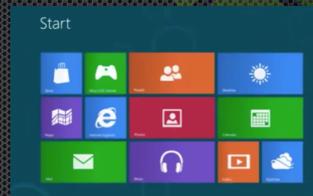
Windows 8 & Xojo

- Switched to Universal C Runtime in 2016r1
- Support for Per-monitor HiDPI
- Access to WinRT through COM

Windows 10

- Free upgrade
- UWP
  - Desktop, Mobile, Xbox, HoloLens
- Project centennial
  - Introduced Desktop App Converter
- XAML islands
  - Access UWP controls in Win32 apps

Windows Desktop Apps

- UWP
  - Windows 10
  - UI - XAML
- WPF
  - Composited
- WinForms
  - Pseudo-Transparency, closest to Win32

Windows Desktop Apps

- Win32
  - Not dependent on managed runtime
  - Highest level of performance
  - Direct access to hardware
  - Can access WPF, WinRT and now UWP UI

Xojo on Windows

- Native Win32 controls
  - Composited via pseudo-transparency
- Supports visual styles & classic theme
- Direct2D & DirectWrite
- Per-monitor HiDPI support
- Universal C Runtime
- ActiveX/COM

Transparency

- 2018r1 introduced pseudo-transparency
  - We handle compositing
  - Loss of true Transparency
    - Avoid partial overlapped controls
    - Avoid transparency on animated controls
  - WinForms .NET uses same model

Pseudo-Transparency Demos

Best Practices

- Limit Transparency
- Do not partially overlap controls
- Enable ContainerControl.DoubleBuffer
  - Turns on Win32 compositing
  - For smoother scrolling
    - Or trigger Refresh after moving many controls
    - Or delay refreshes with WM_SETREDRAW

Direct2D

- Replaces GDI+
- HiDPI ready
- Drawing is queued
  - Flushed when Graphics released
  - Or when Paint event completes
  - Flushed for Pictures when it is drawn/used
- Interop'ing with GDI/HDC is expensive

DirectWrite

- Replaces GDI text rendering
- HiDPI ready
- Two rendering modes
  - GDI Compatible
 - DirectWrite default
    - Pictures with alpha channel

HiDPI

- Manifest update for 32-bit in 2019r1
- Fractional scale
  - Anti-alias effect
- Picture Horizontal/Vertical resolution
  - 96 DPI

Universal C Runtime

- Available in Windows 8.1 & 10
- Create installer
  - Redists in Extras/Windows Runtime
- Build option to Include Runtime DLLs

ActiveX/COM features

- HTMLViewer, MoviePlayer, Direct2D, Drap & Drop
- Windows IDE menu: Insert->ActiveX Component
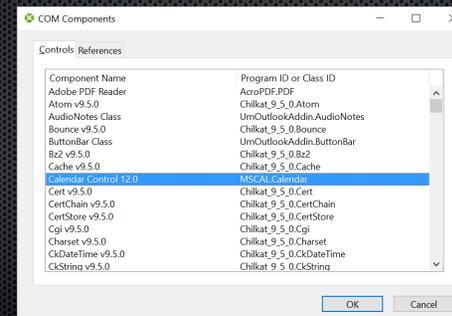
ActiveX control added
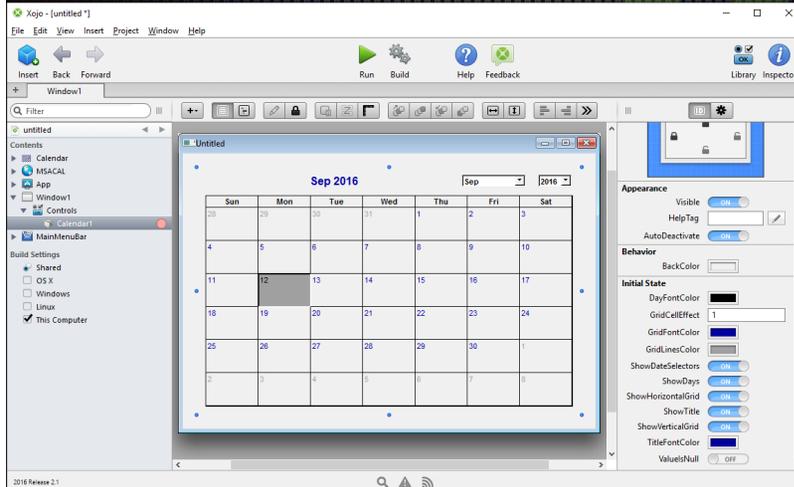
COM features

- Task bar progress uses COM
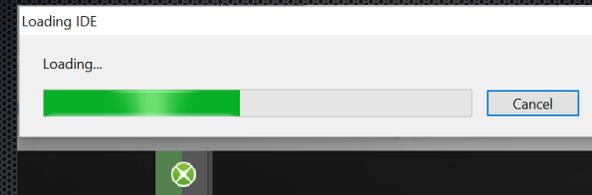
- Extending features
  - Deleting folder recursively

WinRT

- A framework like Win32
- Unmanaged native API
- Based on COM, with extended features
  - IInspectable base interface
  - Provides list of supported interfaces
- Access to many features including toast notification

ActiveX/COM Demos

Best Practices

- Installers for ActiveX controls
- OLEObject communicates via IDispatch
- OLEParameter
  - Pass by name/position

Extending features

- Declares
  - Adding other Win32 controls
  - WM_SETREDRAW
- COM
  - ActiveX controls
  - Accessing WinRT
- .NET controls via Plugins SDK

Extending Features Demos

Windows tips

- Preferences
  - HKEY_LOCAL_MACHINE\SOFTWARE
  - HKEY_CURRENT_USER\Software
- Debugging
  - DebugView
  - Windows Error Reporting
  - Send us crash dump files

Windows tips

- Single vs. Multi-instance
  - Use Mutex
- Declares
  - Libs folder, current directory, system directory

Q & A

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