New Features in Oracle Visual Builder Studio

Here's an overview of new features and enhancements added recently to Oracle Visual Builder Studio (VB Studio).

Topics:

- Release 24.07 - April 2024
- Release 24.04 - March 2024
- Release 24.01 - December 2023
- Release 23.10.1 - October 2023
- Release 23.10 - September 2023

As soon as new and changed features become available, VB Studio 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.

Release 24.07 - April 2024

Area	Feature	Description
DevOps	Jobs and pipelines	• Wait time for manual approval You can now specify how long a manual approval will wait for an approval before it expires and automatically rejects that approval. See steps 15 and 16 in Add a Manual Approval Item to Your Pipeline at Design Time and Approve the Manual Approval when the Pipeline Runs. • Rules specific to a job or pipeline In the Job Protection and Pipeline Protection pages, when a job or pipeline is protected by one or more rules, you can show the rules that apply for the specific job or pipeline. See Configure Job Protection Settings and Protect Your Pipeline: Restrict Who Can Start It Manually or Edit Its Configuration.
	Git and merge requests	• Option to set cloning depth The job configuration's Advanced Git options provide support for setting the cloning depth, which you can use to specify the number of commits to grab when you clone. The Git Shallow Clone Depth Option setting ensures that less data is pulled to reduce the build time and is by default, set to 1. See "Set the depth for cloning" in Advanced Git Options. • Group reviewer You can specify a group as a reviewer when you create a merge request from the command line. Previously, you could only create individual reviewers this way. See Create a Merge Request from the Command Line. • Option to delete review branch after merge A selectable option for deleting the review branch after merging a Merge Request into the target branch has been added to the Branch Protection page. See Set Review and Merge Restrictions on a Repository Branch. When this option is enabled, the Delete branch option under Post Merge Actions in the Merge dialog is also enabled by default. You can still bypass branch deletion by selecting No in the confirmation dialog, or you can select Yes to delete the branch after the merge. See step 5 in Merge Branches.
	New markdown parser	VB Studio now uses a new markdown parser to ensure that markdown is rendered consistently throughout the user interface. See Working with Markup Languages in VB Studio.

Area	Feature	Description
	Toolbar for merge request comments	Users entering MR comments can take advantage of a new toolbar that simplifies many text formatting tasks, entering links, working with lists, and adding images and files to those comments. See Add an Attachment (Image or File) to a Merge Request Comment and Use the Toolbar to Add an Image to a Merge Request.
	New software versions	The following new software versions are available for build executor templates: • Docker 25 or later on OL8, 19.03.11 or later on OL7 • Firefox ESR 115.5.0 or later • Java SE 17.0.10 • Node.js Driver for Oracle Database 6.2.0 or later • Oracle Instant Client 12c 21.12.0.0.0 or later, 19.15.0 • Oracle JDeveloper Studio 12.2.1.4.0 (automatic upgrade from 12.2.1.3.0) • Oracle SOA Suite 12 12.2.1.4.0 (automatic upgrade from 12.2.1.3.0) • Oracle JET cli 16.0.0 or later • Podman 4.6.1 or later (OL8) • SQLcli 23.3.0.0 See Software for Build Executor Templates.
Visual Applications	Dark theme for web apps	When you create a *new* 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.
Extensions	Option to bypass CI/CD pipelines for deployment	You now have the option of deploying your extension directly to your development environment without using CI/CD pipelines. CI/CD pipelines provide advanced functionality, for example, they allow you to deploy dependent artifacts to the target environment in parallel or delete extensions to clean up the environment. If you don't need this functionality, you can opt to disable pipelines for deploying your extension. See Enable or Disable the CI/CD Pipeline for Publishing.

Area	Feature	Description
	Option to isolate extension workspace/ repo by pillar	When you use the **Edit Page in Visual Builder Studio** option to customize Oracle Cloud Applications, it's now possible to isolate extensions by product family (*pillar*) into separate workspaces and repositories. For example, you can use one workspace/repo for editing all HCM pages and another workspace/repo for editing CX pages —though you can still edit all of your pages in the same workspace/repo, if that's what you want. With this update, the default workspace name generated when you switch over to VB Studio typically uses the pillar of the page you're trying to extend, for example, `Workspace HCM`. See Configure an Oracle Cloud Application.
	Dependencies grouped by pillar	Dependencies are now grouped by pillar in the Dependencies pane, making it much easier to find the one you want to add to your App UI. See Add a Dependency.
	Core Pack replacement for Legacy components	**Note:** This feature requires Oracle Cloud Applications 24C or later (with JET 16.*x*). When your extension uses the default Redwood theme, several Core Pack components now replace their Legacy versions, for example, `oj-c-input-text` has replaced `oj-input-text`. While this change does not impact an existing extension, dragging and dropping one of these components afresh from the Components palette will use the Core Pack version in your extension's pages. See Work With JET Core Pack Components.

Area	Feature	Description
	Improved usability of condition builder	• Support for selecting field values from list-of-values (LOV) The condition builder now supports selecting values by name from a list for fields controlled by an LOV. For extensions in Advanced mode, see Set Conditions for an Extension Rule, for Express mode, see Set Conditions for an Extension Rule. • Improved support for standard functions and actions in Advanced Expression editor The list of functions in the Actions palette now includes standard functions provided by Oracle developers. You can drag the functions from the palette into the expression, and configure them in the Properties pane. The Advanced Expression editor now provides better support for defining actions when creating expressions. Creating conditions using the If action has been improved, so you can now select criteria, operators, and values using dropdown lists in the expression builder's Properties pane. For extensions in Advanced mode, see Build Advanced Expressions, for Express mode, see Build Advanced Expressions. • Condition builder changes saved automatically When you make changes in the condition builder for business rules and validations, your changes are now saved automatically.
	Support for $objectContext parameters	The condition builder for business rules and validation messages now supports parameters defined in the $objectContext. Parameters in the $objectContext can also be used when creating conditions in the Advanced Expression editor, and in expressions for setting the default values in business rules. In Advanced mode, you can view the list of the Object Context parameters and their definitions in the Context tab. See Use Context Parameters in Extensions.
	Default value in business rules support LOVs	The Business Rules editor now supports setting a default value for fields controlled by an LOV by selecting a name in a list of values. For extensions in Advanced mode, see Set a Default Value for a Field, in Express mode, see Set a Default Value for a Field.
	Express mode enhancements	• Support to create sections in containers Support for containers has been improved in Express mode to allow you to create sections in the container's rules editor. You can also edit the name, description, and input parameters of new sections in the Properties pane. See Control the Sections Displayed on the Page. • Page title in Properties pane The Properties pane in Express mode now displays the page title.

Area	Feature	Description
Common to Visual Applications and Extensions	Enhanced variable and type creation	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. For visual apps, see Create Variables and Create Types; for extensions, see Create Variables and Create Types. With this update, the ability to create a custom type that defines a list of enumeration values is deprecated. See Deprecated Features.
	Single environment auto-selected during workspace creation	When your project has only one environment, it is now automatically selected for you when creating a Visual Application or Application Extension workspace. For visual apps, see Create a Workspace; for extensions, see Create an Extension.
	New `dirtyDataStatus` property in `vbBeforeExit` payload	If you track changes in a variable's state to detect unsaved changes, you can now use the `vbBeforeExit` event listener's `dirtyDataStatus` 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. For visual apps, see Add a Get Dirty Data Status Action; for extensions, see Add a Get Dirty Data Status Action.
	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. For visual apps, 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; for extensions, see Create Action Chains in Design Mode, Add an If Action, Add a Switch Action, and Add a Run In Parallel Action.
	Usability improvements	• 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 (x) (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. For visual apps, see Create Event Listeners for Events; for extensions, see Create Event Listeners for Events.

24.04 Runtime Version

This release of VB Studio uses Oracle JET 16.0.*x* libraries and components. We recommend that you upgrade your VB Studio apps to this latest JET version, as well as to the 24.07 Visual Builder Runtime, to take advantage of the full spectrum of 24.07 features. To see a list of what's new in JET 16.0.*x*, go to the JET Release Notes and select **v16.0.0**.

You can upgrade to the latest JET and Visual Builder Runtime versions from your app's Settings editor. See Manage Runtime Dependencies for Visual Applications.

Release 24.04 - March 2024

Area	Feature	Description
DevOps	Security	• Per-user limit on personal access token creation Admins can now limit the number of tokens a user can create; they can also set up rules for handling expired tokens. Users who reach the organization-wide limit will see messages that they cannot create additional tokens without deleting some first. These messages are also available in the Maven and NPM pages, when users are setting up connections. See Limit the Number of Personal Access Tokens a User Can Create or Set Up Token-Based Authentication. • Option to retain OCI credentials for export/import A check box for retaining OCI credentials has been added for Export/Import Data project administration operations. This option allows the system to remember OCI credentials, instead of requiring them to be re-entered each time. You can deselect the option to perform an export/import operation, effectively clearing the stored credentials. See Export and Import Project Data.

Area	Feature	Description
	Builds and pipelines	• Enable and Disable options in Jobs Overview List The Jobs Overview List menu now includes Enable and Disable options, matching the options available in the Job Details Actions menu. See Create and Manage Jobs. • Comments for manual pipeline approval or rejection The Pipeline Manual Approval process now allows approvers to add more information about why they are approving or rejecting a pipeline run. See Approve the Manual Approval when the Pipeline Runs. • Support for regular expressions in build and pipeline protections Using regular expressions for pattern matching in build and pipeline protections is now supported. See Configure Job Protection Settings and Protect Your Pipeline: Restrict Who Can Start It Manually or Edit Its Configuration. • Permissions check for job/pipeline operations The operations to create a new job or pipeline, or rename existing ones, now checks the user permission and only allows the operation to continue if the user would have access to their own job or pipeline. See Create and Manage Jobs or Create and Manage Pipelines. • Software updates New software bundles for Nodejs 18.x and Nodejs 20.x are available. See Software for Build VMExecutor Templates.
	Merge requests	• Option to revert a merge request It now just takes a single click to revert an MR. VB Studio creates a new branch with the revert and starts a new review for you. See Revert a Merge Request. • Option to copy a branch name A new button was added to the Merge Request page to simplify copying the branch name. See Create a Merge Request. • Improved merge message In the Merge dialog, the merging message indicates which merge option (merged, merged and squashed, merged and rebased) was used to complete the merge operation. The message also displays the range of commits in the MR. See Merge Branches.
Visual Applications	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 for Sharing.

Area	Feature	Description
	Prerendered pages for improved SEO	In an effort to improve search engine optimization (SEO), VB Studio 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 `vb-prerender-cache-warm` 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.
	Page header fragment	New pages in web applications now include a `page-header` 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. ✏ **Note:** Pages created with version 24.01 or earlier will not be affected. These pages will maintain their original structure even after your app is upgraded to 24.04.
	Favicons for light and dark themes	With support for a dark theme, favicons can now be set independently for light and dark themes for each application in your visual application. 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.
	Support for OCI Process Automation	Oracle Cloud Infrastructure Process Automation, a service that quickly automates business approval workflows, can now be integrated in VB Studio. 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. With OCI Process Automation now supported, the following Process-related features are deprecated: • Register deployed processes • Use of Process actions in action chains • Support for Process code snippets • Process-related quick starts See Deprecated Features.

Area	Feature	Description
	Grunt option to redeploy a visual app from another project	If you've already deployed a visual application to the Visual Builder runtime instance in your environment, you can now use the `forceProject` option with the `vb-deploy` Grunt command to deploy the same app from a different project and/or Git repo. See vb-deploy.
Extensions	Global functions	When your application routinely uses similar JavaScript functions to transform or manipulate data, you can now extract those functions as global functions and reuse them in pages (fragments or any other container), both within and across extensions. See Add JavaScript Modules As Global Functions.
	Changes to App UI settings	The **Show in Ask Oracle** property in the flow-level Settings editor, which adds a flow to the Oracle Cloud Application or Ask Oracle Navigator menu, is now changed as **Add to Oracle Cloud Applications menu**. This property has also been removed from the page-level Settings editor.
		The **Add to Oracle Cloud Applications menu** property is now automatically enabled for an App UI's default flow, so the default flow always appears in the Navigator menu. For non-default flows, you must still make this selection manually.
		Further, when the **Add to Oracle Cloud Applications menu** property is selected to display a flow (default or otherwise) in the Navigator menu, the **Let other App UIs navigate to this flow** property is also selected, so navigation from other App UIs is always enabled to the default page in that flow.
		See Manage a Flow's Settings.
	Support for External FlexFields in business rules	EFF (External FlexField) segments are now listed in Regions and Fields for business rules. A user can now configure the Required, Hidden, and Read Only properties of an EFF segment. See Set Properties for Regions and Fields.
	Advanced Expression editor	You can now create more complex expressions in JavaScript using a new Advanced Expressions editor. The editor's palette contains a set of actions based on JavaScript functions, and also supports the extension's global functions. The editor can be used in Validation rules to create conditions, and in business rules for creating conditions and defining default values. See Build Advanced Expressions.
		This functionality is also supported in Express mode.

Area	Feature	Description
	Support for Validation message	You can now add rule-based validation messages to dynamic layouts in pages that use business rules. Validation rules allow users to configure rule-based validation error and warning messages. You create conditions for Validation rules using a conditon builder (as in the Business Rules editor), and define the messages that are displayed when the conditions are met.See Display Messages When Conditions are Met This functionality is also supported in Express mode.
	Express mode enhancements	Express mode now supports editors that were only available in Advanced mode: • You can now configure the sections displayed in containers using a Rules editor. See Work With Container Sections. • For pages based on rule sets, you can now use a Rule Sets editor to confgure layouts. See Control Your Display With Rule Sets. You can now view and edit page constants directly in the Properties pane. See Work With Constants.
Common to Visual Applications and Extensions	Dark theme	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. For visual apps, see Tour the Designer; for extensions, see What is the Designer? This functionality is also supported in Express mode.
	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 VB Studio. 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. For visual apps, see Create Variables to Temporarily Store Data in a Buffer; for extensions, see Create Variables to Temporarily Store Data in a Buffer.
	Build-related logs	You can now troubleshoot build-related issues that prevent your app from being shared or deployed. Build logs are available in a new **Logs** tab at the bottom of your browser. For visual apps, see Troubleshoot Build Issues; for extensions, see Troubleshoot Build Issues.

Area	Feature	Description
	Audit improvements	We've made several improvements, including performance updates, to enhance the auditing experience, key among them being: • 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. For visual apps, see Audit Application Code; for extensions, see Debug and Audit Your Code.
	Event and action chain changes	We've made several enhancements to improve the design-time experience when working with events and action chains. We also renamed the **Actions** tab as **Action Chains**. Other enhancements include: • Changes to the Assign Variable action – 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. – Consecutive Assign Variable actions are now consolidated into a single action. For visual apps, see Add an Assign Variable Action; for extensions, see Add an Assign Variable Action. • Support to drag and drop an action into an else branch You can now drag and drop an action into an `else` branch on the canvas. • Event editor updates to improve developer productivity 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/varId}*Listener**. For visual apps, see Create Event Listeners for Events; for extensions, see Create Event Listeners for Events.

Area	Feature	Description
	Quick start enhancements	• Quick start in endpoint picker for customized fragment variable display 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. For visual apps, see Customize How a Fragment Variable is Displayed in the Properties Pane; for extensions, see Customize How a Fragment Variable is Displayed in the Properties Pane. • Automatic endpoint selection in collection quick starts When using a business object or a service with expected endpoints, VB Studio 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. For visual apps, see Use the Create Page Quick Start, Use the Add Edit Page Quick Start, and Use the Add Detail Page Quick Start; for extensions, see How Do Quick Starts Work?

Area	Feature	Description
	General improvements	• Core Pack in Components palette 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. For visual apps, see Add Components to Pages; for extensions, see Add Components to Pages. • Highlighting of default flow/page in the navigator The default page and flow within your app are now badged as `default` in the navigator for easier identification. This way, you can quickly identify the entry points for your app without having to check artifact configuration. For visual apps, see How are Applications Structured?; for extensions, see How Are App UIs Structured? • Page input parameters from parent flows 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. For visual apps, see Enable Variables as Input Parameters; for extensions, see Enable Variables as Input Parameters.

24.04 Runtime Version

This release of VB Studio uses Oracle JET 15.1.*x* libraries and components. We recommend that you upgrade your VB Studio apps 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 app's Settings editor. See Manage Runtime Dependencies for Visual Applications.

Release 24.01 - December 2023

Area	Feature	Description
DevOps	Option for project owners to change workspace ownership	A project owner can now change the ownership of any workspace that no longer has an owner. This is useful, for example, if the owner leaves the company or is unavailable when a merge conflict arises. See Manage Workspaces.
	Email notifications for user group changes	Email notifications are now sent to users in a particular user group when that group is added to or removed from a project, or when that group's membership privileges are changed. See Manage Local VB Studio Groups.
	Job and pipelines	• Job and pipeline protection options Users can now use the Job and Pipeline protection options to prevent changes to their job and pipeline configurations, while still allowing other users to run these jobs and pipelines. An administrator, such as the project owner, can protect settings in any job or pipeline regardless of ownership. When a job or pipeline is protected, users who are not allowed to edit the configuration will no longer see the **Configure** option on the **Action** menu on the Jobs Overview or Pipelines Overview pages. See Configure Job Protection Settings and Protect Your Pipeline: Restrict Who Can Start It Manually or Edit Its Configuration. • Pipeline search You can now search for pipelines on the Pipeline Protection page under the Project Administration Builds tile. This feature makes it quicker and easier when you have a long list of pipelines to sort through to find the one you want to protect. See Step 4 in Protect Your Pipeline: Restrict Who Can Start It Manually or Edit Its Configuration.
	Default Wiki home page	VB Studio now supports a default Wiki Home page. You can create the Wiki Home page when you start working on pages for the project or, if you already have several wiki pages, you can provide a more coherent structure under a new Wiki Home. You'll also now find the My Drafts button on the Wiki Home page, which you can quickly access using the page's breadcrumbs. See Create and Manage Wiki Pages.
	Templates for merge requests	You can now use a description template to improve the quality of the descriptions used with merge requests. Templated descriptions help focus the reviewers' attention on the changes made in the branch's code. See Use Templates to Improve MR Descriptions.

Area	Feature	Description
	Regular expressions in webhooks for event notifications	Regular expressions can now be used to define matching patterns for branches in the Slack, Hudson/Jenkins Build Trigger, and Hudson/Jenkins Git Plugin webhooks. You can still use the selector to choose a specific branch for configuration. See: • Step 7 in Configure a Slack Webhook in VB Studio to Send Event Notifications • Step 9 in Configure a Hudson/Jenkins Git Plugin Webhook • Step 10c in Configure a Hudson/Jenkins Build Trigger Webhook.
Visual Applications	Business objects	• 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 (`diagram.json`) to fix the error.
Extensions	Improvements for **Edit Page in Visual Builder Studio** workflow	When you use the **Edit Page in Visual Builder Studio** option to customize Oracle Cloud Applications, you can now take advantage of these enhancements: • Option to re-use existing workspaces If you have an existing workspace in a project, you can now re-use that workspace; in fact, VB Studio will automatically open that workspace for you, instead of creating a new workspace and Git repo whenever you edit a page for the first time. • Option to request project membership You can now request membership to a project directly from the wizard. VB Studio will send a request on your behalf to the project owners and notify you when you've been added to the project. Previously, you had to take note of the project owner's email and follow up on your own. See Configure an Oracle Cloud Application.
	Support to customize constants/components displayed in Page Designer's properties	You can customize how constants and dynamic components are organized and displayed in the Page Designer's Properties pane. Instead of an alphabetical list of extendable components and constants that show in separate tabs, you can now use a new page-level **Design Time** editor to organize items in a particular order, even group them in sections. See Organize How Constants are Listed in the Properties Pane.

Area	Feature	Description
	Business rule enhancements	• Improved condition builder
		You can now select which criteria you want to include in a business rule's conditions, and add and remove conditions in the condition builder. You can also now group conditions to create more complex rule conditions. See Set Conditions for an Extension Rule.
		This functionality is also supported in Express mode for HCM extensions. See Set Conditions for an Extension Rule.
		• Ability to nest business rules
		It's now possible to nest business rules. Nested rules enable you to use simple conditions to build more complex sets of rule conditions. See Use Nested Rules.
		This functionality is also supported in Express mode for HCM extensions. See Use Nested Rules.
	Role-based security for App UIs	You can now use roles defined in your Oracle Cloud Applications instance to control access to your App UI, as well as to individual flows and pages in the App UI. See Control Access to Your App UI.
	Local server for backends/service connections	You can now use a "local server" to override a backend's default server, allowing you to use a server definition more suitable for development. This way, you can connect to a server using (for example) Basic Authentication and add a static Authorization header that is used only during development, without those details going into the source code. See Add a Local Server to Use a Different Backend Definition During Development.
	Extension ID in Deployments tab	The Deployments tab now includes the extension ID, which you can use in a build step to delete an extension. Previously, you had to retrieve the identifier from the `vb-extension.json` file. See step 12 in Configure a Job to Delete an Extension.
	Classic application extensions no longer supported	Classic application extensions are no longer supported. With this change, you can no longer create new classic extensions from the Workspaces page or the New Project wizard. If the older version of your Oracle Cloud Application has been migrated to the newer App UI structure, you can find the new version of your app, which typically has a URL in the format `<hostname>/fscmUI/redwood/<appname>`. Once you do, click the **Edit Page in Visual Builder Studio** option to start building and configuring App UIs. Contact Oracle support if you need help.

Area	Feature	Description
Common to Visual Applications and Extensions	Page Designer improvements	• Option to reopen closed tabs 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. For visual apps, see Tour the Designer; for extensions, see What is the Designer? • Live/Design toggle change 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. For visual apps, see Use the Page Designer; for extensions, see Use the Page Designer.
	JavaScript action chain enhancements	• New options for local functions You can now *convert* 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 *create* 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. For visual apps, see Design Editor; for extensions, see Design Editor. • Summary button to simplify action chain view 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. For visual apps, see Design Editor; for extensions, see Design Editor. • Simplified display for action parameters 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.

Area	Feature	Description
	New behavior type for custom events	The `transform` behavior type for custom events is deprecated and replaced by the new `tranformPayload` behavior type for *new* event listeners. The change does not impact existing apps with events configured to use the `transform` type, but the new `tranformPayload` 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. For visual apps, see Choose How Custom Events Call Event Listeners; for extensions, see Choose How Custom Events Call Event Listeners.

Area	Feature	Description

	Fragments	• Fragments as sections for dynamic containers
		
		It's now possible to add fragments as sections in a dynamic container. By default, all fragments tagged as `pageContent` 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. For visual apps, see Add Fragments as Sections in a Dynamic Container; for extensions, see Add Fragments as Sections in a Dynamic Container.
		
		• InstanceFactory types for fragments
		
		Types from code, known as *InstanceFactory* 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. For visual apps, see Create a Type From Code; for extensions, see Create a Type From Code.
		
		• New properties for fragment slots
		
		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. For visual apps, see Add Slots to a Fragment; for extensions, see Add Slots to a Fragment.
		
		• Drag and drop for fragment slots
		
		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. For visual apps, see Add Slots to a Fragment; for extensions, see Add Slots to a Fragment.
		
		• Improvements on customizing fragment variable display in the Properties pane
		  – If your fragment variable uses an array of primitives (for example, `string[]`), you can now edit the fragment's JSON to display a drop-down menu showing all values for each item in the array. For visual apps, see **Subtypes and valueOptions for arrays** in Customize How a Fragment Variable is Displayed in the Properties Pane; for extensions, see **Subtypes and valueOptions for arrays** in Customize How a Fragment Variable is Displayed in the Properties Pane.
		  – 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. For visual apps, see Section

Area	Feature	Description
		Fragment Properties for Display in the Properties Pane; for extensions, see Section Fragment Properties for Display in the Properties Pane.

24.01 Runtime Version

This release of VB Studio uses Oracle JET 15.0.*x* libraries and components. We recommend that you upgrade your VB Studio apps to this latest JET version, as well as to the 24.01 Visual Builder Runtime, to take advantage of the full spectrum of 24.01 features. To see a list of what's new in JET 15.0.*x*, go to the JET Release Notes and select **v15.0.0**.

You can upgrade to the latest JET and Visual Builder Runtime versions from your app's Settings editor. See Manage Runtime Dependencies for Visual Applications.

Release 23.10.1 - October 2023

Area	Feature	Description
Visual Applications	Option to create workspace without an environment	You can now create an application workspace without an environment. This way, you get a chance to try out the visual development experience that VB Studio offers. While this setup has some restrictions—you won't be able to use business objects or deploy your app—you can define a connection to an external REST service, design your app's pages, and preview the app as it would appear to users. See Create a Workspace Without an Environment. It's also possible to create a project without an environment. See Without an Environment.
DevOps	Software versions	The Fn version in the System Default OL7 for Visual Builder template has been updated to 0.6.26. See Software for Build Executor Templates.

Release 23.10 - September 2023

Area	Feature	Description
DevOps	Option to request project membership	You can now request to join projects that you don't have access to just by clicking a new **Request Membership** option, available on a project's Actions menu on the Organization page. VB Studio will send a request on your behalf to the project owners and notify you when you've been added to the project. See Request Membership in a Project You Can't Access.

Area	Feature	Description
	Changed options for Oracle Integration instances	On the Add Service Instance page, the default OCI compartment selection has been changed to Root and a Region selector has been added. See Add an Oracle Integration Instance to an Environment.

Area	Feature	Description
	Enhancements for Builds and Pipelines	• Private pipelines Project owners can now set their pipelines as private and add users and/or groups that can view, edit, and run the pipelines. Users and groups that aren't in the allowed list won't be able to see the pipeline details, edit its configuration, or start it manually. See Protect Your Pipeline: Restrict Who Can Edit Its Configuration. • Pipeline approval details in activity feed Approval-related pipeline events, including when a pipeline is paused for approval, approved or rejected, and when the pipeline resumes after approval, are now displayed in the project's activity feed. See Add Manual Pipeline Approvals. • Variables for build triggers You can now use the STARTED_BY, STARTED_BY_ORIGIN, and STARTED_BY_UPSTREAM build variables to see what triggered a build (a user, a commit, a pipeline, or a periodic trigger), in addition to what started the first build that started the pipeline and what upstream jobs participated in the pipeline run. These additions provide more information in build logs and also make it possible to identify the logged-in user as a variable and pass its value as a parameter. See Build Executor Environment Variables. • VM creation limits display The VM creation limits are now presented in a much easier-to-read format. See Add and Manage Build VMs. • Edit button for Build executor templates On the Build Executor Templates page, the **Edit** icon that was formerly found in the template list to the left has been replaced with an **Edit** button on the right of the template panel, next to the **Delete** button. See Create and Manage Build Executor Templates. • Docker summary Docker now conveniently displays a summary of how many images are in use and the number of images, if any, that are in an error state. This display is similar to the equivalent information provided for Compute VMs. See Add Your First Docker Deployment VM. • JVM options for SQLcli builds The interface for SQLcli build steps provides a new field for adding JVM options. See step 15 in Configure a Job to Run SQLcl Commands. • New REST call for Jobs API A new REST API call to the VB Studio Jobs API now allows you to programatically get a build's log.

Area	Feature	Description
		The API call returns the log file that you can store, with Splunk for example, and then analyze. See REST API for Oracle Visual Builder Studio.
	Issue archiving	You can now archive issues, which helps clean up old, obsolete, descoped, or decommissioned issues and avoids overloading the backlog. Archived issues display an **Archived** badge to the left of the summary text, but only in Agile backlogs, active sprints and reports. See Archive Issues.
	Software updates	• Support for Podman You can now select a Podman software bundle on the OL8 Build Executor template. See Software for Build VM Templates. • Support for JDeveloper and FindBugs Support for the deprecated JDeveloper Studio 11 and FindBugs software bundles is now dropped. See Deprecated Features.
Visual Applications	Mobile apps deprecated	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. 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. See Convert a Mobile PWA to a Web PWA.
Extensions	Simplified access for HCM apps	Users extending Oracle Cloud Applications in the HCM pillar will land in a new *Express* mode when they access pages in VB Studio. Express mode is a slimmed-down VB Studio experience, meant for functional administrators who use business rules to determine the logic governing runtime behavior. A toggle switch in the Designer's header provides easy access to Advanced mode, which provides the full suite of Designer functions. If you're looking to work with business rules in Express mode, What Can You Do with Oracle Visual Builder Studio in Express Mode? has everything you need. Advanced users can refer to Control Your Display with Business Rules.

Area	Feature	Description
Common to Visual Applications and Extensions	Slots in fragments	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. For visual apps, see Add Slots to a Fragment; for extensions, see Add Slots to a Fragment.
	Service/backend enhancements	• Backends mandatory for new service connections If you're looking to create a *new* 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. • Default service name change New service connections no longer include a default name. You can now specify your own service name for easier identification. For visual apps, see Create a Service Connection from the Catalog, Create a Service Connection from a Service Specification, and Create a Service Connection from an Endpoint. For extensions, see Create a Service Connection from the Catalog, Create a Service Connection from a Service Specification, and Create a Service Connection from an Endpoint.
	Enhanced payload for `vbBeforeExit` event	The `vbBeforeExit` 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.

Area	Feature	Description
	Usability improvements for action chains	• List view for Actions palette 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. For visual apps, see About the Action Chain Editor; for extensions, see About the Action Chain Editor. • "Surround With" options 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. For visual apps, see Design Editor; for extensions, see Design Editor. • Code insights 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. For visual apps, see Code Editor; for extensions, see Code Editor.
	Other enhancements	• 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. For visual apps, see Tour the Designer; for extensions, see What Is the Designer? • Audit improvements We've made several performance improvements to enhance application auditing. As a part of this, a new **Opened Artifacts** setting audits only artifacts that are currently open. To audit the entire application, change this setting to **All Artifacts**. For visual apps, see Audit Application Code; for extensions, see Debug and Audit Your Code.

23.10 Runtime Version

This release of VB Studio uses Oracle JET 14.1.*x* libraries and components. We recommend that you upgrade your VB Studio apps 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 app'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 VB Studio 24.07 is 3.8. To see what's new in this release, go to the add-in's documentation page and click **3.8.0**.

Supported Browsers

Visual Builder Studio 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 Studio can run on any browser supported by Oracle JET. For details, see What platforms are supported by Oracle JET?

JavaScript must be enabled for the browser.

Deprecated Features

Take note of features that have been deprecated and are no longer supported in VB Studio:

Area	Feature	Description	Notice of deprecation	End of support
DevOps	Software packages for Build executor templates	The SOA 12.2.1.3.0 software bundle is deprecated in the 23.10.0 release; support for it will be dropped in a future release.	23.10 - Aug 2023	Planned for a future release in 2024
		The JDeveloper Studio 12.2.1.3.0 software bundle is deprecated in the 23.10.0 release; support for it will be dropped in a future release.	23.10 - Aug 2023	Planned for a future release in 2024
		The FindBugs software bundle was deprecated in the 23.07.0 release. Starting with 22.10.0, this version is no longer available.	23.07 - April 2023	23.10 - August 2023
		The JDeveloper Studio 11 software bundle was deprecated in the 23.07.0 release. Starting with 22.10.0, this version is no longer available.	23.07 - April 2023	23.10 - August 2023
		The Docker 17 software bundle was deprecated in the 22.10 release. Starting with 23.01.0 (Nov 2022), all instances of this bundle were automatically upgraded to Docker 20.	22.10 - Aug 2022	23.01 - Nov 2022

Area	Feature	Description	Notice of deprecation	End of support
		The Docker 1, Java 7, Node.js 10 and 12, Python3 3.6, SQLcl 19, and Oracle ATG 11 versions of software packages used in Build executor templates have been deprecated since 22.04 and are no longer available. Where possible, users are encouraged to move to later versions of these bundles: • Docker 1 to Docker 20 • Java 7 to Java 8 • Node.js 10 and Node.js 12 to Node.js 14 • Python3 3.6 to Python3 3.7 • SQLcl 19 to the latest SQLcl version See Software for Build Executor Templates.	22.04 - Feb 2022	22.07 - May 2022
	Java versions for Build executor templates	The Java 18 software package, which Oracle dropped support for in December 2022, has been replaced with a Java 19 package. The following automatic updates have been made: • Build executor templates that included Java 18 were configured to include Java 19 instead. • Job configurations that used Java 18 were configured to use Java 19 instead.	23.01 - Nov 2022	23.04 - Feb 2023
		Java 1.8.x is deprecated in the 22.10.0 release. Java 17.x has been added as the default to all system build executor templates. Oracle recommends that you upgrade any of your jobs that currently use Java 1.8.x to one of the later supported versions.	22.10 - Aug 2022	22.10 - Aug 2022
	OL6 for Build executors	Support for running Build executors on Oracle Linux 6 (OL6) has been deprecated since 22.04. Existing Build executor templates that were created for OL6 will be migrated automatically to use Oracle Linux 7 (OL7). The following software, which only runs on OL6 in those templates, will also be migrated: • Docker 1 will be migrated to OL7 and Docker 20 • Node.js 10 will be migrated to OL7 and Node.js 14	22.04 - Feb 2022	22.07 - May 2022
	Forms 12.2.1.3	Build executor template support for Oracle Forms 12.2.1.3.0 has been dropped since 22.01. Starting with 22.04 (February 2022), templates that included Forms 12.2.1.3.0 have been automatically migrated to use Forms 12.2.1.4.0 instead.	22.01 - Dec 2021	22.04 - Feb 2022

Ar ea	Feature	Description	Notice of deprecation	End of support
	SSH tunnel for JCS deployment	Support for using the SSH tunnel protocol in build steps for deployments to an Oracle Java Cloud Service (JCS) instance has been dropped. The Oracle WebLogic RESTful Management Interface protocol is now the only supported protocol for JCS deployments.	22.01 - Dec 2021	22.04 - Feb 2022
Vis ual Ap plic ati on s	Alta theme	Apps created on VB Studio 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 *not* 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. 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.	22.01 - Dec 2021	Planned for 2024
	Custom enumeration type	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.	24.07 - April 2024	Planned for July 2024

Ar ea	Feature	Description	Notice of deprecation	End of support
	Implicit grant for backends and service connections	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.	24.01 - Nov 2023	Planned for May 2024

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:

1. Update the backend or service connection's server configuration in your visual application:

    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.

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**.

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Ar ea	Feature	Description	Notice of deprecation	End of support
	`transform` behavior type for custom events	The `transform` behavior type for custom events is deprecated and replaced by the new `tranformPayload` behavior type. The change does not impact existing apps with events configured to use the `transform` type, but the new `tranformPayload` type addresses issues with invoking event listeners in the correct order. Where possible, users are encouraged to switch to the new behavior type.	24.01 - Nov 2023	24.01 - Nov 2023
	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 April 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 - April 2021	23.07 - April 2023
	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

Area	Feature	Description	Notice of deprecation	End of support
	`navigateToPageAction` action	The `navigateToPageAction` action is deprecated in 21.07. When you upgrade your app to version 21.10 or later, any existing action chains that use `navigateToPageAction` are automatically migrated to `navigateAction` (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 VB Studio	The following Process-related features are deprecated: • Register deployed processes • Use of Process actions in action chains • Support for Process code snippets • Process-related quick starts You can still use these features if you're using an Oracle Integration Generation 2 runtime instance in your environment, but as you plan the transition to Oracle Integration 3, you should leverage service connections instead to interact with Process. 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.	24.04 - Feb 2024	Not available in Oracle Integration 3 and beyond

Upgrade Policy

When you create a new visual app, VB Studio automatically sets your runtime dependencies to the latest Visual Builder Runtime and JET versions. If you've already deployed (shared 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, VB Studio supports applications built on the current Runtime Version, as well as the three previous versions. So for 24.07, for example, VB Studio supports not only the 24.07 Runtime Version, but also apps built with 24.04, 24.01, and 23.10. Once 24.10 comes out, however, support for the 23.10 Runtime Version will drop off, so we'll ask you to upgrade those apps before you can work on them 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.

Getting Oriented

VB Studio brings you all the functionality previously available with Oracle Developer Cloud Service. You also get the ability to build web and mobile applications in the Visual Builder Designer, as well as to extend certain Oracle Cloud Applications to customize the UI for your business needs.

VB Studio offers end-to-end functionality for your development team, from planning releases and managing development backlog, to hosting source code in Git, to designing, building, testing, and deploying cloud-native applications to your Oracle Cloud Applications and Oracle Cloud instances.

For Former Developer Cloud Service Users

If you were a Developer Cloud Service user, the following table will help you understand the primary differences between Developer Cloud Service and VB Studio:

How Developer Cloud Service and VB Studio Differ?	Find out more:
You don't need to migrate your Developer Cloud Service projects. A VB Studio instance replaces your Developer Cloud Service instance, and you can continue to use your existing projects and corresponding DevCS features just as they are, without any impact to you.	*Using Oracle Developer Cloud Service* has been restructured and rewritten for VB Studio and is now called *Managing Your Development Process with Visual Builder Studio*. If you're an administrator, you'll want to check out *Administering Visual Builder Studio* as well.
VB Studio comes equipped with the Designer, a graphical user interface that enables you to develop web and mobile apps using components from the Oracle JavaScript Extension Toolkit (JET). To test these applications, or to release them for production, you must deploy the apps to a separate Visual Builder instance, which serves as the runtime environment. Of course, you can still use VB Studio to build apps with a third-party IDE or code editor and use VB Studio as the code repository, just as you did with DevCS. You can also use VB Studio to test, deploy, and maintain those apps throughout their lifecycles—nothing's changed there.	*Building Web and Mobile Applications* explains how to use the VB Studio Designer to build web and mobile apps.

How Developer Cloud Service and VB Studio Differ?	Find out more:
If you purchased Oracle Cloud Applications subscriptions that have front ends built with JET components, you can also use the VB Studio Designer to extend those apps to customize them for your business needs.	See *Extending Oracle Cloud Applications*.
Developer Cloud Service used tags to associate service instances with environments. In VB Studio, you'll need to add service instances again to environments, because the service instances associated with the environments were removed as part of the upgrade. The environments themselves were not removed, just the service instances associated with them.	For information about how to add a service instance to an environment, see *Manage an Environment*.

For Former Visual Builder Users

In VB Studio, you still use the Designer to create your visual applications, but the infrastructure surrounding that process has changed significantly, as described here:

How Visual Builder and VB Studio Differ?	Find out more:
In VB Studio, you and your team belong to an *organization*. Within that organization are *projects*, which help to organize the work for a given endeavor. A project contains a Git repository, where your source code is stored, along with build jobs that package up your app's artifacts and deploy them to the target environment. Each project also contains tools to help you manage your visual application's lifecycle, like an Agile board, issue tracker, team wikis, and more.	What Is Oracle Visual Builder Studio?

How Visual Builder and VB Studio Differ?	Find out more:
Whereas Visual Builder used to contain the runtime environment where you could test and deploy your visual applications, VB Studio requires you to have a separate Visual Builder instance to serve as your runtime environment, and to establish communication between the two services. VB Studio manages the runtime environment instances that serve as your development, test, and production environments in the Environments page. Within the Environments page, you can view the status of the various service instances that have been added to your environment.	If you're an administrator, see Set Up VB Studio for Developing Visual Applications to find out how to hook up your runtime to VB Studio. If you're an app developer, see Share, Publish, and Deploy Visual Applications.
Your work in the Designer now takes place in a *workspace*, which is an entirely private area within a project that only you can access. The workspace brings together everything you need to build your visual app: a private branch within the Git repository and a VB Studio environment that points to your Visual Builder runtime instance.	If you're an app developer, see Create Visual Applications in VB Studio.
If you want others to collaborate with you in developing your project's apps, your project owner will need to add them to the project and you'll need to commit your workspace to a branch in a Git repository that is shared with these project members. To facilitate collaboration, the Designer in VB Studio includes built-in support for Git with a Git menu in the toolbar that accesses the Git commands you're likely to use most frequently (Pull and Push, for example). There's also a new navigator tab (Git Panel) that provides a view to uncommitted changes in your workspace, and tools to resolve issues when your changes conflict with other changes in the Git repository branch that you want to commit to.	If you're a project owner, see Add and Manage Project Users. If you're an app developer, see Manage Your Visual Applications With Git.

How Visual Builder and VB Studio Differ?	Find out more:
In Visual Builder, the Stage and Publish actions were key parts of your development cycle. In VB Studio, however, you use **Share** to share your application with others for testing purposes, and **Publish** to push your changes from your local Git repository to the master branch of your remote repository (that is, the project's version) and deploy it to the Visual Builder runtime environment.	If you're an app developer, see Share a Visual Application and Manage Deployed Visual Applications.
For business objects, VB Studio maintains one database schema per workspace. As a best practice, we recommend that you use the same workspace and branch to create and edit business objects in a visual application.	See Work with Business Objects.
VB Studio provides the following options to manage your visual application's business object data: • Menu options to import and export data. You access these options from the Visual Applications tab for the deployed visual application in the Environments page • Build jobs to import and export business object data	See Manage Business Object Data During Development.
You can use the visual applications you built in Visual Builder within VB Studio by importing them, then performing a few post-import tasks.	See Learn About Migrating to Oracle Visual Builder Studio.

How Visual Builder and VB Studio Differ?	Find out more:
VB Studio manages connections to backend services differently to Visual Builder, where a Visual Builder administrator added these services to the Tenant Settings page. In VB Studio, the steps to create a connection depend on the backend service. If your visual applications need to access REST services from an Oracle Cloud Applications catalog, you add the Oracle Cloud Applications instance to the runtime environment. If the Visual Builder instance that you use in your environment is provided by Oracle Integration, visual applications in VB Studio inherit the catalog of Integration and Process backend services.	See Manage Backend Services in Your Visual Application.

How Visual Builder and VB Studio Differ?	Find out more:
The `grunt-vb-build` NPM package includes tasks to build visual applications that you develop in VB Studio and deploy to a Visual Builder runtime instance: • The `vb-process-local` task processes the sources of the visual application that you cloned from VB Studio's Git repository to your local Git repository for usage in the Visual Builder runtime instance. The `vb-process-local` task replaces variables and placeholders in `index.html`, downloads libraries from the Component Exchange, and so on. The archive that the `vb-process-local` task produces does not include absolute links to the Visual Builder runtime instance. • The `vb-credentials` task transfers the credentials (service connection information and mobile build configurations) from secure storage in VB Studio to the target Visual Builder runtime instance. • The `vb-deploy` task deploys the environment-independent artifact that the `vb-process-local` task produced to the target Visual Builder runtime instance and inserts environment-specific information, such as URLs and Oracle Identity Cloud Service information. The `vb-deploy` task also produces native mobile packages, if your visual application includes mobile applications.	If you want to use the Grunt tasks described here to build and deploy a visual application to a Visual Builder runtime instance, see Build and Deploy Your Application.

How Visual Builder and VB Studio Differ?	Find out more:
Although you'll now do almost all the administration tasks for your visual applications in VB Studio, someone with administrator privileges for the Visual Builder runtime needs to sign in to the Visual Builder runtime to do certain tasks. Examples include configuration changes to connect your Visual Builder runtime to an Oracle DB instance with more space, or to configure a custom domain if users access an application deployed on the Visual Builder runtime from a custom app URL.	If you're a Visual Builder runtime administrator, sign in to the Visual Builder runtime to complete the following tasks, that are described in *Administering Oracle Visual Builder Generation 2* . • Access Instance Settings • Configure Security Options for Applications • Set Page Messages for Access Denied Errors • Allow Other Domains Access to Services • Switch to Your Own Oracle DB Instance • Reset an Expired Password or ATP Wallet for Your Oracle DB Instance • Manage Self-signed Certificates • Configure Support for a Custom Domain

Extending Oracle Cloud Applications

If Oracle built your Oracle Cloud Application using Oracle JET, you can extend that app to customize it for your business needs. You can also create your own pages and page flows based on the Redwood theme, and deploy them alongside Oracle apps in your Oracle Cloud Applications instance.

To find out if you have such an app, see if you have an **Edit Page in Visual Builder Studio** option in your Oracle Cloud Application's edit menu. If you do, click it to jump over to VB Studio and start creating your extension. To help you along the way, have a look at What Do You Want to Do in VB Studio?

Like everything built in VB Studio, the source code for your extension is stored within a project's Git repository, and you work on your own branch of that repo in the context of your own private *workspace*.

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 Studio, 24.07.0
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