WPF/Xaml on the Web

Christopher & Michael Hughes

MJH Software Services Ltd

Overview

MJH Software Services

WPF and ⎕WC/⎕WS/⎕WG both currently provide excellent GUIs for windows.

For WPF, XAML is best used to define the GUI, though Objects can also be used.

Data is manipulated by APL

Databinding (⍎2015) is used to connect the two together.

For ⎕WC/⎕WS/⎕WG the GUI is manipulated directly.

However good, both GUIs are currently only available on Windows based systems.
This excludes mobile apps, tablets, web browsers, Mac and Linux based systems.

The aim is to address this using a product from Userware (cshtml5.com) which compiles standard C# and XAML files into HTML5, Javascript and CSS files.

Freeing the Dyalog applications to run on other platforms using familiar GUIs.

The two presentations

MJH Software Services

1. **“WPF on the Web” will cover the principles of the design. And will demonstrate an application using XAML.**

2. **“□WC for the Web” will demonstrate a proto-type for an emulation of □WC/□WS/□WG.**

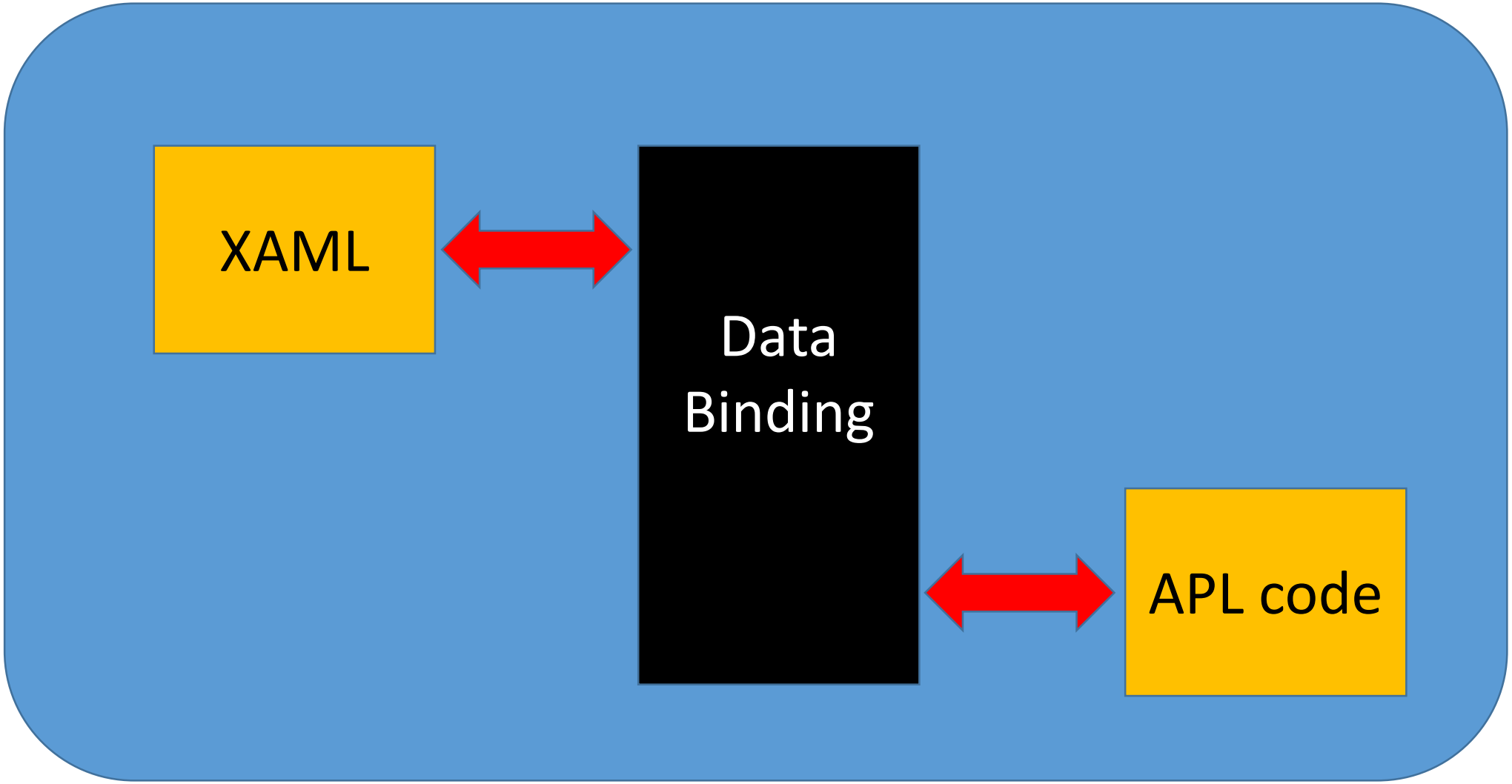
   This is a compiled stand-alone application using the methodology presented in the first presentation.

Definitions

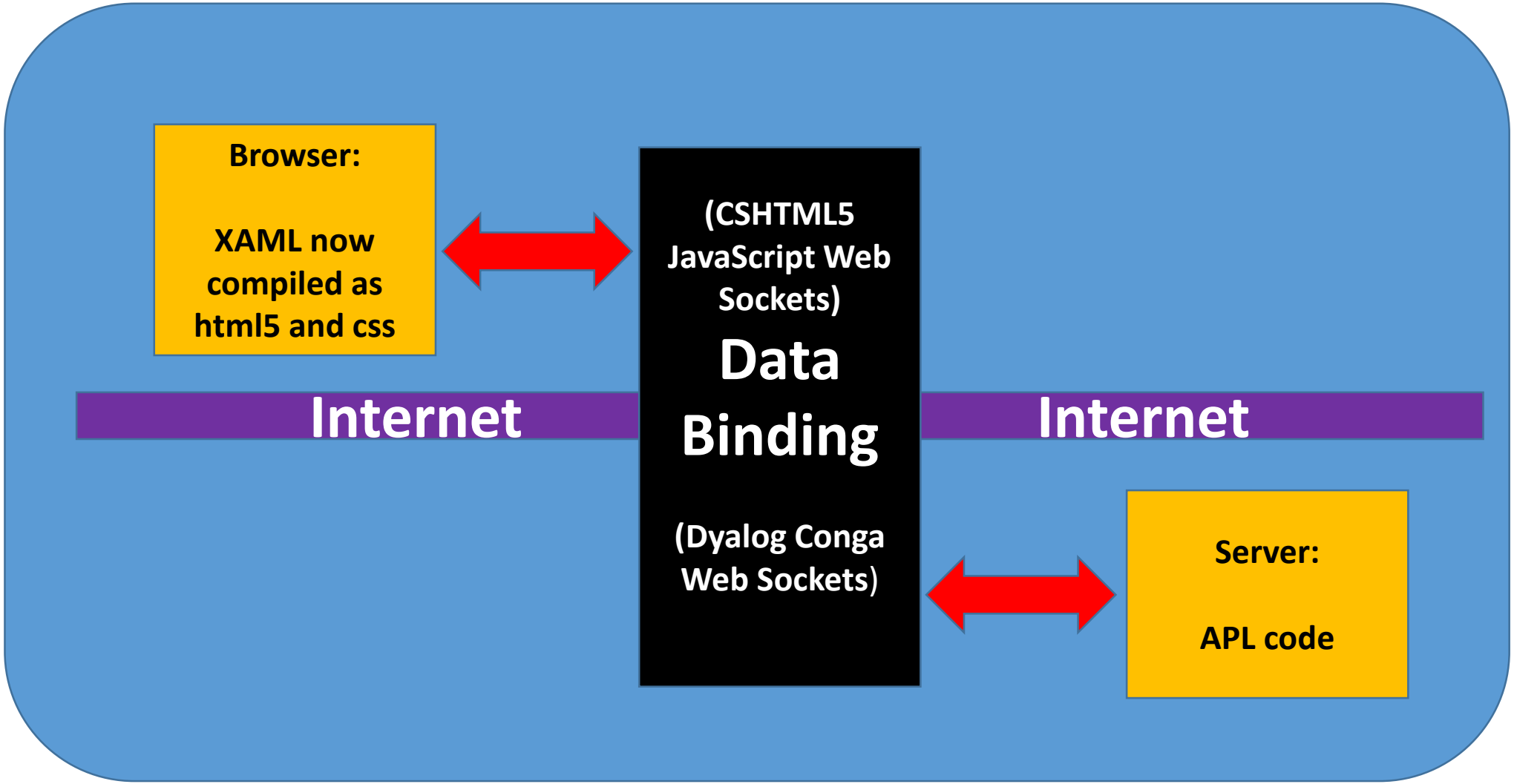
MJH Software Services

- **DataLibrary A collection of DataContexts, each connection works with 2 DataLibraries, one unique to a Single User or to Collaborating Users and one Common DataLibrary which is shared by all Users. Either DataLibrary may be empty. The user perceives the merged pair as a single DataLibrary.**
- **DataContext A collection of properties (values) which can be used as a source for Databinding. There is no limit to the number of DataContexts in a DataLibrary but their names (not there contents) must be unique when the two DataLibraies are merged. DataContexts are implemented as APL Namespaces on the server and C# classes at the client/browser end.**

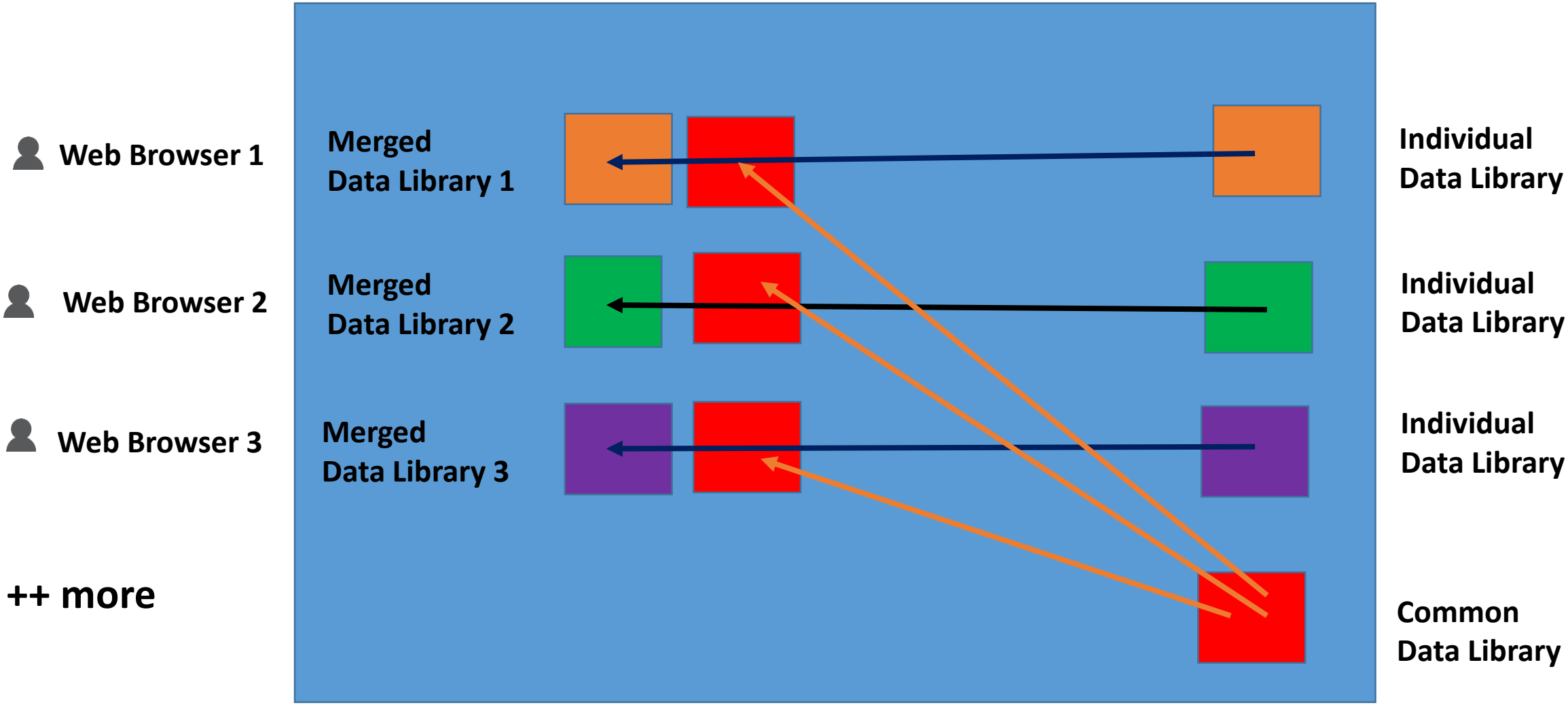
Dyalog WPF/Xaml on Windows



Dyalog WPF over the Web



Simple case


Web Browser 1
Web Browser 2
Web Browser 3
++ more
Merged
Data Library 1
Merged
Data Library 2
Merged
Data Library 3
Individual
Data Library
Individual
Data Library
Individual
Data Library
Common
Data Library

More complex case (collaboration)

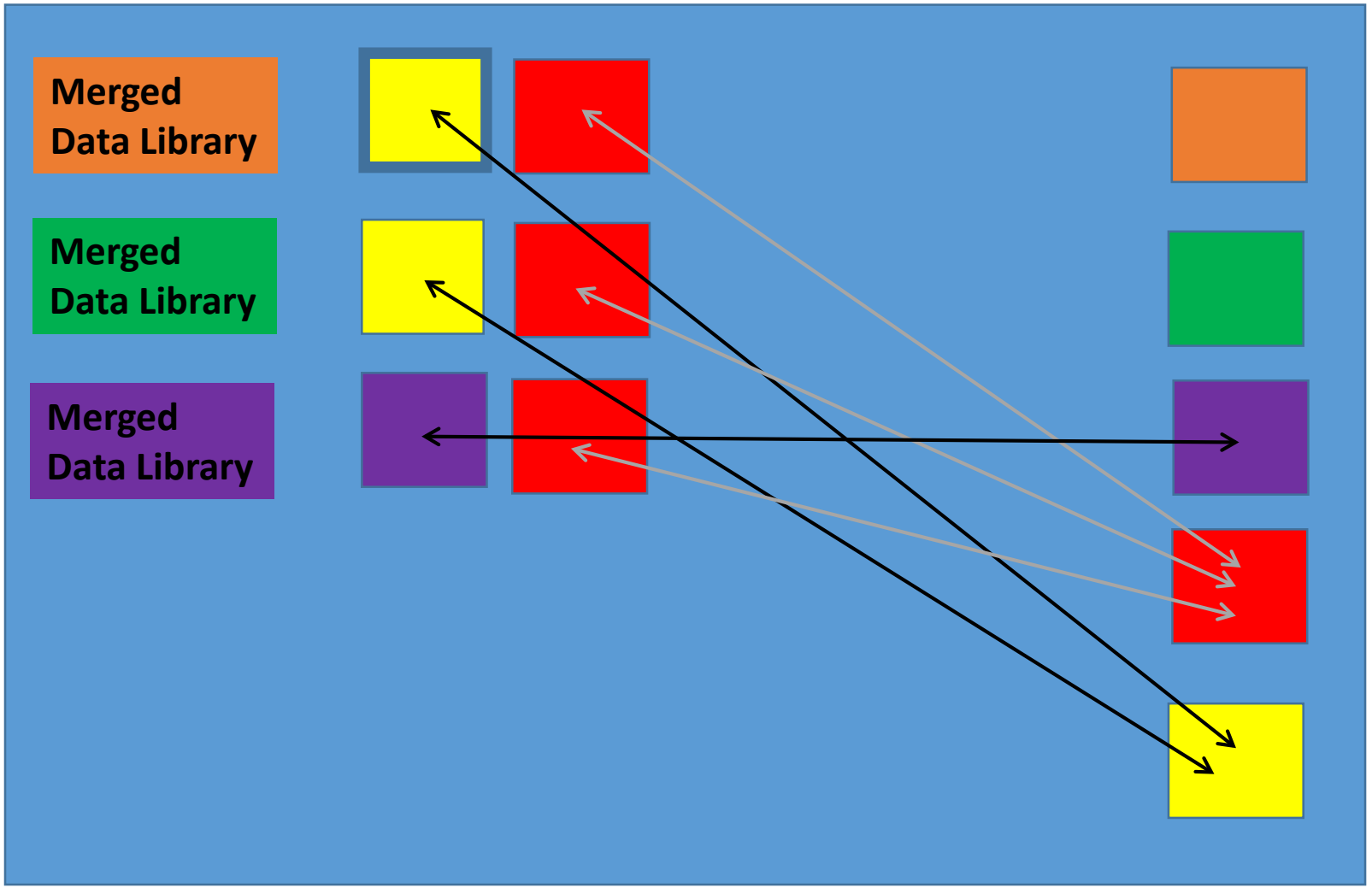
MJH Software Services

Web Browser 1

Web Browser 2

Web Browser 3

++ more



Individual DataLibrary

Non-referenced Individual DataLibrary

Individual DataLibrary

Common DataLibrary

Collaboration DataLibrary

Fast

MJH Software Services

All GUI processing is done at the browser end.

Screen definitions only sent once

Only very small commands sent to resize, move and manipulate.

Data can be paged.

Server only runs the APL application.

Persistency

MJH Software Services

Each DataLibrary is a single entity on the server.

Atomically stored in a Sharefile, (ie) one component per DataLibrary so one component per User.

Saved on a timer so any failures in communication links, etc. can be recovered.

Can allow for multiple components so possible history. Useful if neither collaborator wants to keep the final result of collaboration at end of collaboration. They can choose which version they want going forward.

Each component linked to a User name, Collaboration Name, or Temp Id for a guest (can be upgraded to User on authentication). So allows authenticated user to return to old session.

sharefile, one component per DataLibrary.
And will demonstrate an application using XAML.

Scalability

MJH Software Services

A single application workspace can support multiple users seamlessly as the system will switch the User's DataLibraries based on the connection Id (via UserId if authenticated or index of Communication Id if not) (one processed per & thread).

Multiple copies of the application workspace can be loaded on a single server (with a different port per instance)

Multiple copies of the application workspace can be loaded on multiple servers using a combination of different ip addresses and ports.

The vector of DataLibaries can be spread across the instances, the CSHTML5 Index.html file downloaded first at the start of the application instance can cycle through server/ports requesting if user limit reached or request a clean server/port instance for a fresh start.

Flexibility

MJH Software Services

It lends itself to cloud computing as more servers can be spun up / removed depending on load.

After an automatic save of the DataLibrary, the application can close the connection and open a new connection, either by direction or request cycling as before, and then reload the saved DataLibrary. In this case of a guest, the Temp Id of the User, can be used..

New list of available servers can be provided by request.

So if a server gets overloaded, fails or any other issue then a user can be moved to another seamlessly. (perhaps after a short delay).

Security

MJH Software Services

The application can be set up using either IIS or Appache using either their pass through mechanisms for Web Sockets (so only standard http/https ports need to be open through firewall).

Standard IIS/Apache security rules can be used.

UserId/Password only gives access to persisted DataLibraries. Authentication done by APL in server so can be as complex as required.

Https available through standard Conga certificate options.

Simple component file can be replaced by any file system providing APL namespaces can be stored.

Robust

DataLibraries are stored on a regular timing pattern (or when a loss of connection is detected – the application Server will still be running even if the browser loses contact.

Component files can be backed up.

Component files can be locked

Component files can be dislocated (as per DFS)

Future Proofed

MJH Software Services

What about WASM (Web Assembly)?

All major browsers are committed to supporting it.

Userware are committed to supporting it – they have a proto-type already. So their compiler will output HTML5/Javascipt/CSS for older browsers and Web Assembly for modern browsers. So this approach continues to be supported on the latest platforms.

At last

MJH Software Services

The demo ……