Integrating HTMLRenderer in Win32 UI

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Done!

```
'h'□wc'HTMLRenderer' ('URL' 'c:\myapp\index.html')
```

Just kidding! You just discovered the second half of your career.

Disclaimer!

(Verbal)

Why HTMLRenderer?

really too many reasons to list...

CefSharp did not work :D

CEF - Chromium Embedded Framework

- **WC integration with existing Win32 controls**
- JSON provides for easy I/O

HTML5 - CSS3 - JS (the triad)

Modern UI/UX features scaling, responsiveness and touch.

Why HTMLRenderer?

really too many reasons to list...

Countless libraries, development tools and most important, developers

UI is very error tolerant

PDF Document Generation from single well structured HTML source

Web Components

```
<norbert-is-a-genius>
    <img src=”norbert.com/myface.img”/>
</norbert-is-a-genius>
```

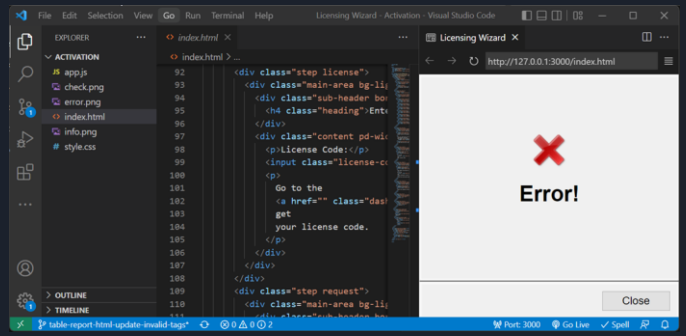
Futureproof - Write your desktop GUI as if it is running on a web server!

What took so long?

Stability	- Interpreter crashes were common in testing
Missing features DoPopup	- No request method: GET, PUT, PATCH, ExecuteJavaScript,
Acceptance	- It's hard to give up control
Apprehension	- Old dogs can learn new tricks. I mentioned the *triad* (H5/CSS3/JS)
APL Framework management	- Develop form handling, internal serialization and I/O
Data Structures files!	- Move from binary storage to JSON - We were unable to save
HTML5 -JS - CSS interactions.	- Rich interactive applications require a new set of skills. Learn to think asynchronously in your UI

Tooling

- VS Code
  - Supported by Windows, Unix and Mac
  - Online version
  - Plugins!
    - Live Server
    - Code Autocomplete
    - Chrome/Edge Dev tools
    - Linters
    - Spell Checkers
    - Git
    - Docker
    - Etc… Etc… Etc…
- External Resources
  - Developers



PDF and Document Generation

Single Source Printing

HTML for on screen display

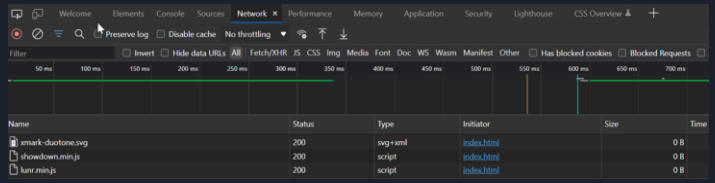
- Responsive (adjusts to your device)
- Portable

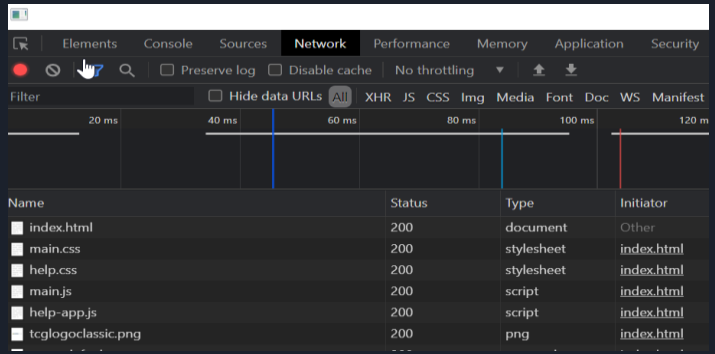
PDF is for documents

- Generate PDFs from well structured HTML source with print specific CSS
- Browser native printing lacks full support of CSS print specifications
- Third-part library (commercial) - full print media CSS support including headers, footers and page numbers.

Debug Tools

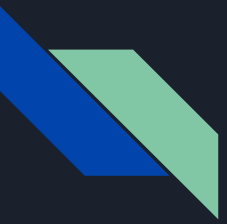
Common UI for Chrome, Edge and HTMLRenderer Developer Tools





Integration Considerations

- No developer upgradeability
- Large distribution package - ~150MB added
- Clipboard integration - document.execCommand
- HTMLRenderer crashes tend to crash the interpreter
- Can’t mix protocols file:// | http(s)://
- UI threading
  - Don’t run UI in the main thread
- DOM SIze
  - Data Tables use virtual scrolling
- Web Sockets - Roll your own protocol
- Images
  - Move to SVG



Use Cases

PDF Viewer Considerations

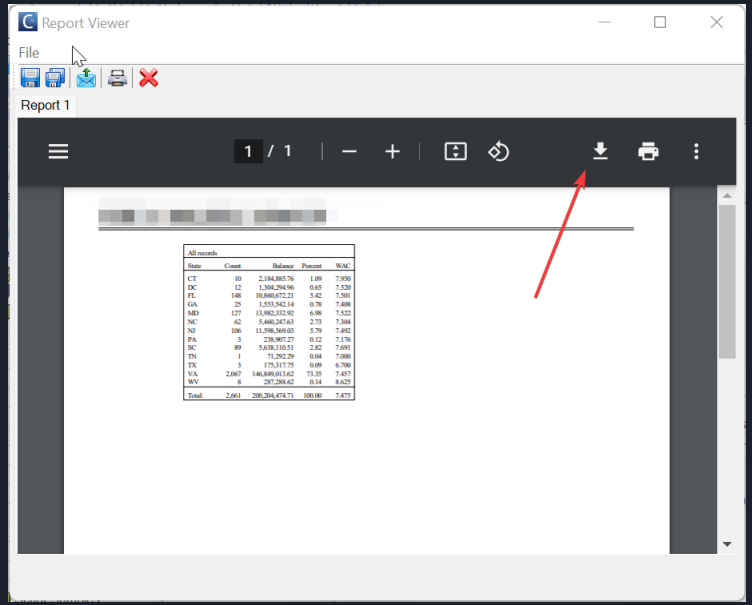
Download button

- Does not work if content loaded with file:// scheme
- Fires HTTPRequest event without context.

  GET: http://dyalog_root/

Title

- Filename from file://
  - Looks bad for with funky temp names.



User Case - Splashscreen

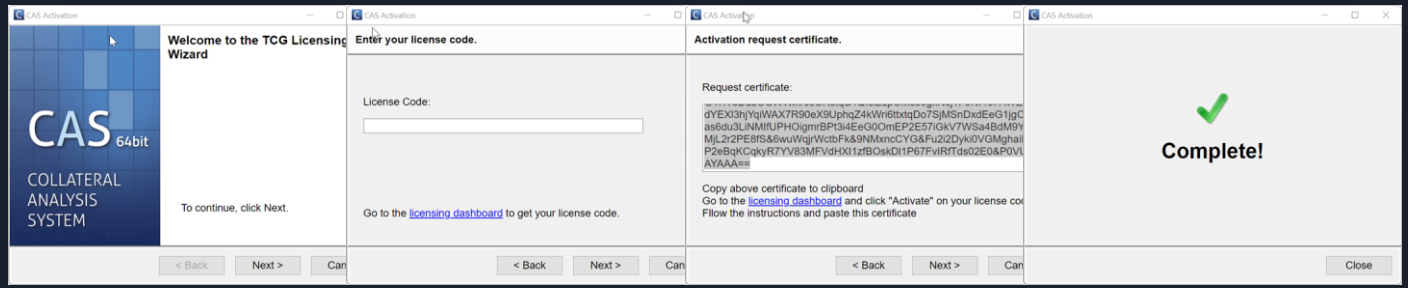
SVG

Scaling

CEF Startup

Use Case - Activation Wizard

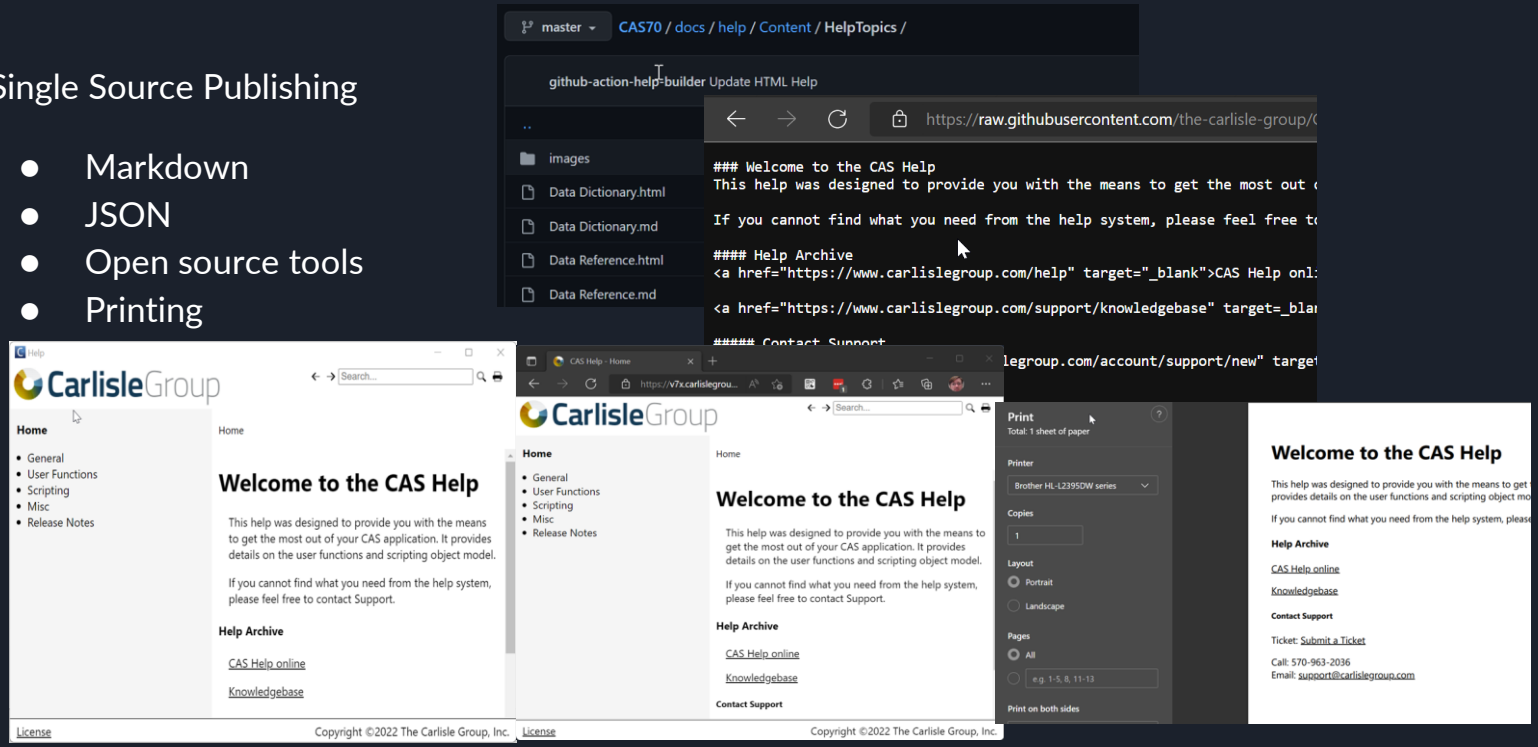
- Solved DPI scaling issues of previous .NET 2 Wizard Control
- Forced to learn how to document an API
- Generate test data structures
- Application provides REST API
  - Outsourced developer
  - Self Contained



Use Case - Application Help

Single Source Publishing

- Markdown
- JSON
- Open source tools
- Printing



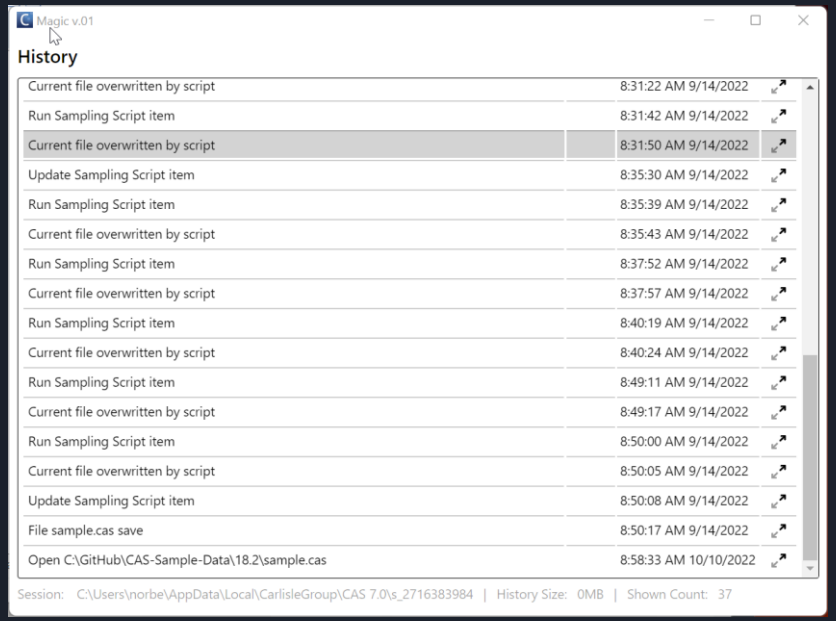
Use Case - Audit Log

Single Source

- Desktop
  - HTMLRenderer
- Windows Service
  - Browser Request

Simplicity

- HTML UI timer polls main application for changes
- Single UI displays event details and historical reports.



Use Case - Data View

Threading Gotcha!

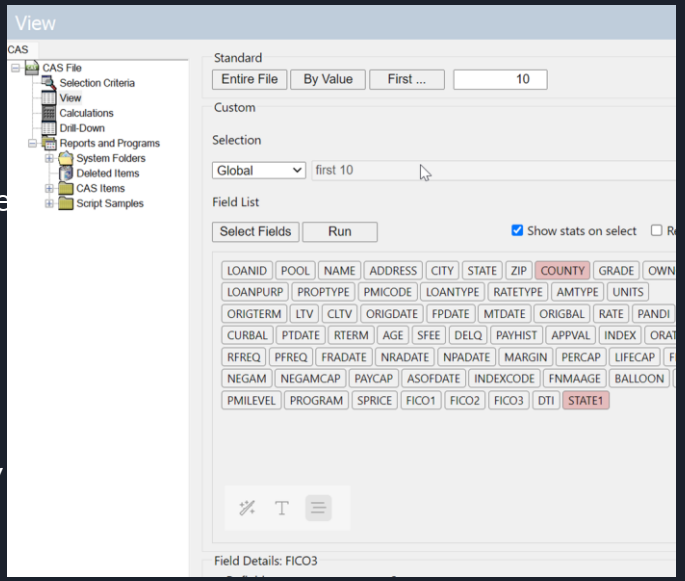
Form hosts HTMLRenderer

Not easy to get content of HTMLRendere

when switching windows

HTTPRequest and WebSocketReceive blocked from processing

JS framework data binding does a PUT on every change. Host always has latest data.



My thoughts and observations

- Not user upgradable
  - Seems to be getting fixed
- Windows Update can remove mandatory installation files
  - No evidence caused by Windows Defender
  - Something we're still investigating but have seen this in more than one instance now.
- Threading - Not really a bug but Dyalog can make this easier
  - Main thread DQ prevents event callbacks from being processed. HTTPRequest, WebSocketReceive, etc
- Windows use WebView2
  - Skip the 150mb of extra files.
- Authentication
- Authorization
- Terminology Grid => Datatable in JS

<= These are not the same thing!

New Development

```
'h'□wc'HTMLRenderer' ('URL' 'c:\myapp\index.html')
```

New Development

Web Server

Jarvis | Rumba |

Your own because you're an APL developer and couldn't help but to reinvent the wheel (again).

New Development

Web Server

Jarvis | Rumba | Your own because you're an APL developer and couldn't help but to reinvent the wheel (again).

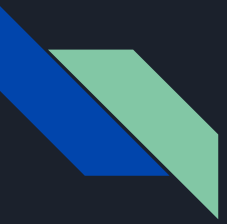
Why you ask?

- Separation of UI and Business Logic
- Testing… much easier testing an API (tools!)
- Easier to scale resources
- Cloud, Docker, Serverless, VM, Lambda
- UI/UX LIBRARIES!
- Native browser Responsiveness (PC, Phone, Tablet,.. TV)

HTML Responsive Web Design (w3schools.com)

"Responsive web design is about creating web pages that look good on all devices!

A responsive web design will automatically adjust for different screen sizes and viewports."



Demo!