

New Features in Oracle Visual Builder

Here's an overview of new features and enhancements added recently to improve your Oracle Visual Builder experience.

Topics:

- [Release 24.10 - December 2024](#)
- [Release 24.10 - August 2024](#)
- [Release 24.04 - February 2024](#)
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As soon as new and changed features become available, Oracle Visual Builder instances are upgraded in the data centers where Oracle Cloud services are hosted. You don't need to request an upgrade to be able to use the new features—they come to you automatically.

Note:

Classic applications created in earlier versions of Visual Builder use a structure that isn't compatible with the visual application structure now used in Visual Builder. No further feature development work is planned for Classic applications, and only critical bug fixes will be addressed. Oracle recommends that you update your Classic applications to use the visual applications approach, which provides a much more robust functionality for creating sophisticated apps.

For the moment, you can use your Visual Builder instance to manage Classic applications, but this option will be disabled by default in new instances starting soon. You can use your existing instance to export Classic applications and then import them as visual applications to migrate the business objects, but be aware that there are no migration capabilities for the web or mobile UIs. See [About Classic Applications](#).

Release 24.10 - December 2024

Change	Description
Create instance as private endpoint	<p>When provisioning a new VB instance, you can now specify that Visual Builder use a private endpoint inside a Virtual Cloud Network (VCN) in your tenancy. This allows you to keep all traffic to and from your instance off the public internet.</p> <p>If you want to allow access to a private endpoint from outside the VCN, you can use a load balancer in front of the endpoint. This way you can allow public access to the instance, while the instance is within a private VCN where it can access your ATP database.</p> <p>For details, see Create an Instance as a Private Endpoint</p>

Release 24.10 - August 2024

Change	Description
Dark theme for web apps	<p>When you create a <i>new</i> web app using the default template, you can now customize the app's theme to show components against a dark background, instead of the default light background with dark text. You can even let your users choose between a Light and Dark theme. CSS variables to override the default Redwood look and feel are still supported—only now you make those overrides in the CSS files specific to the Light and Dark theme. See Customize a Web App's Appearance.</p>
Opt-in for Core Pack components	<p>Core Pack components, available under the Early Access category in the Components palette since 24.04, now require an opt-in if you want to use them in your application's pages. If you use these Core Pack components in your app, take note that Core Pack does not support theming at this time. The only way to theme your app is to roll back Core Pack usages in your app to Legacy components and re-implement your application. If you don't ever plan to theme your app, you can choose to enable Core Pack components in the Components palette for use in your app's pages. See Opt In to JET Core Pack Components.</p>
Business rules	<p>Business rules, which control the logic that determines what's displayed on the page at runtime, are now available for all extensions as well as visual applications. See Use Business Rules With Your Rule Sets.</p>

Change	Description
Enhanced variable and type creation	<p>We've optimized the process of creating multiple variables and types, so each variable or type is generated with a default name. You'd then use the Properties pane to update the name and other properties as needed. See Create Variables and Create Types.</p> <p>With this update, the ability to create a custom type that defines a list of enumeration values is deprecated. See Deprecated Features.</p>

Change	Description
Enhancements for JavaScript action chains	<ul style="list-style-type: none"> <li data-bbox="857 289 1458 464">• Actions within custom code You can now drop an action between single line and block statements in custom code, functionality that can improve productivity. Additionally, you can also take advantage of code completion in a Code action's Properties pane. See Add a Code Action. <li data-bbox="857 474 1458 831">• Shorthand syntax for variables, constants, functions in current scope When you create a new JavaScript action chain or add actions to an existing chain, the underlying code now uses shorthand syntax, by default, to retrieve the value of variables, constants, and functions defined in the current scope. So for a page, where previously the syntax was <code>\$page.variables.myvar</code> or <code>\$page.functions.myfunc</code>, you'll now see <code>\$variables.myvar</code> or <code>\$functions.myfunc</code> instead in your action chain. <li data-bbox="857 842 1458 1010">• Duplicate option in JS action chains You can now duplicate an action, or a code block within an If, Switch, or Run in Parallel action. See Create Action Chains in Design Mode as well as Add an If Action, Add a Switch Action, and Add a Run In Parallel Action.



Note:

The option to toggle between JSON and JavaScript action chains in the Action Chains tab is no longer available. This change does not impact existing JSON action chains, which you can continue to edit—but all new action chains default to JavaScript. Further, you can no longer create new tests for JSON action chains, though existing

Change	Description
New <code>dirtyDataStatus</code> property in <code>vbBeforeExit</code> payload	<p>If you track changes in a variable's state to detect unsaved changes, you can now use the <code>vbBeforeExit</code> event listener's <code>dirtyDataStatus</code> payload (instead of the Get Dirty Data Status action) to check whether navigating away from a page will result in the tracked variable losing its data. See Add a Get Dirty Data Status Action.</p>
Dependent fragment property for display	<p>When curating fragment properties for display in the Properties pane, you can now use an item's Dependent On field in the Design Time tab to specify other items that this item depends on for its data. This way, when the fragment is used on a page or container, the dependent item won't show in the Properties pane until the other items have their value. See Section Fragment Properties for Display in the Properties Pane.</p>
Upgrade support for imported resources	<p>Resources that are using an older set of runtime dependencies when your app is imported can now be made compatible with the app's current runtime version. See Upgrade Imported Resources.</p>
Option to select existing field for M:1 and 1:1 business object relationships	<p>A new and improved editor is now available when you create many-to-one and one-to-one relationships between business objects. Besides other improvements, the editor gives you the option of creating a new field as the referenced key (default), or selecting an existing field of the correct type. See Create a Many-To-One or One-To-One Relationship.</p> <p>Many-to-many relationships continue to use the existing editor, now without the ability to change cardinality. A new + Many to Many Relationship option is also added to a business object diagram's context menu.</p>

tests will continue to run.

Change	Description
Usability improvements	<ul style="list-style-type: none"> Application Name field renamed The Application ID specified when you create or duplicate an application is now Application Name. Also, what used to be Application Name is now Application Display Name. With this change, the app's display name, name, and ID are displayed on the Settings editor, so you can pick the correct value when building REST URLs for cURL commands. See Create a New Visual Application, Create a Copy of an Application, and Manage Visual Application Settings. New Select Variable icon in the Properties pane The Select Variable icon in the Properties pane has been changed to better represent the variable picker. You'd now click  (instead of  previously) to select a variable. Listener shortcut on the Events editor You can now use a shortcut to create a listener when you're working with custom events in the Events editor, instead of switching to the Events Listener editor. Simply select the new Create Event Listener option in an event's right-click menu to create a new event listener in the same scope as the event. See Create Event Listeners for Events.

24.10 Runtime Version

This release of Visual Builder uses Oracle JET 16.1.x libraries and components. We recommend that you upgrade your Visual Builder applications to this latest JET version, as well as to the 24.10 Visual Builder Runtime, to take advantage of the full spectrum of 24.10 features. JET 16.1.x is primarily a bug fix release, but it does include some visual and behavior changes. To see a list of what's new in JET 16.1.x, go to the [JET Release Notes](#) and select **v16.1.0**.

You can upgrade to the latest JET and Visual Builder Runtime versions from your visual application's Settings editor. See [Manage Runtime Dependencies for Visual Applications](#).

Release 24.04 - February 2024

Change	Description
Dark theme	<p>You can now personalize the Designer's theme to switch from the default light theme to a dark theme more suited for low-light conditions. You can also sync your environment's color palette with your OS settings. See Tour the Designer.</p> <p>With support for a dark theme, favicons can now be set independently for light and dark themes for each of your applications. You can set the favicon to any image in the image gallery by simply changing the favicon in the application's Settings editor. See Manage App Settings.</p>
Highlighting of default flow/page in the navigator	<p>The default page and flow within your app are now badged as <code>default</code> in the navigator for easier identification. This way, you can quickly identify the entry points for your app without having to check artifact configuration. See How are Applications Structured?</p>
Page header fragment	<p>New pages in web applications now include a <code>page-header</code> fragment to hold page-specific boilerplate content that appears above the page's visual stripe. While you won't work with the fragment directly, you can customize the fragment to create a custom page-level header. See Customize Page Headers.</p>

 **Note:**

Pages created with previous versions will not be affected. These pages will maintain their original structure even after your app is upgraded to 24.04.

Change	Description
Fragments	<ul style="list-style-type: none"> <li data-bbox="857 289 1458 552"> <p>• Fragments as sections for dynamic containers</p> <p>It's now possible to add fragments as sections in a dynamic container. By default, all fragments tagged as <code>pageContent</code> become available for selection when you add a section to a dynamic container. You also have the option of indicating a particular fragment as preferred content for all sections in the container. See Add Fragments as Sections in a Dynamic Container.</p> <li data-bbox="857 562 1458 741"> <p>• InstanceFactory types for fragments</p> <p>Types from code, known as <i>InstanceFactory</i> types, can now be defined in fragments, making these types accessible to fragments. As with all fragment artifacts, these types are local to the fragment. See Create a Type From Code.</p> <li data-bbox="857 751 1458 930"> <p>• New properties for fragment slots</p> <p>The Fragment Slot component now provides several new properties to help you configure a named slot, including a Preferred Content option that indicates the type of content the slot can contain. See Add Slots to a Fragment.</p> <li data-bbox="857 940 1458 1077"> <p>• Drag and drop for fragment slots</p> <p>Fragment consumers can now drag and drop their component of choice onto a fragment slot in the fragment's Properties pane, in addition to the Insert Component option. See Add Slots to a Fragment.</p> <li data-bbox="857 1087 1458 1780"> <p>• Improvements on customizing fragment variable display in the Properties pane</p> <ul style="list-style-type: none"> <li data-bbox="906 1150 1458 1371"> <p>– If your fragment variable uses an array of primitives (for example, <code>string[]</code>), you can now edit the fragment's JSON to display a drop-down menu showing all values for each item in the array. See Subtypes and valueOptions for arrays in Customize How a Fragment Variable is Displayed in the Properties Pane.</p> <li data-bbox="906 1381 1458 1581"> <p>– When an object-type input parameter in a fragment is customized to display an endpoint picker, fragment users can use the Configure Endpoint quick start to select a suitable endpoint and choose its URI parameters. See Customize How a Fragment Variable is Displayed in the Properties Pane.</p> <li data-bbox="906 1591 1458 1780"> <p>– When sectioning fragment properties, you can now use a Label field to provide a user-friendly name for the fragment variable. This is particularly useful for dynamic components with data that might take a while to display in the Page Designer. See Section Fragment Properties for Display in the Properties Pane.</p>

Change	Description
Buffering Data Provider type	Oracle JET's Buffering Data Provider, which temporarily stores data changes in a buffer until they are ready to be committed to the data source, is now available as a type out of the box in Visual Builder. You can create variables based on the Buffering Data Provider type and bind them to tables, list views, or any component that accepts a data provider. See Create Variables to Temporarily Store Data in a Buffer .
Audit improvements	<p>We've made several improvements, including performance updates, to enhance the auditing experience, key among them being:</p> <ul style="list-style-type: none"> • Navigator badge to indicate audit error Audit errors are now badged in the Navigator to indicate that action must be taken to resolve the issue. The badge persists until the error is fixed or until the session ends. • New Copy to Clipboard option A new Copy to Clipboard option in the right-click menu allows you to copy one or all audit issues to your clipboard for further processing. See Audit Application Code.
Build-related logs	You can now troubleshoot build-related issues that prevent your app from being staged or published. Build logs are available in a new Logs tab at the bottom of your browser. See Troubleshoot Build Issues .
Application resource optimization	You can now optimize an application's resources when your visual application is ready to be shared in order to reduce load times and network traffic. Optimization minifies application images and stylesheets, and creates RequireJS bundles in an embedded build server. See Optimize Your Application .
Prerendered pages for improved SEO	In an effort to improve search engine optimization (SEO), Visual Builder now prerenders and caches your application's pages, returning a fully rendered page to web crawlers for indexing. To further improve response times, use the <code>vb-prerender-cache-warm</code> Grunt task to warm the cache for URLs listed in your application's sitemap, so web crawlers always get the fastest possible response when requesting those URLs. See Optimize Your App for Search Engines .

Change	Description
Page Designer improvements	<ul style="list-style-type: none"> <li data-bbox="857 289 1455 642"> <p>• Core Pack in Components palette</p> <p>The next generation of Oracle JET components, known as Core Pack components, are now available in the Components palette as part of the Early Access category. These components, written entirely using the VComponent API and the JET Virtual DOM architecture, are available as a completely new set of components, so you can use Core Pack and legacy components side by side in your application. Core Pack components provide improved rendering performance over legacy components. See Add Components to Pages.</p> <li data-bbox="857 646 1455 852"> <p>• Page input parameters from parent flows</p> <p>When input parameters for a page are defined beyond its current scope (say, at the app or flow level), those parameters are now listed in the Page Input Parameters dialog, allowing you to readily pass the input parameter from parent flows and pages. See Enable Variables as Input Parameters.</p> <li data-bbox="857 856 1455 1062"> <p>• Live/Design toggle change</p> <p>To switch between Live and Design modes using the Ctrl key (Cmd on Mac), the cursor must now be on the canvas. This way, the mode won't switch when the canvas is not in focus. Releasing the key to switch the toggle back works anywhere. See Use the Page Designer.</p>
Option to reopen closed tabs	<p>To reopen recently closed tabs, you can now simply right-click an empty space on the tab bar in the Page Designer and select Reopen Closed Tab—until you get to the tab you want to reopen. See Tour the Designer.</p>
Automatic endpoint selection in collection quick starts	<p>When using a business object or a service with expected endpoints, Visual Builder now automatically selects the correct endpoint in the Add Create Page, Add Edit Page, and Add Detail Page quick starts. You only need to select the fields you want to display in your pages. See Use the Create Page Quick Start, Use the Add Edit Page Quick Start, and Use the Add Detail Page Quick Start.</p>

Change	Description
Event enhancements	<ul style="list-style-type: none"> <li data-bbox="857 289 1458 611"> <p data-bbox="906 289 1357 342">• Event editor updates to improve developer productivity</p> <p data-bbox="906 352 1458 611">We've reworked how new action chains are generated when you create a listener for an event. Previously, you would use several clicks to create a new action chain at the desired scope with a particular name in the Create Event Listener wizard. Now you simply click the Create {scope} Action Chain option to generate an action chain with a name in the format {event/variant}ChangeListener. See Create Event Listeners for Events.</p> <li data-bbox="857 621 1458 968"> <p data-bbox="857 621 1300 642">• New behavior type for custom events</p> <p data-bbox="906 653 1458 968">The <code>transform</code> behavior type for custom events is deprecated and replaced by the new <code>transformPayload</code> behavior type for <i>new</i> event listeners. The change does not impact existing apps with events configured to use the <code>transform</code> type, but the new <code>transformPayload</code> type addresses issues with invoking event listeners in the correct order. You are, therefore, encouraged to switch to the new behavior type for your existing apps. See Choose How Custom Events Call Event Listeners.</p>

Change	Description
JavaScript action chain enhancements	<ul style="list-style-type: none"> <li data-bbox="857 289 1455 342"> <p>• Actions tab renamed</p> <p>The Actions tab is now the Action Chains tab.</p> <li data-bbox="857 359 1455 646"> <p>• New options for local functions</p> <p>You can now <i>convert</i> a local function to an action chain so it can be used by other action chains. Simply right-click the local function and select the new Convert Function to Chain option. It's also possible to <i>create</i> a local function from an action on the canvas. Just drag an action on the canvas onto the Create Function button, or onto the green line that appears before or after a local function. See Design Editor.</p> <li data-bbox="857 657 1455 919"> <p>• Summary button to simplify action chain view</p> <p>You can now visually simplify your view of an action chain by hovering over the canvas's upper-left corner and clicking the Summary button. The Summary button hides the input parameter details of each action (except for the Assign Variable and Reset Variables actions). Click the Full button to switch back to the complete view. See Design Editor.</p> <li data-bbox="857 930 1455 1129"> <p>• Simplified display for action parameters</p> <p>We've simplified and enhanced how parameters display in different actions. Parameters displayed in actions such as Open URL, Call REST, and Fire Data Provider Event are now grouped. Also, the Store Result In variable has been added to the header to make it more readable.</p> <li data-bbox="857 1140 1455 1360"> <p>• Changes to the Assign Variable action</p> <ul style="list-style-type: none"> <li data-bbox="906 1178 1455 1255">– The Assign Variable action can now be used to create a local variable, by adding the action and using the Properties pane to define it. <li data-bbox="906 1266 1455 1318">– Consecutive Assign Variable actions are now consolidated into a single action. <p>See Add an Assign Variable Action.</p> <li data-bbox="857 1371 1455 1488"> <p>• Support to drag and drop an action into an else branch</p> <p>You can now drag and drop an action into an <code>else</code> branch on the canvas.</p>

Change	Description
Business objects	<ul style="list-style-type: none"> UI changes for business objects based on your own schema When working with business objects that use your own schema, you'll notice some UI changes, primarily when adding or editing a business object's fields. See Create a Business Object Based on a DB Table or View and Add Fields to a Business Object Based on a DB Table or View. Improved error handling for business object diagrams When business objects and their relationships don't display on the Diagram canvas because of syntax errors, the editor now displays an error message and allows you to edit the JSON source file (<code>diagram.json</code>) to fix the error.
Support for OCI Process Automation	<p>Oracle Cloud Infrastructure Process Automation, a service that quickly automates business approval workflows, can now be integrated in Visual Builder. To leverage this functionality in your application, create an OCI Process Automation backend, then create service connections for the REST APIs you want to use. See Connect to Oracle Process Automation APIs.</p> <p>With OCI Process Automation now supported, the following Process-related features are deprecated:</p> <ul style="list-style-type: none"> Register deployed processes Use of Process actions in action chains Support for Process code snippets Process-related quick starts <p>See Deprecated Features.</p>

24.04 Runtime Version

This release of Visual Builder uses Oracle JET 15.1.x libraries and components. We recommend that you upgrade your Visual Builder applications to this latest JET version, as well as to the 24.04 Visual Builder Runtime, to take advantage of the full spectrum of 24.04 features. To see a list of what's new in JET 15.1.x, go to the [JET Release Notes](#) and select **v15.1.0**.

You can upgrade to the latest JET and Visual Builder Runtime versions from your visual application's Settings editor. See [Manage Runtime Dependencies for Visual Applications](#).

Release 23.10 - September 2023

Change	Description
Changed upgrade policy	<p>Our upgrade policy has been changed to support applications built on the current runtime version as well as the <i>three</i> previous versions. Previously, it was the current runtime version and the <i>two</i> previous versions. See Upgrade Policy.</p>
JavaScript action chains	<p>You can now create action chains in JavaScript. JS action chains allow you to debug them using the browser's developer tools; they are also easier to manage through Git actions. A Design view that reflects code structure helps you build functionality by dragging and dropping actions; you can also choose to work entirely in Code view.</p> <p>With this update, all <i>new</i> action chains (including those created by Quick Starts) will default to JavaScript—though you can still create JSON action chains. Existing JSON action chains will continue to work as before.</p> <p>As a part of this update, you'll notice a few usability improvements:</p> <ul style="list-style-type: none"> • List view for Actions palette <p>The Actions palette in the Action Chains editor now has a new List view, in addition to the default Grid view, allowing you to view available actions alphabetically in each category. Customizing the view saves your palette preferences separately for each action chain.</p> • "Surround With" options <p>When working with an action in Diagram mode, you can now use the Surround With options in an action's right-click menu to wrap the action in an If or Try-Catch action.</p> • Code insights <p>When working with an action in Code mode, you can now use Code Insight to quickly reference scoped artifacts and local variables. Simply enter \$ to bring up the insights pop-up menu, then make your auto-fill selection.</p> <p>See Work with JavaScript Action Chains.</p>

Change	Description
Mobile apps deprecated	<p>Mobile apps have been deprecated in favor of Progressive Web Apps (PWAs)—although mobile functionality won't be entirely removed from the product until July 2024. Starting with 23.10, you can no longer create a new mobile app, but you can import an existing mobile app and deploy it as a PWA for use on mobile devices. See Run Mobile Applications as PWAs.</p> <p>Functionality relating to hybrid mobile applications (deprecated since April 2021) has also been removed from the product. This means that the use of build configurations to build native <code>.ipa</code> and <code>.apk</code> files for distribution to iOS and Android devices—as well as the Cordova custom plug-in option—are no longer available. You can no longer create new hybrid mobile apps or new build profiles for existing apps; build configurations for existing apps will be ignored. For apps that target mobile devices, enabling PWA support is the recommended approach for distribution.</p> <p>You can continue to use your existing mobile apps until July 2024 when mobile apps (including PWA-enabled ones) reach End of Life (EOL). To be able to use your mobile PWAs beyond July 2024, we strongly urge you to transition your mobile app as a web app and deploy it as a PWA.</p>
Improved diagnostics for IDCS client apps	<p>We've made it easier for you to identify and troubleshoot issues with your visual application's client apps created in IDCS. A new IDCS Details tab, available under Application Profiles in the app-level Settings editor, provides details to help you inspect IDCS details and identify any configuration issues. See How Do I View Details of Client App in IDCS?</p>
Variable enhancements	<ul style="list-style-type: none"> • Variable tracking to detect unsaved changes You can now track a variable's state to detect unsaved changes in your app. Tracking a variable marks it as "dirty" any time its value changes. You can then query for dirty variables using a new JavaScript-based <code>Get Dirty Data Status</code> action. If you don't want a change to be considered dirty, you can reset variable state using the <code>Reset Dirty Data Status</code> action (also based on JavaScript). See Track Variables to Detect Unsaved Changes. • Filter for input parameters A new Show Input Parameters only option on the Variables editor now allows you to filter variables used as input parameters. See Enable Variables as Input Parameters.
Enhanced payload for <code>vbBeforeExit</code> event	<p>The <code>vbBeforeExit</code> event, which is triggered before navigating away from a page, now provides a new payload format when navigation is triggered by the browser's back or forward button. See Lifecycle (Page and Flow) Events.</p>

Change	Description
Fragment enhancements	<ul style="list-style-type: none"> <li data-bbox="857 289 1458 583"> <p>• Slots in fragments</p> <p>A new Fragment Slot component, available in the Components palette, now allows you to add slots to a fragment where users can drop in their own content. A fragment with slots, when used on a page, reveals its slots on the canvas, the page structure, and as part of the fragment's properties. Fragment slots are similar to component slots and users work with them in much the same way. See Add Slots to a Fragment.</p> <li data-bbox="857 590 1458 821"> <p>• Autowiring of fragment variables</p> <p>To simplify the process of creating pages with fragments, we've added a new property for fragment variables enabled as input parameters to be automatically created on the page where the fragment is used and wired back to the fragment variable's value. See Automatically Create and Wire a Fragment Variable on Its Container.</p> <li data-bbox="857 827 1458 1121"> <p>• Design Time support to display an enhanced UI for fragment input parameters</p> <p>A new Design Time tab in a fragment variable or constant's Properties pane now allows you to customize the UI component shown in the Properties pane when the fragment is selected on a page or container. Previously, you had to do this by editing the JSON metadata. See Customize How a Fragment Variable is Displayed in the Properties Pane.</p> <li data-bbox="857 1127 1458 1568"> <p>• Support to display fragment input parameters in sections</p> <p>You can now group a fragment's input parameters and dynamic components by sections using a new Design Time editor that appears in the fragment's toolbar. Use this option to display a fragment's most important properties in the Properties pane when the fragment is selected on a page or container. See Section Fragment Properties for Display in the Properties Pane.</p> <p>If the fragment is used as a page template to create a page, the sectioned view also shows on the page's Properties pane and the Structure view, with the fragment considered the root element instead of the page. See Create Pages From Fragments.</p>

Change	Description
Service/backend enhancements	<ul style="list-style-type: none"> Backends mandatory for new service connections If you're looking to create a <i>new</i> service connection by providing a specification document or an endpoint URL, you now need an existing backend to be able to create the service connection. If a backend doesn't exist, you'll be prompted to create one as part of the Create Service Connection workflow. With this update, all new service connections will require a backend. Making backends mandatory simplifies the task of managing server connection attributes, especially credentials, across environments. Service connections created previously without a backend will continue to work and their configuration settings can be changed as well. See Create a Service Connection from a Service Specification and Create a Service Connection from an Endpoint. Default service name change New service connections no longer include a default name. You can now specify your own service name for easier identification. See Create a Service Connection from the Catalog, Create a Service Connection from a Service Specification, and Create a Service Connection from an Endpoint.
Support for pinning columns in dynamic tables	You can now "freeze" table columns in dynamic tables, so that a column will remain visible when horizontally scrolling within a table. See Configure How Columns Render in a Dynamic Table's Layout .
Other enhancements	<p>We've made several updates (including performance enhancements) to improve your design experience. Here are the key updates:</p> <ul style="list-style-type: none"> Multiple undo and redo options in the Designer When working in the Designer, you can now undo and redo multiple actions at one shot; previously, you could undo and redo only your most recent change. See Tour the Designer. Audit improvements As a part of performance improvements to enhance application auditing, a new Opened Artifacts setting only audits artifacts that are currently open. To audit the entire application, change this setting to All Artifacts. Further, results in the Audits pane now show in a tree view, instead of a column view. With this change, issues are grouped by artifact, helping you view <i>all</i> issues in a particular artifact. See Audit Application Code.

23.10 Runtime Version

This release of Visual Builder uses Oracle JET 14.1.x libraries and components. We recommend that you upgrade your Visual Builder applications to this latest JET version, as well as to the 23.10 Visual Builder Runtime, to take advantage of the full spectrum of 23.10 features. JET 14.1.x includes design updates for Timeline, Gantt, and Gauge components as well as a new Ghost chroming option for buttons. To see a list of what's new in JET 14.1.x, go to the [JET Release Notes](#) and select **v14.1.0**.

You can upgrade to the latest JET and Visual Builder Runtime versions from your visual application's Settings editor. See [Manage Runtime Dependencies for Visual Applications](#).

Release 23.04 - February 2023

Change	Description
Consumption and user metrics	Administrators can now use the Metrics pane in the Oracle Cloud Infrastructure (OCI) Console to view a Generation 2 instance's resource consumption, database usage, as well as the number of logged-in users. This information can help you observe trends, diagnose issues, and plan instance-scaling needs, all from a single location. See View Instance Metrics .
Accessible UI	The Visual Builder Designer, which provides a declarative user interface through pages, wizards, and other browser-based tools to create and modify web applications, is now fully accessible. The new accessibility features help developers with disabilities leverage the productivity of Visual Builder to create apps. See Accessibility Features and Tips for Oracle Visual Builder .

Change	Description
Fragment improvements	<ul style="list-style-type: none"> <li data-bbox="857 289 1458 758"> <p>• Create pages with a fragment's content</p> <p>You can now create pages prepopulated with a fragment's content when the fragment is tagged with the <code>page</code> metadata that surfaces it as page-level content. This way, you create pages easily with initial content, both from the Create Page dialog as well as the app-level Flow Diagram. See Create Pages From Fragments and Add a Page in the Flow Diagram.</p> <p>Because this option essentially uses a fragment as a page template, it's also possible to change the page's content at the click of a new Select Page Template button. This option allows you to remove everything from the page, including associated files, but keep the same page name. See Change Page Templates.</p> <li data-bbox="857 768 1458 1146"> <p>• Write back changes in a variable's value to a fragment's parent container</p> <p>When a fragment variable is marked as an input parameter for a page variable, a new Write Back to Container property, available on a fragment variable's Properties pane, allows you to automatically write back changes in the fragment variable's value to the page variable used as an input parameter. This option provides a convenient and powerful alternative to raising custom events that emit to the parent container. See Automatically Write Back a Fragment Variable's Value to Its Container Variable.</p> <li data-bbox="857 1157 1458 1388"> <p>• Customize a fragment variable's Properties pane</p> <p>You can now customize a fragment variable's Properties pane to suit the UI component that will be used to edit the variable in the Page Designer. Previously, the Properties pane always used text field components for editing the values of fragment variables. See Customize a Fragment Properties Pane.</p> <li data-bbox="857 1398 1458 1734"> <p>• Suggest a fragment for particular components</p> <p>A new Implements setting now allows you to suggest a fragment as preferred content for particular components. For example, if you choose <code>FoldoutPanelElement</code>, users working with a foldout layout will see this fragment suggested as content that can be added as a foldout section. See Manage Fragment Settings.</p> <p>With this update, the <code>listItem</code> and <code>foldoutPanel</code> options are no longer available for the Used For setting.</p> <li data-bbox="857 1745 1458 1829"> <p>• Create a fragment from the Components palette</p> <p>A small but nifty enhancement allows you to create a fragment directly from the Components Palette, by</p>

Change	Description
App lifecycle management	<p>using the  icon next to the Fragments category. See Create and Add a Fragment to a Page.</p> <p>We've made it simpler for you to delete several applications, including versions of the same application, all at once. Where previously this involved several steps, all you need to do now is select the applications/versions on the Home page, click a new Move to trash button, and confirm deletion. See Delete a Visual Application.</p> <p>Deleted applications are moved to a Soft Deleted status and can be restored within 30 days if they've not been permanently deleted. See Restore a Deleted Application.</p>
Smart delete	<p>When you delete items such as variables, types, event listeners, and action chains, Visual Builder now provides a "smart delete" functionality that detects if the item is currently used in your app, or if it has related but unused items elsewhere in the app.</p>
Offline support for PWA-enabled web apps	<p>When you use Grunt build tasks to deploy your applications, offline support for PWA-enabled web apps is now on par with that of mobile PWAs. The Grunt-based <code>vb-pwa</code> task, which runs within the <code>vb-package</code> task, pre-caches application resources such as pages, CSS, and JavaScript files, so they are all available when a user goes offline. See vb-pwa.</p>

Change	Description
Pages based on Redwood templates and patterns	<p>You can now create pages based on Redwood templates and patterns to leverage high-fidelity interactions and responsive performance for your app's pages out of the box. While these templates and patterns are useful in creating pages that provide a consistent user experience across your app, it's just as easy to customize them to suit your business requirements. See Create Pages From Page Template Patterns.</p> <p>It's also possible to change the page's content at the click of a new Select Page Template button. This option allows you to remove everything from the page, including associated files, but keep the same page name. See Change Page Templates.</p>

 **Note:**

To work with template patterns, the Redwood components associated with your application must be on 2301 or later. Template patterns are **not** available in version 2210 or earlier.

Change	Description
Business object enhancements	<ul style="list-style-type: none"> <li data-bbox="857 289 1458 499"> <p>• Data type changes for fields</p> <p>You can now change the data type for business object fields—functionality that allows you to use a non-numeric field as the object's primary key field. Previously, you could change data types only when creating business objects from a file. See Change a Field's Data Type.</p> <p>This functionality is also supported for business objects that use your own schema, where creating a field based on a DB column always sets the field's data type to the column's default type. See Change a Data Type of a Field Based on a DB Column.</p> <li data-bbox="857 653 1458 1003"> <p>• Custom audit fields</p> <p>It's now possible to use your own fields to audit your business object's history. While this functionality is available for native business objects, it's most useful for business objects that use your own schema when you have existing DB columns that you want to use for auditing. See Set a Field for Auditing.</p> <p>It's also useful for business objects created from a file, when your data file has audit information that you can use to track the object's history, instead of the default audit fields. See Set Audit Fields for an Imported Business Object.</p>
Service connection enhancements	<ul style="list-style-type: none"> <li data-bbox="857 1024 1458 1234"> <p>• New type viewer for service endpoints</p> <p>You can now use a new Type viewer to see the type structure for an Endpoint's request/response. This means that you no longer have to create a web app and use a query string or type from the Endpoints tab in the Page Designer to see the type structure. See Create a Service Connection from an Endpoint.</p> <li data-bbox="857 1234 1458 1413"> <p>• Audit warning for IP-based service URLs</p> <p>An IP address audit warning is shown for service connections that use IP-based addresses in URLs, as a reminder to use DNS-based addresses instead. See Create a Service Connection from an Endpoint.</p>

Change	Description
Other enhancements	<p>We've made several updates (including performance enhancements) to improve your design experience. Here are the key updates:</p> <ul style="list-style-type: none"> • View page initialization time <p>A new  icon in the Page Designer's canvas now displays a breakdown of how long different tasks (such as bootstrapping and loading a shell page) take to display the page. You can use this information to isolate runtime issues that may cause your app to load slowly.</p> • Improved tab bar <p>We've redesigned the tab bar to always show the active tab, even when the window is resized. When you have multiple tabs open, you can use the mouse or keyboard to scroll through them—though moving the focus away will bring the active tab back into focus. You can also use a new  icon to view a drop-down list of overflow tabs; from here, you can open a particular tab or close it.</p> • Components in Components palette categories expanded by default <p>The default view for the Components palette is now changed to always show components in every category. This view is controlled by a new Expanded By Default option in the Components palette's options menu.</p> • Advanced category in Components palette <p>For discoverability reasons, all JET components are now available in the Components palette, with those that don't have design-time properties showing under a new Advanced category. Components in the Advanced category typically require you to manually code different aspects of their functionality.</p> • Preferred category of components for use in slots <p>When you use Insert Component in the Structure view to drop a component directly into a slot, a list of recommended components show up under a Preferred category. These components are recommended based on the type of component that can be used in the slot.</p> • Options to insert a component in code editors <p>It's now possible to insert a component before, inside, or after an existing component from a code editor's right-click menu.</p>

Change	Description
How to abort HTTP calls	We've added documentation to help you cancel long-running HTTP calls using <code>AbortController</code> , a browser-based interface that lets you abort a web request. <code>AbortController</code> was an experimental feature previously, but is now supported by all browsers. See Abort Pending REST Calls .

23.04 Runtime Version

This release of Visual Builder uses Oracle JET 13.1.x libraries and components. We recommend that you upgrade your Visual Builder applications to this latest JET version, as well as to the 23.04 Visual Builder Runtime, to take advantage of the full spectrum of 23.04 features. JET 13.1.x is primarily a bug fix release, so you may want to refer to the JET 13.0.0 release notes for the major updates that are still relevant to JET 13.1.x. Among JET 13.0.x's new features are updates made to the `oj-list-view` component's treatment of smart suggestion items and the `oj-data-grid` component's support for cut, copy, paste, and autofill operations on grid data. To see a list of what's new in JET 13.0.x, go to the [JET Release Notes](#) and select **v13.0.0**. To see a list of what's new in JET 13.1.x, select **v13.1.0**.

You can upgrade to the latest JET and Visual Builder Runtime versions from your visual application's Settings editor. See [Manage Runtime Dependencies for Visual Applications](#).

New Features in Oracle Visual Builder Add-in for Excel

The version of Oracle Visual Builder Add-in for Excel bundled in Visual Builder 24.10 is 4.0. To see what's new in this release, go to the add-in's [documentation page](#) and click **4.0.0**.

Supported Browsers

Oracle Visual Builder supports the latest version of the Chrome browser running on Mac OS X and Windows. Other browsers and platforms are not supported.

Applications created using Visual Builder can run on any browser supported by Oracle JET. For details, see [What platforms are supported by Oracle JET?](#)

JavaScript must be enabled for all browsers.

Deprecated Features

Take note of features that have been deprecated and are no longer supported in Visual Builder:

Feature	Description	Notice of Deprecation	End of Support/Life
Alta theme	<p>Apps created on Visual Builder version 20.07 or earlier were created with Oracle JET's Alta theme as the base theme. The Alta theme was deprecated in JET 10 and will <i>not</i> be supported beyond JET 13. To be able to publish new versions of an Alta-based app beyond January 2024 (when JET 13 reaches End of Life), we strongly urge you to transition your app to use the Redwood theme. Starting with JET 14, only best-effort support will be available for Alta; no bug fixes or new features will be provided for Alta-only issues.</p> <p>To check the theme used by your web or mobile application, navigate to the application's Settings editor and look for the Theme field. If Theme is set to Alta, take time to redesign your app using the Redwood theme before support for the Alta theme ends.</p>	22.01 - Dec 2021	Planned for 2024
Custom enumeration type	<p>The ability to create a custom type that defines a list of enumeration values is now deprecated. Instead of creating an enumerated list as a type, you can create a variable, then use the Subtype option in the variable's Design Time tab to define your enumerated list. See Create Variables.</p>	24.10 - July 2024	24.10 - July 2024

Feature	Description	Notice of Deprecation	End of Support/Life
Implicit grant for backends and service connections	<p>The Enable implicit grant for Service Connections option used for backends and service connections in a web app has been deprecated. The change does not impact existing apps that enable this option—though it won't be available for new web apps starting from June 2024. If your existing web apps use the Enable implicit grant for Service Connections option, we recommend updating them.</p> <p>The Enable implicit grant for Service Connections option was used in conjunction with the Delegate Authentication setting found in a backend or service connection's server configuration. It enabled a direct Implicit OAuth flow with IDCS for Oracle Cloud Application REST APIs when a service connection used by the web app was configured for Delegate Authentication. Implicit OAuth is no longer a recommended option. If your existing apps use this option, take action as follows:</p> <ol style="list-style-type: none"> 1. Update the backend or service connection's server configuration in your visual application: <ol style="list-style-type: none"> a. Change any backends or service connections that use Delegate Authentication to Oracle Cloud Account authentication. b. If the REST API doesn't support CORS, change the Connection Type to Always use proxy, irrespective of CORS support; otherwise, leave the configuration as is. 2. Test the service connection from the Test tab to identify any issues. 3. Open the web app's Settings editor, then deselect the Enable implicit grant for Service Connections option in the Security tab. 4. Test the web app to make sure the service connection doesn't have any issues. <p>No action is needed if your web apps don't have Enable implicit grant for Service Connections enabled and if none of your backends/service connections are set to Delegate Authentication.</p>	24.04 - Feb 2024	Planned for November 2024

Feature	Description	Notice of Deprecation	End of Support/Life
transform behavior type for custom events	The transform behavior type for custom events is deprecated and replaced by the new transformPayload behavior type. The change does not impact existing apps with events configured to use the transform type, but the new transformPayload type addresses issues with invoking event listeners in the correct order. Where possible, users are encouraged to switch to the new behavior type.	24.04 - Jan 2024	24.04 - Feb 2024
Mobile apps	Functionality relating to mobile applications has been deprecated and removed from the product. Starting with 23.10, you will no longer be able to create a new mobile app, but you can import an existing mobile app and deploy it as a PWA. You can continue to use your existing mobile apps until July 2024 when mobile apps, including PWA-enabled ones, reach End of Life (EOL). To use your mobile PWAs beyond July 2024, we strongly urge you to transition your mobile app as a web app and deploy it as a PWA for use on mobile devices.	23.04 - Feb 2023	Planned for July 2024
Hybrid mobile apps and Apache Cordova custom plugin	Functionality relating to hybrid mobile applications (deprecated since May 2021) has been removed from the product. This means that the use of build configurations to build native .ipa and .apk files for distribution to iOS and Android devices—as well as the Cordova custom plug-in option—are no longer available. You can no longer create new hybrid mobile apps or new build profiles for existing apps; build configurations for existing apps will be ignored. For apps that target mobile devices, enabling PWA support is the recommended approach for distribution.	21.07 - May 2021	23.10 - August 2023
End of Life (EOL) for Oracle Visual Builder Classic	The Oracle Visual Builder Classic service offering has reached End of Life (EOL) and End of Support Life (EOSL), and is now no longer available. Oracle will migrate all current Oracle Visual Builder Classic instances to the service's replacement: Oracle Visual Builder Generation 2. This does not affect instances already on Oracle Visual Builder Generation 2. Instance administrators will receive email notifications with details about when their instances will be migrated, and how to prepare for the migration. For more details, see <i>Migrate Your Instance to Generation 2</i> in <i>Administering Oracle Visual Builder</i> .	Post-22.10 - Sept 2022	Sept 2022

Feature	Description	Notice of Deprecation	End of Support/Life
Select One component	The Select One (oj-select-one) component, deprecated since JET 8.1.0, has been removed from the Components palette and is visible only if you select the Show Deprecated option. Switch instead to Select Single (oj-select-single).	22.04 - Feb 2022	N/A
Oracle SaaS R13 Light Theme	The Oracle SaaS R13 Light Theme application template has been deprecated, although we will continue to support it until version 22.01 reaches End of Life (EOL). See Updating an Oracle SaaS application template for more information.	22.01 - Dec 2021	N/A
navigateToPageAction	The <code>navigateToPageAction</code> action is deprecated in 21.07. When you upgrade your app to version 21.10, any existing action chains that use <code>navigateToPageAction</code> are automatically migrated to <code>navigateAction</code> (introduced in 21.07).	21.07 - May 2021	N/A
Internet Explorer 11	Visual Builder runtime has deprecated the use of Internet Explorer 11 since 19.4.3. Users who try to access a deployed Visual Builder application from Internet Explorer will see a deprecation warning. Starting with 21.04, Oracle Support will no longer address issues pertaining to Internet Explorer 11.	19.4.3 - Aug 2020	21.04 - Feb 2021
Processes in Visual Builder	<p>The following Process-related features are deprecated:</p> <ul style="list-style-type: none"> Register deployed processes Use of Process Actions in Action Chains Support for Process code snippets Process-related Quick Starts <p>You can still use these features in Oracle Integration Generation 2, but as you plan the transition to Oracle Integration 3, you should leverage service connections instead to interact with Process.</p> <p>To leverage OCI Process Automation (Oracle Integration 3) in your application, create an OCI Process Automation backend based on your instance, then create service connections for the REST APIs you want to use in your visual application. See Connect to Oracle Process Automation APIs for more information.</p>	24.04 - Feb 2024	Not available in Oracle Integration 3 and beyond

Upgrade Policy

When you create a new visual app, Visual Builder automatically sets your runtime dependencies to the latest Visual Builder runtime and JET versions. If you've already staged or published an app, however, it's up to you to decide when to upgrade, as long as you do so within a certain time period.

As a general rule, you can run a published Visual Builder application built on the current runtime version, and continue running it on the three previous versions—but new **Visual Builder runtime** libraries are released with new versions of the **Visual Builder Studio design time** (around four times a year). The Visual Builder design time is only updated twice a year, so it gets only two of those four versions (another reason we recommend using Visual Builder Studio as your design environment). As a result, you need to upgrade every other release in Visual Builder, while in Visual Builder Studio, you upgrade after four releases, with the design time supporting the last three versions.

So if you built your app in 24.10 (for example), Visual Builder supports the app not only on the 24.10 runtime version, but also on 25.01, 25.04, and 25.07. Once 25.10 comes out, however, support for the 24.10 runtime version will drop off, so we'll ask you to upgrade your app before you can work on it in the Designer. If you choose not to upgrade at that time, you run the risk that newer browser versions will break your app. You also won't be able to take advantage of any important security and performance improvements. For all of these reasons, we encourage you to build time into your development cycle to keep abreast of current changes, and to make sure you upgrade your app (you should version it first) **before** support for your current runtime version expires.

See [Manage Runtime Dependencies for Visual Applications](#) for details on how to upgrade.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Oracle Cloud What's New in Oracle Visual Builder, 24.10.0
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