

Evaluation Topics

- Chromium based Edge usage in WPF



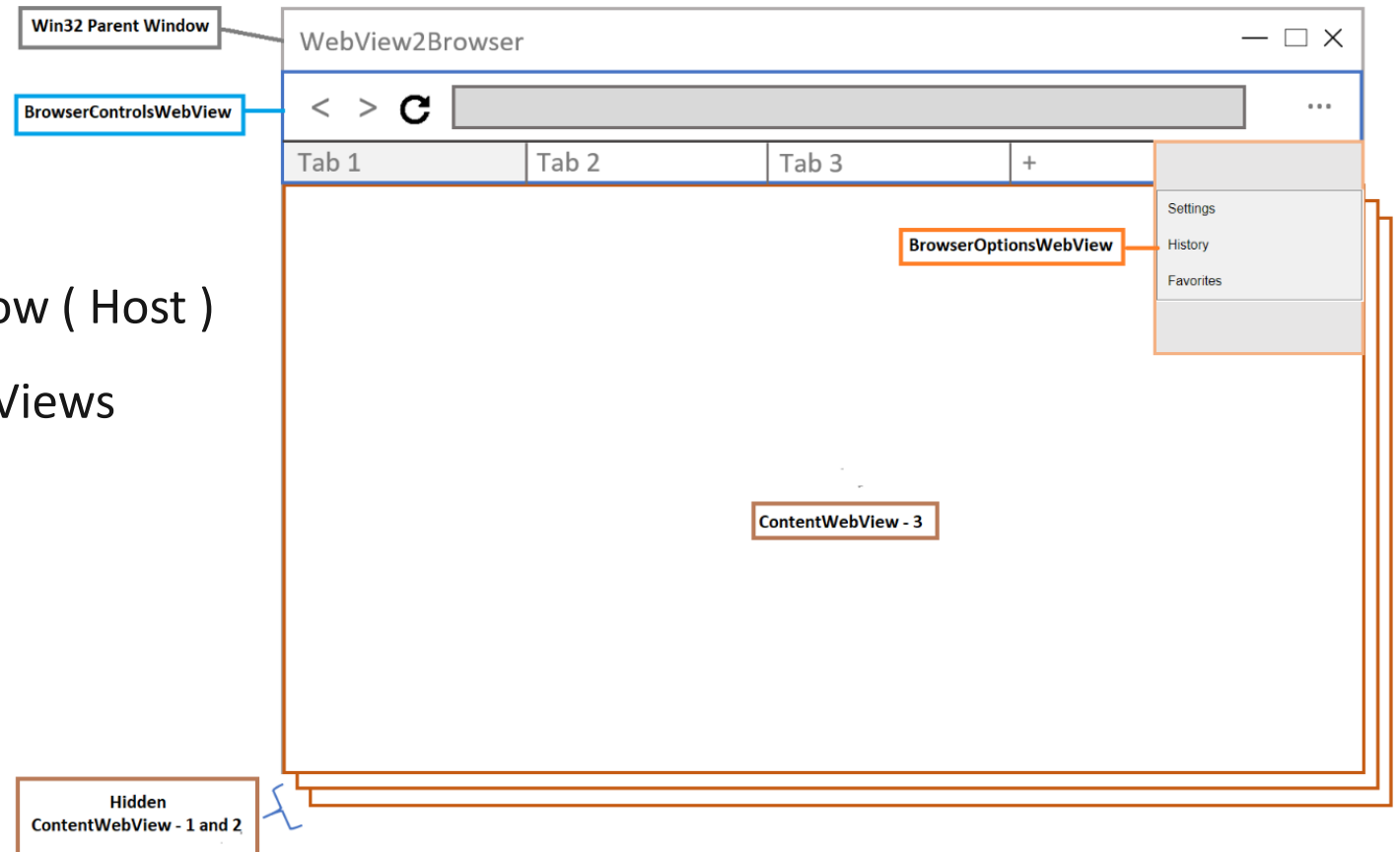
Chromium based Edge Control - Webview2

Current state from Microsoft

Developer preview is first available for Win32 C++ on Windows 10.

WebView2 Developer preview:

- A single window win32 app
- Multiple WebViews within Parent Window (Host)
- Communication between host and WebViews
- Navigate API in WebView2 to Load Page
(IWebView2WebView::Navigate)



Link:

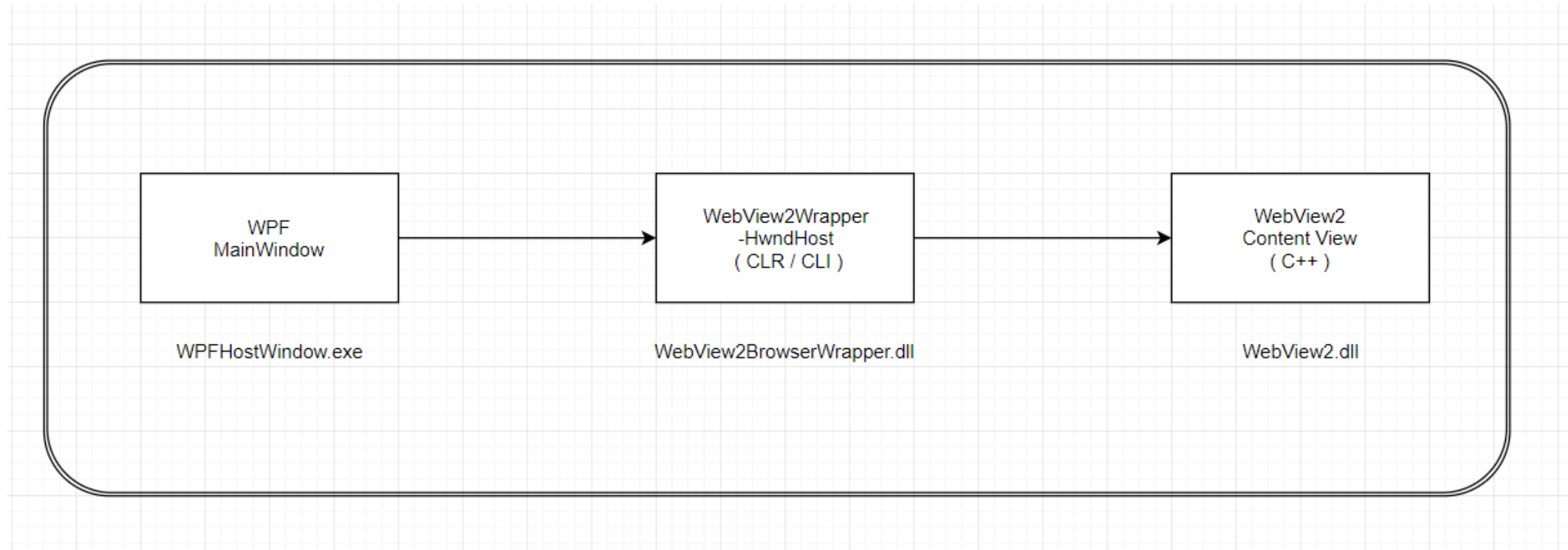
<https://blogs.windows.com/msedgedev/2019/08/15/webview2browse-sample-for-webview2/#PYmmq2UhbdOyjRPV.97>

Planned Activities

- Hosting Of WebView2 in WPF Window
- Evaluate Performance
- PDF Content Loading
- Input handling (Ex: Keyboard, Mouse etc..)
- Parent and Child window interactions (Ex: Resize etc..)
- Update from Microsoft (Verifying latest Webview2 and Edge version)
- Kiosk Mode

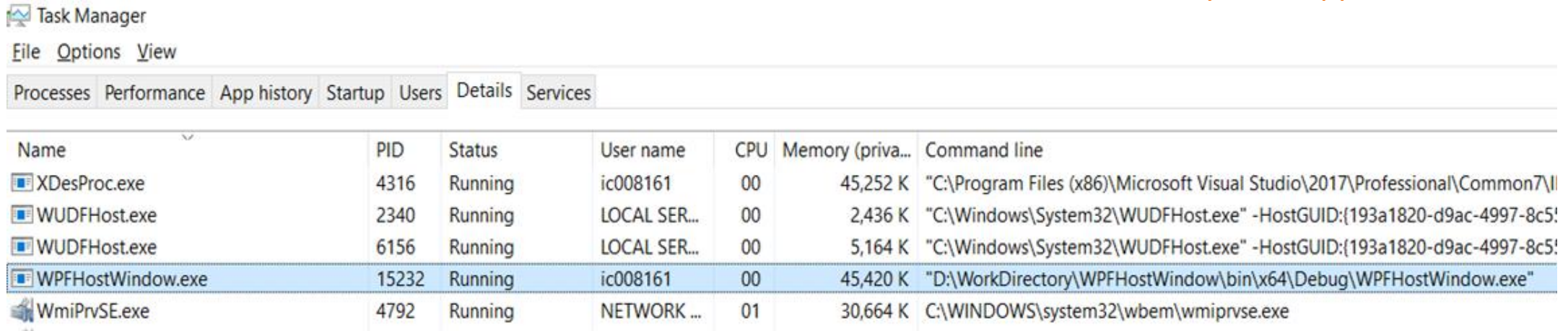
Hosting Of Webview2 in WPF Window

Current Status



Process View – Before & After WebView2 Hosting in WPF

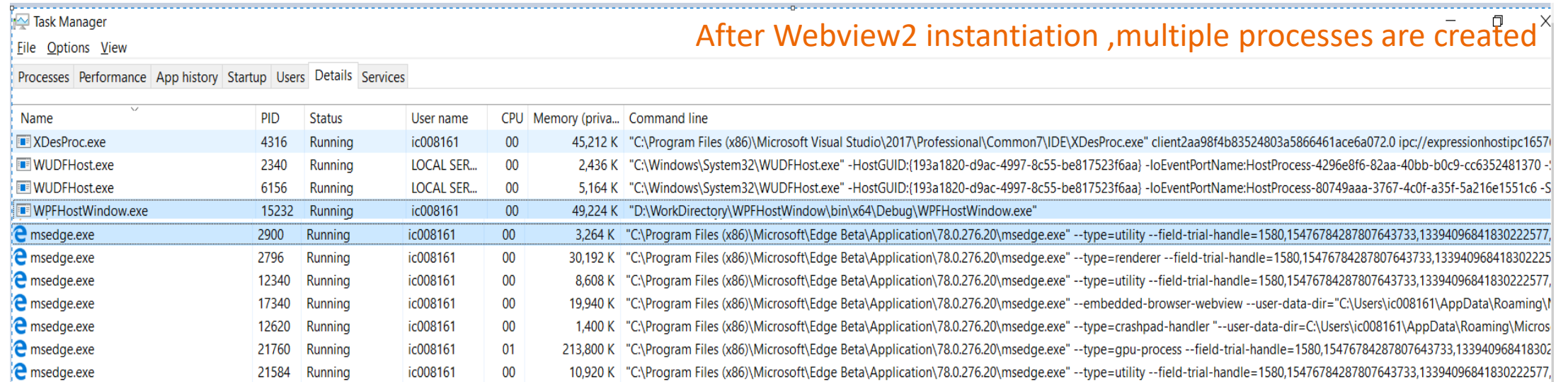
Before Webview2 instantiation, only WPF Application exists



A screenshot of the Windows Task Manager 'Processes' tab. The window title is 'Task Manager' with menu items 'File', 'Options', and 'View'. The 'Processes' tab is selected, showing a list of running processes. The processes listed are XDesProc.exe, WUDFHost.exe (two instances), WPFHostWindow.exe, and WmiPrvSE.exe. WPFHostWindow.exe is highlighted in blue.

Name	PID	Status	User name	CPU	Memory (private)	Command line
XDesProc.exe	4316	Running	ic008161	00	45,252 K	"C:\Program Files (x86)\Microsoft Visual Studio\2017\Professional\Common7\IDE\XDesProc.exe" client2aa98f4b83524803a5866461ace6a072.0 ipc://expressionhostipc1657...
WUDFHost.exe	2340	Running	LOCAL SER...	00	2,436 K	"C:\Windows\System32\WUDFHost.exe" -HostGUID:{193a1820-d9ac-4997-8c55-be817523f6aa} -IoEventPortName:HostProcess-4296e8f6-82aa-40bb-b0c9-cc6352481370 -S...
WUDFHost.exe	6156	Running	LOCAL SER...	00	5,164 K	"C:\Windows\System32\WUDFHost.exe" -HostGUID:{193a1820-d9ac-4997-8c55-be817523f6aa} -IoEventPortName:HostProcess-80749aaa-3767-4c0f-a35f-5a216e1551c6 -S...
WPFHostWindow.exe	15232	Running	ic008161	00	45,420 K	"D:\WorkDirectory\WPFHostWindow\bin\x64\Debug\WPFHostWindow.exe"
WmiPrvSE.exe	4792	Running	NETWORK ...	01	30,664 K	C:\WINDOWS\system32\wbem\wmiprvse.exe

After Webview2 instantiation, multiple processes are created



A screenshot of the Windows Task Manager 'Processes' tab, showing the state after WebView2 instantiation. The window title is 'Task Manager' with menu items 'File', 'Options', and 'View'. The 'Processes' tab is selected. In addition to the processes from the previous screenshot, several msedge.exe processes are now running, representing the WebView2 hosting environment. WPFHostWindow.exe remains highlighted in blue.

Name	PID	Status	User name	CPU	Memory (private)	Command line
XDesProc.exe	4316	Running	ic008161	00	45,212 K	"C:\Program Files (x86)\Microsoft Visual Studio\2017\Professional\Common7\IDE\XDesProc.exe" client2aa98f4b83524803a5866461ace6a072.0 ipc://expressionhostipc1657...
WUDFHost.exe	2340	Running	LOCAL SER...	00	2,436 K	"C:\Windows\System32\WUDFHost.exe" -HostGUID:{193a1820-d9ac-4997-8c55-be817523f6aa} -IoEventPortName:HostProcess-4296e8f6-82aa-40bb-b0c9-cc6352481370 -S...
WUDFHost.exe	6156	Running	LOCAL SER...	00	5,164 K	"C:\Windows\System32\WUDFHost.exe" -HostGUID:{193a1820-d9ac-4997-8c55-be817523f6aa} -IoEventPortName:HostProcess-80749aaa-3767-4c0f-a35f-5a216e1551c6 -S...
WPFHostWindow.exe	15232	Running	ic008161	00	49,224 K	"D:\WorkDirectory\WPFHostWindow\bin\x64\Debug\WPFHostWindow.exe"
msedge.exe	2900	Running	ic008161	00	3,264 K	"C:\Program Files (x86)\Microsoft\Edge Beta\Application\78.0.276.20\msedge.exe" --type=utility --field-trial-handle=1580,15476784287807643733,1339409684183022577,...
msedge.exe	2796	Running	ic008161	00	30,192 K	"C:\Program Files (x86)\Microsoft\Edge Beta\Application\78.0.276.20\msedge.exe" --type=renderer --field-trial-handle=1580,15476784287807643733,1339409684183022577,...
msedge.exe	12340	Running	ic008161	00	8,608 K	"C:\Program Files (x86)\Microsoft\Edge Beta\Application\78.0.276.20\msedge.exe" --type=utility --field-trial-handle=1580,15476784287807643733,1339409684183022577,...
msedge.exe	17340	Running	ic008161	00	19,940 K	"C:\Program Files (x86)\Microsoft\Edge Beta\Application\78.0.276.20\msedge.exe" --embedded-browser-webview --user-data-dir="C:\Users\ic008161\AppData\Roaming\I...
msedge.exe	12620	Running	ic008161	00	1,400 K	"C:\Program Files (x86)\Microsoft\Edge Beta\Application\78.0.276.20\msedge.exe" --type=crashpad-handler --user-data-dir=C:\Users\ic008161\AppData\Roaming\Micros...
msedge.exe	21760	Running	ic008161	01	213,800 K	"C:\Program Files (x86)\Microsoft\Edge Beta\Application\78.0.276.20\msedge.exe" --type=gpu-process --field-trial-handle=1580,15476784287807643733,1339409684183022577,...
msedge.exe	21584	Running	ic008161	00	10,920 K	"C:\Program Files (x86)\Microsoft\Edge Beta\Application\78.0.276.20\msedge.exe" --type=utility --field-trial-handle=1580,15476784287807643733,1339409684183022577,...

Performance Evaluation Scenario

- WPF application with data grid control (100 rows)
- WPF application with Angular 9 Page of Material Table rendered using WebView2 (100 Rows)

Scenario 1 – First Time Startup

WPF DataGrid - OnMainWindowLoaded;

Duration – **203** MilliSeconds

HTML - Table - Angular9 – OnTabNavigationCompleted;

Duration – **2168** MilliSeconds

Performance Evaluation Scenario

Scenario – 2 – Second Time Startup (Caching)

WPF DataGrid - OnMainWindowLoaded;

Duration – **203** MilliSeconds

HTML - Table - Angular9 – OnTabNavigationCompleted;

Duration – **600** MilliSeconds

PS:

1. C++ DLL, C# Wrapper, WPF Application - builded in Debug, X64
2. WPF DataGrid Application - builded in Debug, X64

Interactions analysis

Handling Resize Scenarios of Parent WPF Window In C# Wrapper

```
System::IntPtr WndProc(System::IntPtr hwnd, int msg, System::IntPtr wParam, System::IntPtr lParam, bool% handled) override
{
    handled = false;
    switch (msg)
    {
        case WM_SIZE:
        {
            if (myBrowserWindow != nullptr)
            {
                RECT bounds;
                GetClientRect((HWND)hwnd.ToPointer(), &bounds);
                int newWidth = LOWORD((DWORD)lParam.ToPointer());
                int newHeight = HIWORD((DWORD)lParam.ToPointer());
                MoveWindow((HWND)myWin32Window.ToPointer(), bounds.left + 5, bounds.top + 5, newWidth, newHeight, TRUE);
                myBrowserWindow->ResizeTabWebViews();
            }
        }
        break;
    }
    return System::IntPtr::Zero;
}
```


Input Handling

TAB Input Handling from WPF Control to Web Controls in C# Wrapper

```
virtual bool TabInto(TraversalRequest^ request) override
{
    if (request->FocusNavigationDirection == FocusNavigationDirection::First)
    {
        myBrowserWindow->SetFocus();
    }

    return true;
}
```