Cross-platform User Interfaces

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(Big) Bets We Are Placing

1. Parallel Processing is getting Critical
2. New Platforms will soon be Important
3. Most new User Interfaces will use either HTML5/JS or WPF/XAML
2. New Platforms

- UNIX variants
  - ARM Linux (Raspberry Pi), Apple OSX, Android

- Windows variants without Win32
  - UWP, New Servers, Windows for ARM

- Our new tools are designed to be cross-platform
  - RIDE, MiServer, SAWS, R-Connect, DyaCrypt
  - Some old ones too: Conga, SQAPL, …

- Our goal is to allow future apps to be developed on (any) one platform and deployed on (any) other
3. User Interfaces

- Cross-platform apps will use HTML5 and Javascript to define the user interface (for at least 5 years).

- Some New Microsoft Desktop and UWP apps will use WPF. UWP is also XAML-based.
  - WPF and ”UWP” will morph into a single toolset.

- We will support data binding and ”MVVM” style application building with both these tools.

- We are looking at embedded HTML5/JS rendering engines to allow the same UI to service Web and Desktop or ”Phablet” applications.
Dyalog-Supported UI Technologies

All of the following are being actively enhanced:

- **Win32 / ⎕WC**
  - Occasional addition of features on demand, like support for touch & high DPI screens - underlying platform is now ”stable”

- **Windows Presentation Foundation => UWP**
  - DataBinding and other .NET interface enhancements
  - Syncfusion Controls bundled with Dyalog APL
  - Working with Michael Hughes on tools and training materials

- **HTML5/JavaScript**
  - MiServer
  - Syncfusion Controls bundled with Dyalog APL
MiServer Growing Up

- Has been coming for some time
  - Stefanos WildServer
  - Mortens MildServer 1.0
  - Brians MiServer 2.0
  - Adám, Dan, Morten - but still mostly Brians
    MiServer 3.0

- Each was usable to a larger group than before
- With MiServer 3.0 we think everyone can play
What is MiServer?
Well... First - What is ⎕WC?

• A set of classes for creating GUI

`'F1'⎕WC'Form' 'Hello World'('Coord' 'Pixel')('Size'(70 300))
'F1.label'⎕WC'Label' 'Please enter your name'(10 10)
'F1.name'⎕WC'Edit' ''(10 170)(0 100)
'F1.done'⎕WC'Button' 'Done'(10 300)
'F1.done'⎕WS'Event' 'Select' 'CallbackFn'
'F1.result'⎕WC'Text' ''(40 10)

↓ CallbackFn
   F1.result.Text←'Hello, ,(F1.name.Text),''!

↓
What is MiServer?

- A set of classes for creating GUI

```apl
F1←Add _.Form ◆ Add _.Title 'Hello World'
('for' 'name') F1.Add _.label 'Please enter your name'
'name' F1.Add _.EditField
done←'done' F1.Add _.Button 'Done'
done.On 'click' 'CallbackFn'
'result' F1.Add _.div
∇ r←CallbackFn
:Access Public
r←'#result' Replace _.p ('Hello, ','(Get'name'),'!')
∇
```

![MiServer 3.0](image)
Cross-Platform User Interfaces

'F1'⎕WC'Form' 'Hello World'('Coord' 'Pixel')('Size'(70 300))
F1←Add _.Form ◇ Add _.Title 'Hello World'

'F1.label'⎕WC'Label' 'Please enter your name'(10 10)
('for' 'name') F1.Add _.label 'Please enter your name'

'F1.name'⎕WC'Edit' ''(10 170)(⍬ 100)
'name' F1.Add _.EditField

'F1.done'⎕WC'Button' 'Done'(10 300)
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∇ CallbackFn
F1.result.Text←'Hello, ,(F1.name.Text),'!
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Let’s Take a Look

• The MiServer Home Page
  http://miserver.dyalog.com
Uses of MiServer

At Dyalog’15

• (U06) Ants, AJAX and APL
  Ray Cannon

• (U13) TamStat, a Statistical Package
  Steve Mansour & Jerry Brennan

• A demonstration UI build for a new insurance application:
  http://127.0.0.1:8081
Automated Testing with Selenium

- Selenium is a cross-platform tool for web UI testing
- `c:\devt\Selenium\selenium.dws`
How to Get Started?

• Get it from [https://github.com/Dyalog/MiServer](https://github.com/Dyalog/MiServer)

)LOAD miserver.dws
Start 'MS3' A The sample site
]open [http://127.0.0.1:8080](http://127.0.0.1:8080)
Not Only Web Applications

Dyalog APL Server

MiServer or other HTML/JS Generator

Internet

Web Browser

c:\dropbox\Dyalog15\cefsimple\Release\loadurl.dws

Dyalog APL + RIDE
(Windows, UNIX, Mac, Android, etc)

MiServer or other HTML/JS Generator

HTML Engine
What else is MiServer?

- A set of classes for creating GUI plus...
- A Web Server to deliver content to Web Browsers
  - And receive input from browsers
- Classes for delivering Web Services to application clients which render own GUI
  - "SAWS" is being integrated with MiServer and will also support RESTful web services
- A Framework for multi-user application deployment

C:\devt\miserver\ms3
Summary – Cross Platform UI

- With version 3.0, MiServer is ready for use by “anyone who can write an APL function”
- Dan & Adám will present the growing library of supported Controls or “Widgets” tomorrow
- Easy to use by non-technical developers but easy for experts to extend using Javascript etc
- You can start writing apps that will render UI’s from Windows, Linux, AIX & OSX now!
- Android, UWP and iOS “soon”
Cross Platform

• From Cross Platform UI to Cross Platform File Functions

... Next up is Richard Smith