Introducing Dyalog version 18.2

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Release Dates & Windows Patches

- 18.2 was released to DSS Users on March 10th
  - DSS = Dyalog Support Service
- Every one else by Weds March 23rd

- Updates to be delivered as Microsoft Patch files (MSP) under Windows
  - Allows patching ALL components of Dyalog installation including APL code & docn
  - (was already the case on all other platforms)
Basic Licence

Intended for
- non-commercial use
- education
- personal projects
- experiments
- sharing your experience
- proof of concepts / trials
- participating in programming competitions for cash prizes
- fun
Basic Licence

- Replaces *non-commercial licence*
- Allows distribution of Dyalog along with your work, under the default royalty licence
  - Fee is 2% of gross APL-based revenue
  - No fees due if revenue < GBP 5,000 in a calendar year
  - Multiple alternative commercial licence schemes are available
- For GBP 150 per year, you can subscribe to the Dyalog Support Service (DSS)
Launching from Text Files:

Shell Scripts

- `/usr/bin/dyalogscript` is the script interpreter
- Under Windows, `.apls` files are associated with `dyalogscript`

```
#!/usr/bin/dyalogscript
IO-O
ReadInputLines={1005::ω υ,♂} a Read input until EOF
input-cReadInputLines Op::'
input-DUCS t33 a Remove all controls chars including space
freq(a,قوا)Br a Use key to count occurrences
U-freq[&/freq;] a Sort by descending frequency
```

```
mkrom@munin:~$ cp /mnt/c/tmp/aplscripts/freq.apls .
mkrom@munin:~$ echo "mississippi" > mississippi.txt
mkrom@munin:~$ ./freq.apls < mississippi.txt
i 4
s 4
p 2
m 1
```

```
C:\tmp\aplscripts\freq.apls
```

```
C:\tmp\aplscripts>Freq.apls "mississippi.txt"
14
s4
p2
m1
```

```
C:\tmp\aplscripts>
```
Launching from Text Files:

Text Source – Link 3.0

- Completely new documentation
  https://dyalog.github.io/link/3.0/
- Many small features and bug fixes
  https://dyalog.github.io/link/3.0/ChangeHistory/
  https://github.com/Dyalog/link/issues?q=is%3Aissue+is%3Aclosed

Most significant new features:
- )SAVE workspaces with active links and resynchronise on Load
- Support for system variable settings in source files
- Cleaner, documented API
Introduction

Link enables users of Dyalog to store their APL source code in text files. This is the documentation for Link Version 3.0, which will be released in the autumn of 2021 and included with the next release of Dyalog APL. If you have an earlier version of APL or Link, you might want to read one or more of the following pages before continuing:

- **Link version 2.0** If you are actually looking for documentation of the version which was distributed with Dyalog APL versions 17.1 and 18.0.
- **Migrating to Link 3.0 from Link 2.0** Dyalog recommends migrating to version 3.0 at your earliest convenience.
- **Migrating to Link 3.0 from SALT** If you have APL source in text files managed by SALT that you want to migrate to Link.
- **Installation instructions** If you want to download and install Link from the GitHub repository rather than use the version installed with APL, for example if you want to use Link 3.0 with Dyalog version 18.0.
- **The historical perspective** Link is a step on a journey which begins more than a decade ago with the introduction of SALT for managing source code in text files, as an alternative to binary workspaces and files, and will hopefully end with the interpreter handling everything itself.

**Audience**
Launching from Text Files:

Supported in 18.0:

- Function file
- Namespace file
- Class file

LOAD Parameter

Windows:
```
dyalog.exe LOAD=/myapp/foo.aplf
```

Linux:
```
LOAD=/myapp/foo.aplf dyalog
```
Launching from Text Files:

**Supported in 18.0:**
- Function file
- Namespace file
- Class file

**New in 18.2:**
- Namespace directory
- Calls function Run unless \(-x\) set

**LOAD Parameter**

**Windows:**
```
dyalog.exe LOAD=/myapp
```

**Linux:**
```
LOAD=/myapp dyalog
```
Windows Explorer Integration

Context menu:
- Edit
- Load with Dyalog
- Run with Dyalog

]File Associations
user command has been enhanced
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fileAssociations status

Status for ALL users

Installed instances are:

18.2U64 18.2C32 18.0U64 17.1U64 17.1C32 16.0U64

Current associations:

Directories 18.2C32 (menu items shown)
Source Preview 18.2U64 (enabled)
Workspace Preview 18.2U64 (enabled)
dcfg 18.2C32 default action is Edit
dws 18.2C32 default action is Run
dyalogscript 18.2C32 default action is Run
dyapp 18.2C32 default action is Run
source 18.2C32 default action is Edit

Selected instance: 18.2 Unicode-64
Backup written to C:/Users/mkrom/AppData/Local/Temp\efa-b0 deleted, 33 set. User = all.

Edit File Associations

Current associations for ALL users:

- Scripts (.apls) 18.2U64
- Sources (.apil, .dyalog) 18.2U64
- SALT apps (.dyalog) 18.2U64
- Workspaces (.dws) 18.2U64
- Directories 18.2U64
- Preview 18.2U64

Select instance to associate:

- 18.2 Unicode-64
- 18.2 Classic-32
- 18.0 Unicode-64
- 17.1 Unicode-64
- 17.1 Classic-32
- 16.0 Unicode-64

- Show Windows Explorer context menu items for directories
- Create a backup of the relevant registry settings

Set associations for: All users

Apply  Cancel
Docker Support

- Launch containers on source files
- Public containers under Basic Licence:

If you publish containers derived from the public Dyalog containers you MUST include our LICENSE file in a prominent location.
RIDE v4.4

- Debug multi-threaded applications
- Language bar and help adapts to Dyalog version
- Save responses to prompts
- ... and many more tweaks and fixes, see https://github.com/Dyalog/ride/milestone/4?closed=1
RIDE 4.4 Highlights
RIDE 4.4 Highlights

- Fix as code in the workspace
  Create objects in the workspace, and update the file

- Only save file to disk
  This won’t affect the contents of the workspace

- Discard changes

- Save this response for all files with a "txt" extension

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Developer Productivity: 

**JSON tables/datasets**

```
fields ← 'Item' 'Price' 'Qty'
items ← 'Knife' 'Fork'
price ← 3 4
qty ← 23 45
fields⍪⍉↑items price qty
```

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knife</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Fork</td>
<td>4</td>
<td>45</td>
</tr>
</tbody>
</table>

```
cols ← items price qty
table ← ⊂4(cols fields)
(⎕JSON⍠'Compact'0)table
```

```js
[
  {
    "Item": "Knife",
    "Price": 3,
    "Qty": 23
  },
  {
    "Item": "Fork",
    "Price": 4,
    "Qty": 45
  }
]
```
Developer Productivity:

D{ATX} metadata one-stop-shop

Unifies:

- ⎕SIZE  Size of Object
- ⎕NC  Name Classification
- ⎕NR  Nested Representation
- ⎕SRC  Source
- ⎕AT  Attributes
- 5179 Insets Loaded Object Info

Additional metadata:

- Last edit UTC
- Source "as typed"
- Normalised source
- Best available source
- More to come...
Developer Productivity: Generating random numbers

```
Dist ← 16808π
val ← 2 5 Dist 'Beta' 1e5
res ← 100
bin ← ⌊res×val
x ← ~1+1res
y ← {≠⍵}⌸x,bin
]plot y x
```
New Win32 GUI (⎕WC) features!!!

- CornerTitleBCol on Grid
- FireOnce on Timer
Developer Productivity: New user commands

]get github.com/mkromberg/linkdemo/tree/main/stats
Developer Productivity: New user commands

]get github.com/mkromberg/linkdemo/tree/main/stats

Working on it...
Developer Productivity:

New user commands

]get https://github.com/mkromberg/linkdemo/tree/main/stats

Working on it......

#.stats

stats.inds←1 1 3

]names 0

2: bin res val x y   3: Dist   9: stats

]names stats

stats.Mean stats.Root stats.StdDev
Developer Productivity:

New user commands

```
aplcart general mean

Ms(⊢*∘÷⍨1⊥*⍨÷⊢∘≢)N Generalised mean
Ms{(+/⍵*⍺)÷≢⍵)*÷⍺}N Generalised mean
```

Showing 2 of 2 matches

```
GM←{(+/⍵*⍺)÷≢⍵)*÷⍺}
1 GM 1 2 3 4 A Average
2.5
2 GM 1 2 3 4 A Quadratic Mean
2.738612788
¯1 GM 1 2 3 4 A Harmonic Mean
1.92
```
Developer Productivity:

New user commands

```dyalog
]repr (3 4⍴⍳12) -format=json
[[1,2,3,4],
 [5,6,7,8],
 [9,10,11,12]]

]repr (3 4⍴⍳12) -format=xml
<array>
 <shape>3 4</shape>
 <list>1 2 3 4 5 6 7 8 9 10 11 12</list>
</array>
```
Developer Productivity:

New user commands

```
]repr (3 4ρ12) -format=apl
(3 4ρ1+∘io−~ι12)

GM←*o÷~1⊥*~÷1o≠

]repr GM
GM←((*o÷~)(1⊥((*~)÷(≠o)))

]view ]repr GM
```
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