

APL64 Update 2024.0.1

Table of Contents

Overview	4
Interpreter Modifications	4
☐ wi improvements	4
APL64 Colossal file functions were ported to APL64 from APLNow32.....	4
☐ tt32 System Function: High-Resolution Timer Tick Count for APLNow32 operations.....	4
☐ ZIP system function.....	4
System variable ☐ SYS[21] value is 1 when the APL64 is runtime.....	4
)RSAVE system command now reports DEPRECATED FEATURE.....	4
☐ ROWFIND performance improved when left and right arguments are in ☐ AV	4
☐ SKD: ToFile/FromFile actions removed.....	5
☐ STRING updated.....	5
APL64 Developer Version GUI Modifications	5
Option to Suppress Command Line	5
Bookmarks are supported in the Editable Classic History Format.....	6
'Find Next Bookmark' keyboard shortcut modified to Alt+F2 from F2.....	6
Line numbers in the history format and session editors have been enhanced.....	7
Find next/previous executed line options now supported in editable Classic History format.....	8
Find tool and search keyboard shortcuts for Token and Word searches improved	8
☐ CSE documentation consolidated	9
Option to suppress callback information in the history pane	9
☐ nfe 'delete' action exception message improved	10
Objects Row Numbers menus improved	10
Objects Tool Bars menus improved	10
☐ ABOUT and ☐ PR system variables now report DEPRECATED FEATURE.....	10
Update to Fetch Object tool to support large matrices.....	10
New Session Suppress Unassigned History Output From Quote-Quad Output menu	11
New Session Classic History Format Fresh For Accurate History menu.....	11
The editable classic History supports the Session Use Selected Text on Enter in History menu.....	11
CPC and WRE.....	11
Digital code signing available for an APL64 Windows Runtime Exe and Cross-Platform Component ...	11

Materialize additional file to the path where the WRE exe is installed, rather than the path where the WRE dll is running	12
Materialize the APLNow32 ini and adf files, if included in the WRE, to the path where the WRE dll is running.....	12
The 'Add Folder of Required Files' button to add files in a folder and all sub-folders in the Additional Files Required for the Application area	12
The 'Remove All Required Files' button to remove all files listed in the Additional Files Required for the Application area.....	12
☐ CPC documentation consolidated.....	12
Bug Fixes	14
Function Editor: Wrong error message: Cannot save function definition {aplFnInfo.FnName}	14
Outlining glyphs in the margins sometimes didn't appear in a function editor	14
☐ LIBD did not create library definition for network sources	14
Options Libraries... menu: Configuration initialization failed: Cannot serialize to XML	14
☐ LIBD LIBRARY NUMBER ERROR when library definition was not left justified	15
Case was retained for ☐ libs and)libs for mixed-case library definition.....	15
Extra space between library number and workspace name: WS NOT FOUND	15
Ctrl+A then Ctrl+X in non-editable Classic Session History return an error	15
Accessing help file with no Internet connection: Configuration initialization failure exception.....	16
WRE Publish output log file contained messages referencing SpreadsheetGear	16
WRE failed to load APLNow.X64.dll in APL64 runtime system	16
Empty array assigning caused INDEX ERROR.....	16
Save a function (Ctrl+S) with auto indented spaces exception	16
Function editor exception with :IF and :ANDIF or :ORIF control structures.....	17
0 ☐ inbuf 'Default Value' ♦ X← ☐ deadlocked APL64.....	17
Starting the Find in Functions in Workspace utility closed the APL64 instance	17
The APLGrid with xGripOptions=256 showed the dropdown list turn to black	17
Stepping in the debugger a line at a time (F10) didn't show the current line.....	17
☐ EDSS description incorrectly specified in the APL64 system functions documentation	17
The current)output state wasn't reset to ON after the)clear command.....	17
The current)output state wasn't saved in the workspace	17
Fetch Object operation in a function editor was not successful for a large numeric matrix	17
Debugger Pause toolbar did not suspend a function and activate the debugger	17
☐ wi HELPSTRINGS.txt documentation was not included in APL64 production release	17

Overview

This document describes the enhancements and bug fixes that are planned for the next production release of APL64.

Interpreter Modifications

[□wi improvements](#)

□wi system in APL64 was redesigned for better performance and a more responsive Windows-targeted application GUI.

[APL64 Colossal file functions were ported to APL64 from APLNow32](#)

Benefits of this modification are:

- Use native data serialization to support new APL64 data types such as string and char
- Add support for case sensitive file systems in cross-platform-targeted applications.

[□tt32 System Function: High-Resolution Timer Tick Count for APLNow32 operations](#)

Purpose: Returns the number of ticks for all APLNow32 operations (□wi and □wcall) since the start of the APL64 session to the time the value of □tt32 was obtained.

Refer to the topic [□tt32](#) in the **Help | APL Language | APL64 System Functions** in APL64 for the details.

[□ZIP system function](#)

The □ZIP APL64 system function is an interface to the cross-platform compatible [.Net System.IO.Compression](#) tools. The □ZIP system function actions involve zip-format files. Since file operations are involved, the user's workstation credentials must be appropriate for the actions to be performed by □ZIP.

Refer to the topic [□zip](#) in **Help | APL Language | Using □ZIP** in APL64 for the details.

[System variable □SYS\[21\] value is 1 when the APL64 is runtime](#)

When APL64 is running as a WRE (Windows runtime executable) or a CPC (Cross platform), the value of □SYS[21] is 1.

[\)RSAVE system command now reports DEPRECATED FEATURE](#)

)RSAVE system command is deprecated in APL64. This message is more descriptive than INCORRECT COMMAND.

[□ROWFIND performance improved when left and right arguments are in □AV](#)

☐SKD: ToFile/FromFile actions removed

Microsoft has deprecated these actions, so they're no longer supported in ☐SKD. Use the FromFileXml and ToFileXML ☐SKD actions instead. Before updating APL64, use the ☐SKD 'FromFile' action followed by the ☐SKD 'ToFileXml' action to convert any stored ☐SKD dictionaries to the XML format.

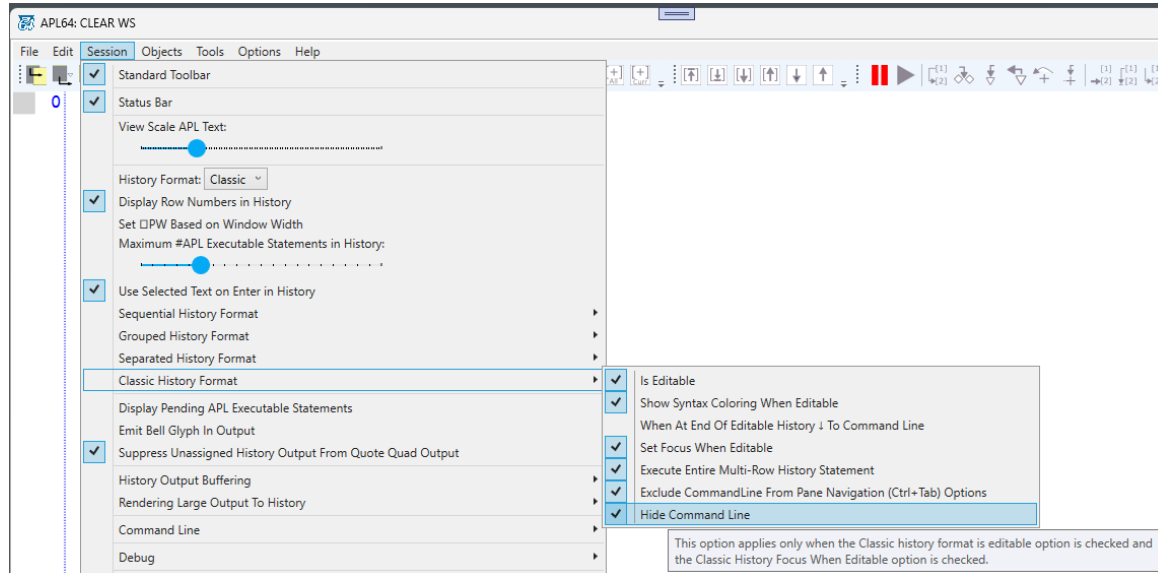
☐STRING updated

- ☐String '?' documentation summary corrected
- A ☐String action which accepts a String left argument will also accept a rank 0 or 1 character value left argument, which is converted to a String.
- A ☐String action which accepts a String[] vector left argument will also accept a vector left argument with elements which can be a string scalar or rank 0 or 1, character values which are converted to String.

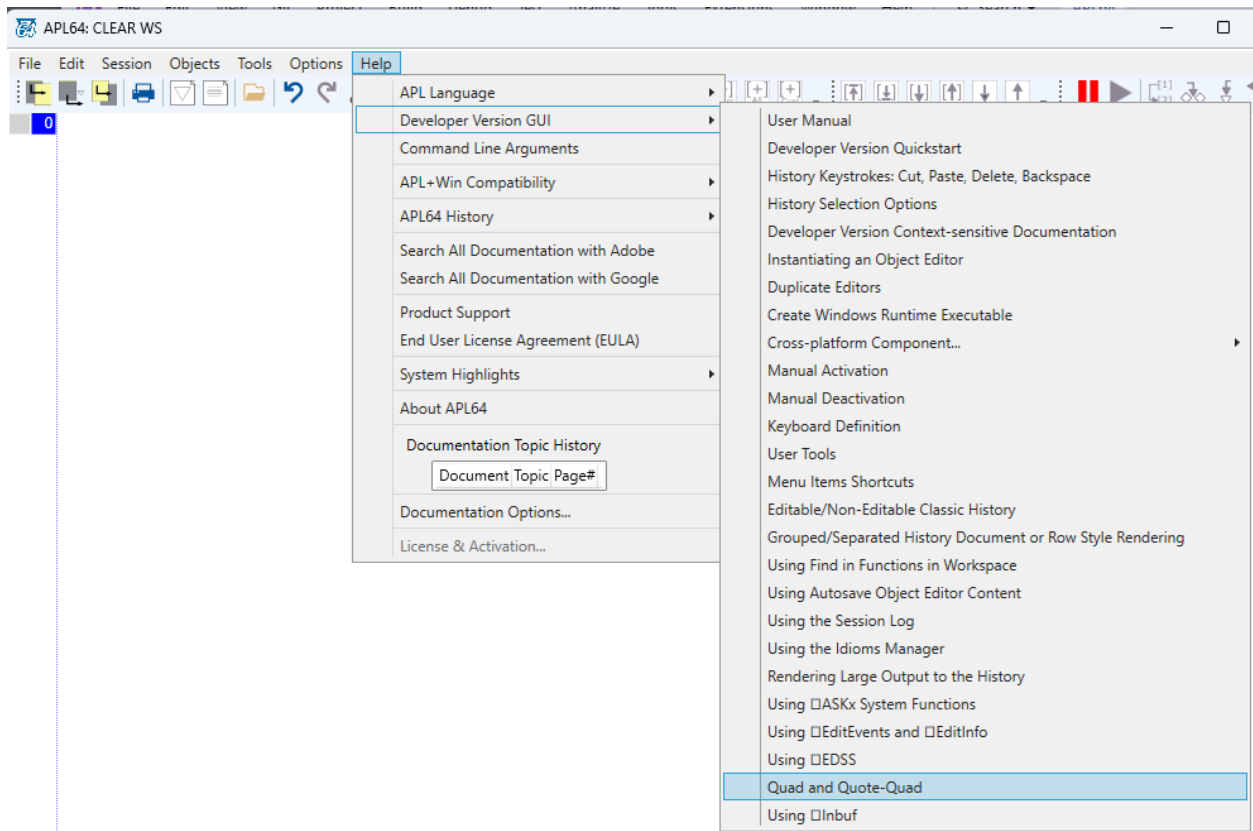
APL64 Developer Version GUI Modifications

Option to Suppress Command Line

Initial versions of the APL64 developer version Quad and Quote-Quad input were dependent on the Command Line in the APL64 Developer version. This dependency has been eliminated, so that the APL64 programmer may hide the Command Line (only when the editable Classic history format is used) by enabling the menu item **Session | Classic History Format | Hide Command Line**.



Providing an option to suppress the command line required modifications to the behavior of quad and quote-quad in APL64. Review the **Using Quad and Quote-Quad** programmer documentation for important information and examples.

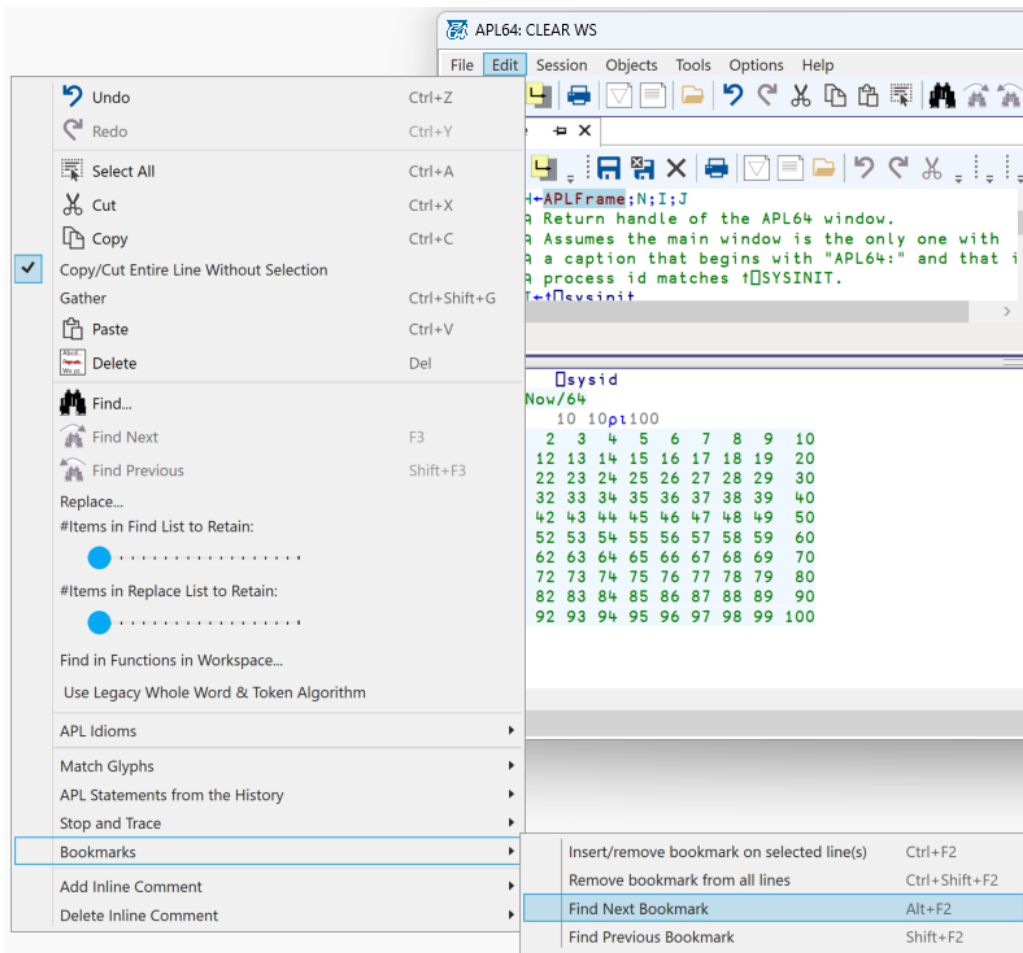


Bookmarks are supported in the Editable Classic History Format

This feature is available when enabling the menu item **Session | Classic History Format | Show Syntax Coloring When Editable**.

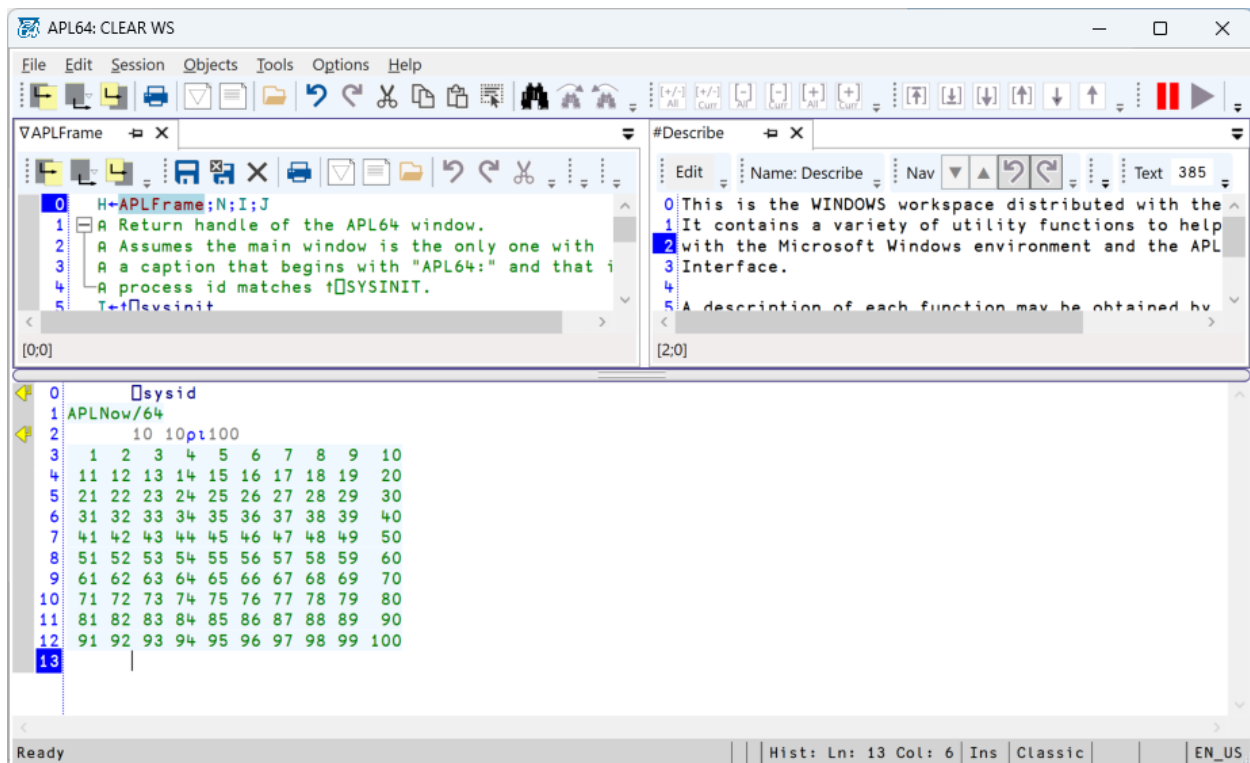
'Find Next Bookmark' keyboard shortcut modified to Alt+F2 from F2

The purpose of this change was to support the keyboard shortcut in the Sequential history format.



Line numbers in the history format and session editors have been enhanced

The user-selected foreground and background colors for line numbers are reversed for the line number with the cursor to provide a visual cue indicating the position of the cursor.

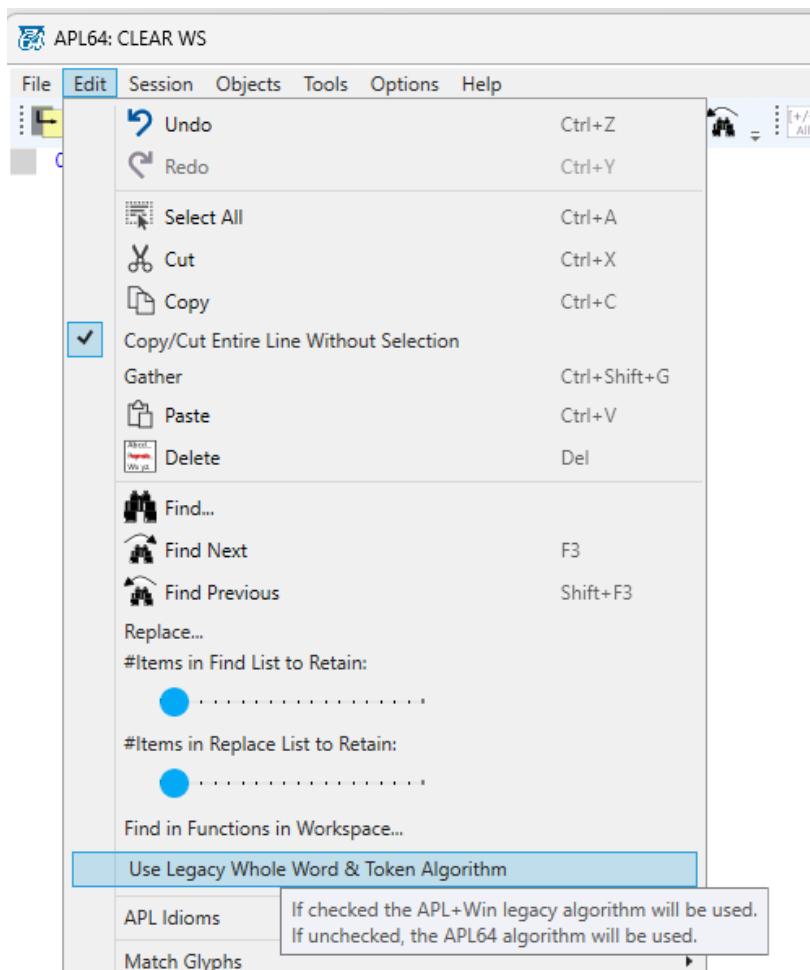


Find next/previous executed line options now supported in editable Classic History format

The Find next and previous executed line menu options and their corresponding keyboard shortcuts, Alt+F9 and Shift+Alt+F9, respectively, are now supported when the Classic History format is editable.

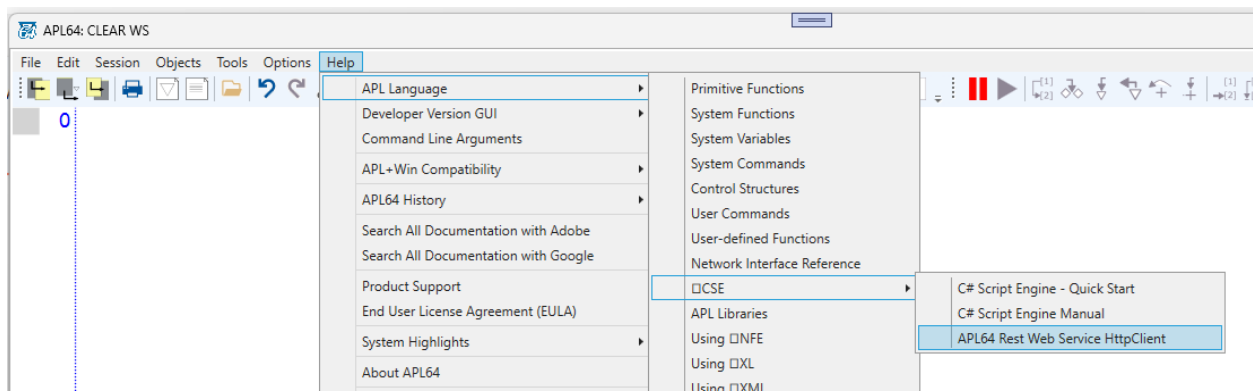
Find tool and search keyboard shortcuts for Token and Word searches improved

For better APL+Win compatibility the menu item **Edit | Use Legacy Word & Token Algorithm** is enabled by default in APL64. This option applies to the Find tool, Ctrl+F3 and Ctrl+Shift+F3 keyboard shortcuts with and without a selection. Uncheck this menu item to use the APL64 algorithm.



☐ CSE documentation consolidated

The menu item **Help | APL Language | ☐ CSE** now contains all ☐ CSE programmer documentation. The new **APL64 Rest Web Service HTTPClient** topic illustrates how to use the ☐ CSE system function to access a REST web service from APL64 ☐ CSE and use .Net assemblies which are published in a Nuget package.



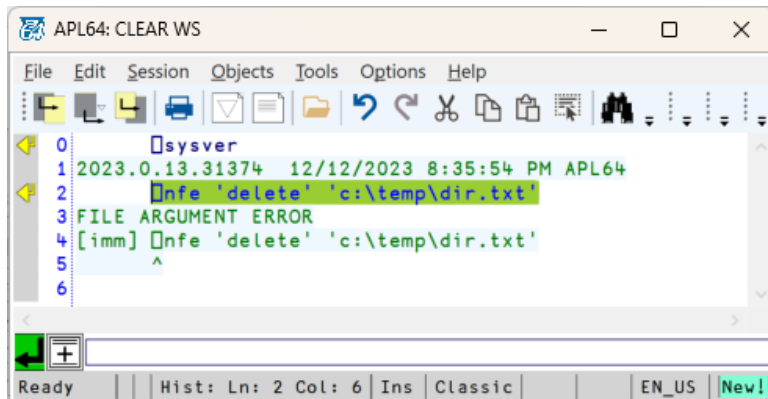
Option to suppress callback information in the history pane

Use the APL64 system command 'output nocallback' to suppress callback information in the APL64 developer version history pane. In APL64 callbacks generate information with an **>[object;event]** prefix

on the executable statement which caused the callback. Displaying this cause-and-effect information maintains an accurate history of what occurred in an APL64 instance. Callbacks include execution of a user-entered APL executable statement, interpreter callbacks, invocation of a user-defined tool and ☐wi events.

☐nfe 'delete' action exception message improved

Behavior in the prior version:

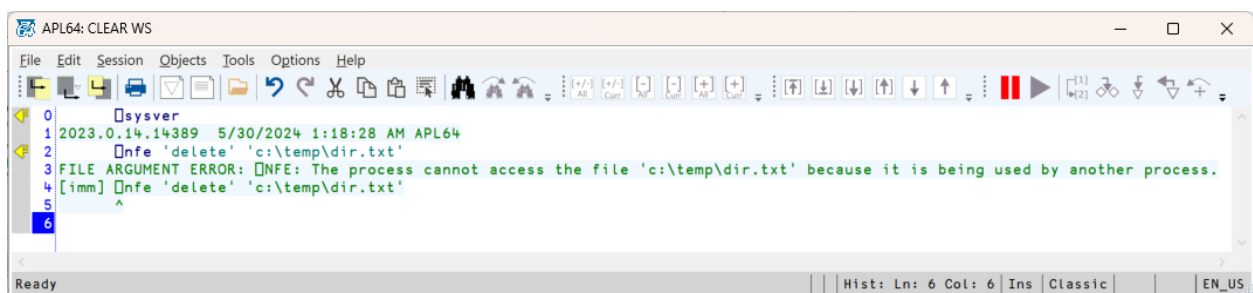


The screenshot shows the APL64: CLEAR WS window. The menu bar includes File, Edit, Session, Objects, Tools, Options, and Help. The toolbar contains various icons for file operations and editing. The main text area displays the following code and output:

```
0 ☐sysver
1 2023.0.13.31374 12/12/2023 8:35:54 PM APL64
2 ☐nfe 'delete' 'c:\temp\dir.txt'
3 FILE ARGUMENT ERROR
4 [imm] ☐nfe 'delete' 'c:\temp\dir.txt'
5 ^
6
```

The status bar at the bottom shows 'Ready', 'Hist: Ln: 2 Col: 6', 'Ins', 'Classic', 'EN_US', and a 'New!' indicator.

New behavior in this version:



The screenshot shows the APL64: CLEAR WS window with a more detailed error message. The menu bar and toolbar are the same as in the previous screenshot. The main text area displays the following code and output:

```
0 ☐sysver
1 2023.0.14.14389 5/30/2024 1:18:28 AM APL64
2 ☐nfe 'delete' 'c:\temp\dir.txt'
3 FILE ARGUMENT ERROR: ☐NFE: The process cannot access the file 'c:\temp\dir.txt' because it is being used by another process.
4 [imm] ☐nfe 'delete' 'c:\temp\dir.txt'
5 ^
6
```

The status bar at the bottom shows 'Ready', 'Hist: Ln: 6 Col: 6', 'Ins', 'Classic', 'EN_US'.

Objects | Row Numbers menus improved

The **Objects | Row Numbers | Display Row Numbers in Function Editor** and **Objects | Row Numbers | Display Row Numbers in Function Editor** submenus were moved into their respective **Objects | Variable Editor** and **Objects | Function Editor** menus since the row numbers are optional features in the variable and function editors.

Objects | Tool Bars menus improved

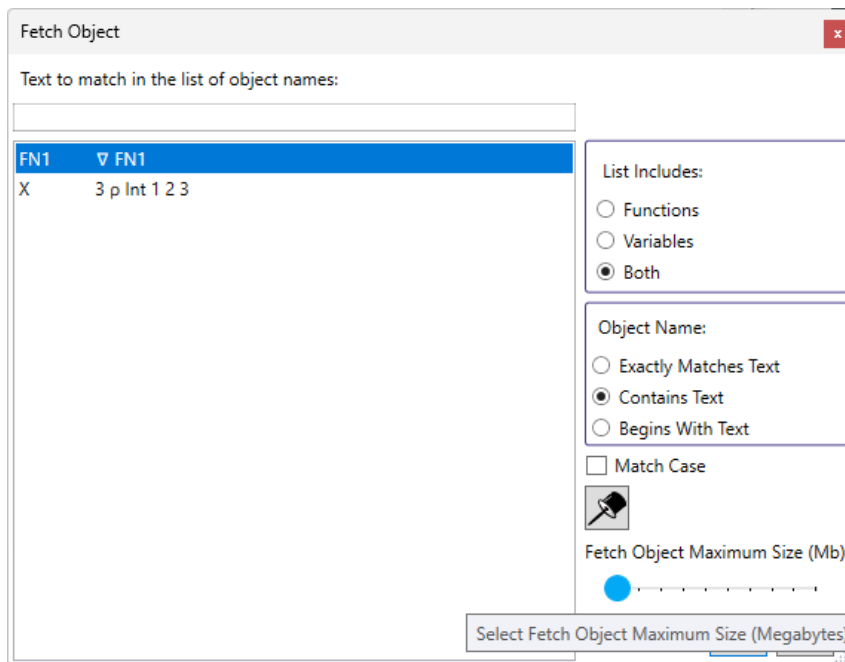
The **Objects | Tool Bars** submenus were moved to the **Objects | Function Editor** and **Objects | Variable Editor** menus.

☐ARABOUT and ☐PR system variables now report DEPRECATED FEATURE

☐arabout and ☐pr are legacy system variables are deprecated in APL64. In APL64 the result of Quote-Quad query or input never includes the programmer-defined prompt text.

Update to Fetch Object tool to support large matrices

The new **Fetch Object Maximum Size** option may be used to specify the maximum size for an object that is fetched. The default value is 100Mb.



[New Session | Suppress Unassigned History Output From Quote-Quad Output menu](#)

This option specifies when to display the quote-quad output value when assigned to the history. Quote-quad output can always be assigned. The APL+Win behavior (unchecked) is that even if quote-quad output is assigned, the quote-quad output value is rendered to the history. For some uses of quad input, the suppression (checked) behavior is appropriate.

[New Session | Classic History Format | Fresh For Accurate History menu](#)

This menu option will refresh the editable classic history pane by removing any programmer scratch-pad text that has not been executed.

[The editable classic History supports the Session | Use Selected Text on Enter in History menu](#)

This setting controls the behavior for selected and unselected text in the editable classic history when Enter or Return is pressed.

CPC and WRE

[Digital code signing available for an APL64 Windows Runtime Exe and Cross-Platform Component](#)

An option is provided to digitally sign an APL64 WRE (Windows runtime executable) and CPC using an APL64 programmer-provided digital signature certificate. An application should be digitally signed to indicate that the application as delivered to the end user came from the application publisher (e.g. APL programmer). Use the optional digital signature section of the Create Windows Runtime Executable dialog for this purpose. Refer to the document in **Help | Developer Version Gui | Create Windows Runtime Executable** for the details.

APL64: Create Windows Runtime Executable

Runtime Workspace Filename: *

EXECUTABLE CONTENT

Runtime Windows Executable Target Folder: *

Runtime Executable Name: * ☒ Same as Runtime Workspace Name

☐ Digitally sign output

Digital signature key file:

Digital signature key file password:

Timestamp server url:

APL64 xml-format Configuration File: ☒ Include APL64 xml-format Configuration File

APLNow32 adf-format Configuration File: ☒ Include APLNow32 adf-format Configuration File

APLNow32 ini-format Configuration File: ☒ Include APLNow32 ini-format Configuration File

Additional Files Required for the Application

Source Path	Base Target Path	Target Path Suffix	Overwrite
Add One Required File to Runtime Executable Add Multiple Required Files to Runtime Executable			

ASSEMBLY META-DATA

Properties.Details: File Description:

Properties.Details: Product Name:

Properties.Details: Copyright: *

Properties.Details: File Version:

Properties.Details: Version: ☒ Same as File Version

Assembly.Info: Company Name:

Assembly.Info: Application Description: ☐ Same as File Description

Assembly.Info: Version: ☒ Same as File Version

Assembly.Info: Neutral Language:

Assembly.Info: Description: ☒ Same as File Description

Application Icon File:

* Required entries

Materialize additional file to the path where the WRE exe is installed, rather than the path where the WRE dll is running

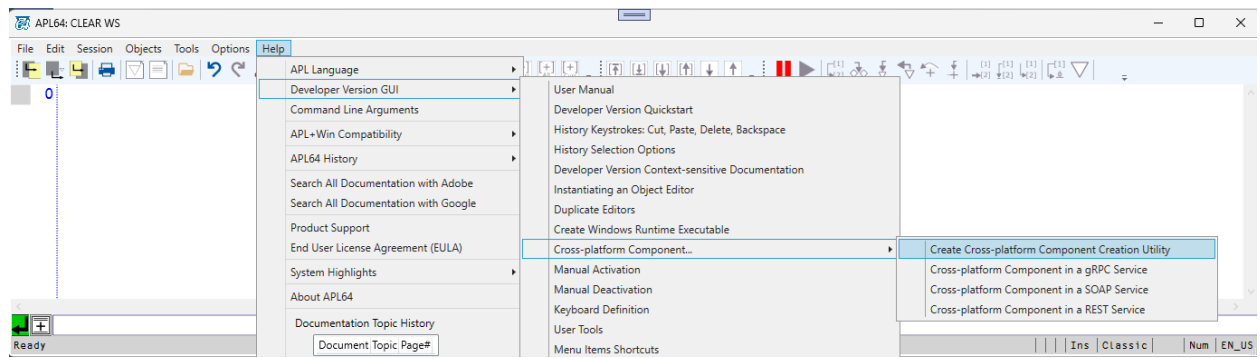
Materialize the APLNow32 ini and adf files, if included in the WRE, to the path where the WRE dll is running

The 'Add Folder of Required Files' button to add files in a folder and all sub-folders in the Additional Files Required for the Application area

The 'Remove All Required Files' button to remove all files listed in the Additional Files Required for the Application area

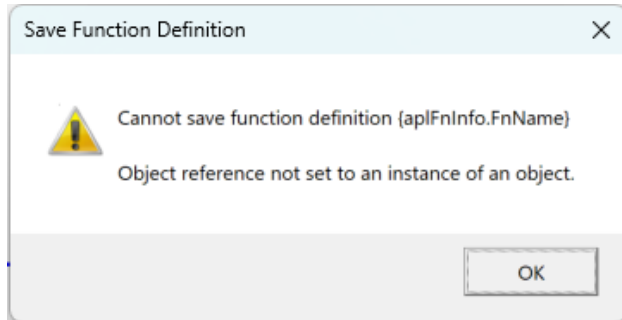
☐ CPC documentation consolidated

The menu item **Help | Developer Version GUI | Cross-Platform Component** contains all ☐ CPC programmer documentation. Examples are provided for using an APL64 cross-platform component in a gRPC Service, SOAP Service and REST Service.



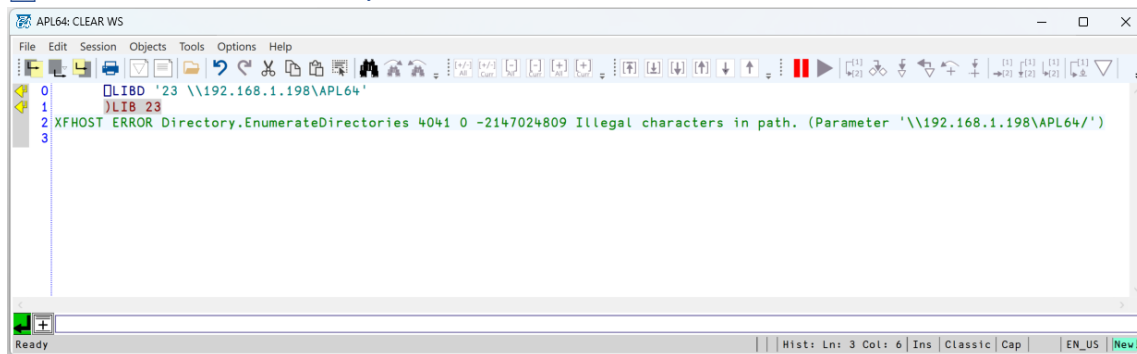
Bug Fixes

Function Editor: Wrong error message: Cannot save function definition {aplFnInfo.FnName}

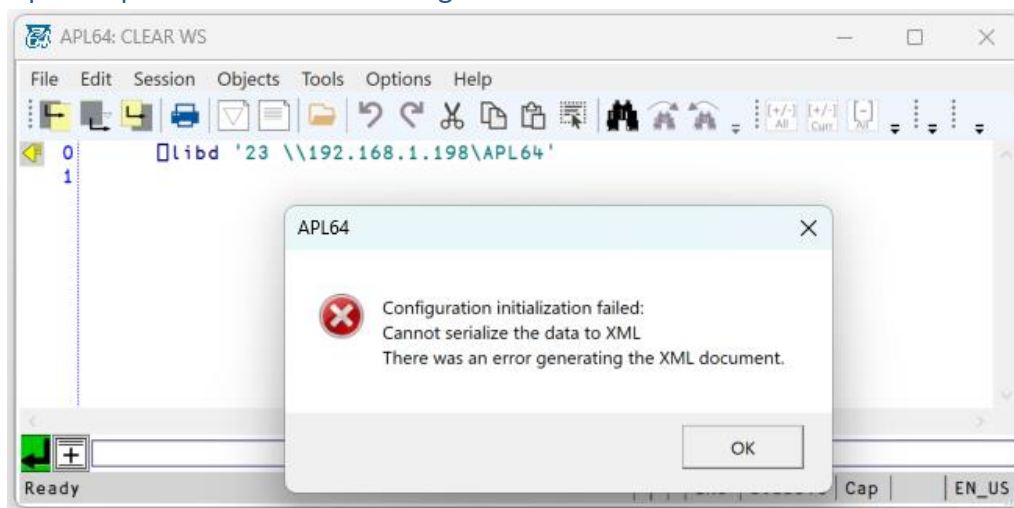


Outlining glyphs in the margins sometimes didn't appear in a function editor

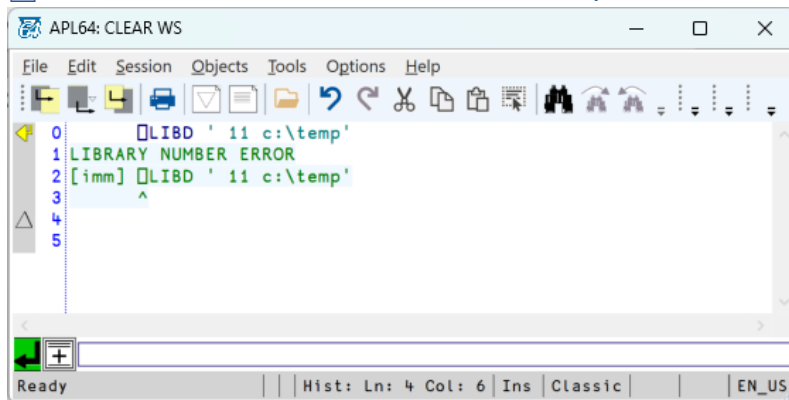
☐ LIBD did not create library definition for network sources



Options | Libraries... menu: Configuration initialization failed: Cannot serialize to XML



☐ LIBD LIBRARY NUMBER ERROR when library definition was not left justified



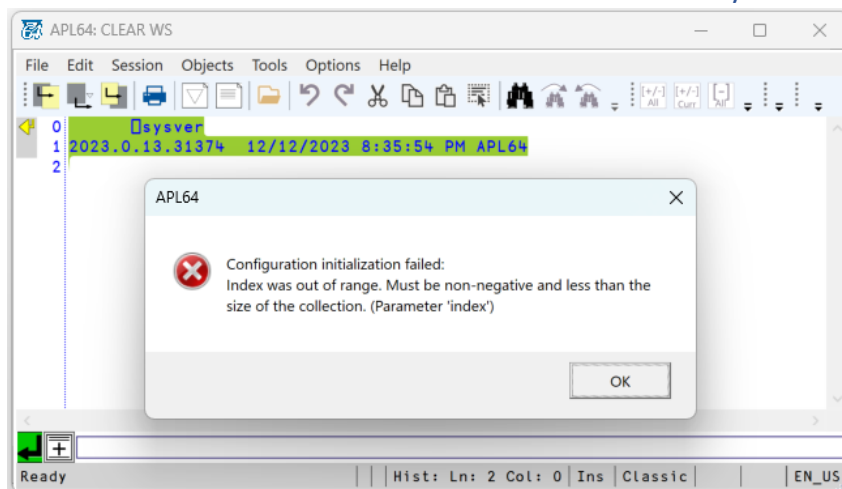
Case was retained for ☐libs and)libs for mixed-case library definition

When a mixed-case library definition was created using the Libraries Definition dialog, the mixed-case was retained. The setting of the ☐pathcase system variable dictates the display of the result of library numbers. The default setting for ☐pathcase is 0 to be compatible with APL+Win, so that library definitions are returned in upper-case.

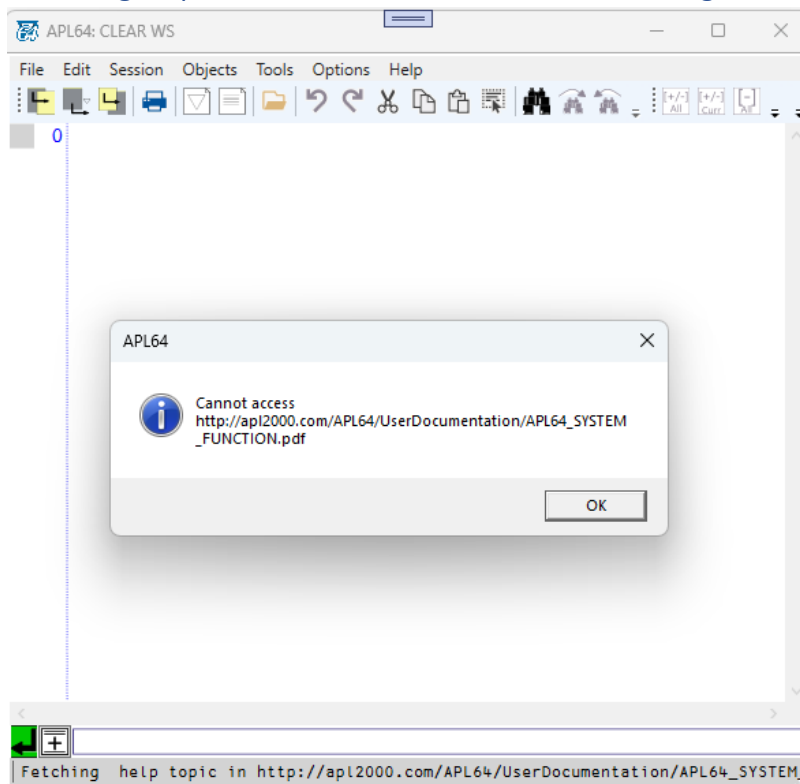
Extra space between library number and workspace name: WS NOT FOUND

When a library definition was created with extra space between the library number and workspace name, system commands such)LOAD,)COPY and)SAVE threw a WS NOT FOUND exception.

Ctrl+A then Ctrl+X in non-editable Classic Session History return an error



Accessing help file with no Internet connection: Configuration initialization failure exception



WRE Publish output log file contained messages referencing SpreadsheetGear

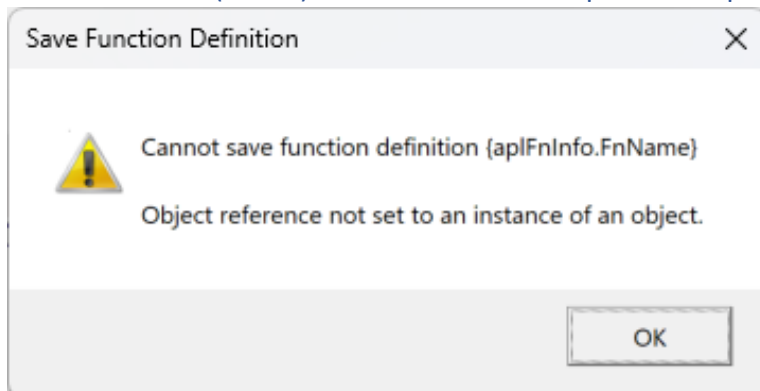
WRE failed to load APLNow.X64.dll in APL64 runtime system

This prevented primitive functions like indexing in APL statements from executing.

Empty array assigning caused INDEX ERROR

E.g., $Q \leftarrow 0 \ 0p0 \ \diamond \ Q[;1] \leftarrow \emptyset$

Save a function (Ctrl+S) with auto indented spaces exception



Function editor exception with :IF and :ANDIF or :ORIF control structures

This occurred when an :IF statement with :ANDIF or :ORIF used in an incomplete control statement such as :A, :AN, :ANDI, :O, :ORI leading to unhandled exception being thrown.

0 ☐ inbuf 'Default Value' ♦ X←☐ deadlocked APL64

Starting the Find in Functions in Workspace utility closed the APL64 instance

The APLGrid with xGripOptions=256 showed the dropdown list turn to black

This occurred when the vertical scroll bar in the list was scrolled and when APL64 was started with a manifest file.

Stepping in the debugger a line at a time (F10) didn't show the current line

This occurred when the line was below the bottom edge of the Debug pane.

☐ EDSS description incorrectly specified in the APL64 system functions documentation

The current)output state wasn't reset to ON after the)clear command

The current)output state wasn't saved in the workspace

Fetch Object operation in a function editor was not successful for a large numeric matrix

Debugger Pause toolbar did not suspend a function and activate the debugger

☐ wi HELPSTRINGS.txt documentation was not included in APL64 production release