

4D v16 - Upgrade

Welcome to 4D v16. This version is part of the continuous delivery (R-release) program.

This document describes new features and implementations added since 4D v15 R5. For more information about features introduced during the v15 R-release program, you can download the corresponding R-release Upgrade manuals (PDF):

- [4D v15 R2 - Upgrade](#)
- [4D v15 R3 - Upgrade](#)
- [4D v15 R4 - Upgrade](#)
- [4D v15 R5 - Upgrade](#)

New cache management

The database cache manager has been entirely rewritten in 4D v16, in order, more specifically, to take full advantage of 64-bit environments. Automatically available and optimized, it can nevertheless be configured or dynamically analyzed using the commands of the new **Cache Management** theme.

This theme includes, in particular, the new **Get cache size**, **Cache info** and **SET CACHE SIZE** commands.

User settings linked to a data file

It is now possible to define specific user settings linked to the current data file. This way you can deploy and update several copies of the same application with several data files, each containing different settings.

To manage this feature, you can use the new **Get 4D file** command; in addition, the **Get 4D folder** command now returns the data file of the database.

-> To find out more, see: [User settings](#)

New Code editor options

New options in the Preferences make it possible to customize the code editor: **Highlight the logical blocks**, **Always show block lines**, **Hide collapse/expand icons**, as well as **Highlighted text**.

-> To find out more, see: [Methods Page](#).

Preemptive Web processes

In 4D v16, the built-in Web Server of 4D 64-bit for Windows and OS X allows you to take full advantage of multi-core computers by using preemptive Web processes in your compiled applications. All Web Server commands are now thread-safe. You can configure your Web-related code, including 4D HTML tags and Web database methods, to run simultaneously on as many cores as possible.

-> To find out more, see: [Using preemptive Web processes](#).

New thread-safe commands

In 4D v16, several sets of commands are now thread safe, meaning they can be used in preemptive processes in compiled mode:

- All commands in the **Web Server** theme (see above)

- All commands in the **XML DOM** and **XML SAX** themes
- All commands in the **HTTP Client** theme
- Most of the 4D Write Pro commands, as well as the **FONT LIST** and **FONT STYLE LIST** commands.

4D Write Pro

The development of 4D Write Pro continues in version 16 and several major new features are now available:

- Default filtering of expressions contained in a 4D Write Pro document using 4D's standard filtering feature (**Filter expressions contained in a 4D Write Pro document**).
- Definition of view properties for 4D Write Pro areas (**Configuring View properties**).
- Headers and footers for pages and sections (**Handling headers, footers, and sections**). Support of pagination properties of former 4D Write documents (see **Importing 4D Write documents**).
- Automatic expressions such as `$wp_title` or `$wp_pageNumber` (**Inserting document and page expressions**)
- Support of **bookmarks** (named references to ranges) allowing you to build dynamic document templates; new **WP CREATE BOOKMARK**, **WP Get bookmark range**, and **WP DELETE BOOKMARK** commands
- New commands for inserting and creating elements and documents: **WP INSERT DOCUMENT**, **WP New** (new document from a range), **WP INSERT PICTURE**,

New commands for attributes of Object fields

The **DISTINCT ATTRIBUTE VALUES** and **DISTINCT ATTRIBUTE PATHS** commands generate arrays of distinct values based on attributes of Object fields in the 4D database.

The **QUERY SELECTION BY ATTRIBUTE** command performs a search limited to the records of the current selection.

Handling of On Mouse Up event for pictures

Thanks to the new **On Mouse Up Form event**, 4D v16 provides more accurate management of user clicks in pictures. This event is accompanied by the new **Is waiting mouse up** command, which allows you to ensure the consistency of the internal state for a picture object in this context.

List boxes

Two new features concern list boxes in 4D v16:

- **Column Auto-Resizing**: a new list box property automatically resizes all the list box columns when the list box width increases or decreases; (in previous versions, only the rightmost column of the list box could be resized).
- **Variable row height (4D View Pro option)**: you can define different heights for each list box row. This feature is based on the following elements:
 - a new **Row Height Array** property
 - the new **LISTBOX Get row height** and **LISTBOX SET ROW HEIGHT** commands.

GET PICTURE FORMATS

The new **GET PICTURE FORMATS** command returns all the codecs contained in the same picture. It is particularly useful for detecting obsolete picture formats and filtering formats you want to keep so as to reduce the size of the data file.

Print management

The new **BLOB to print settings** and **Print settings to BLOB** commands allow you to save and reuse all of a

user's current print settings, including "private" printer driver settings. These commands extend and replace the functionality of the (obsolete) 4D Pack **_o_AP BLOB to print settings** and **_o_AP Print settings to BLOB** commands.