

New Features in Oracle Visual Builder

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

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 Oracle Visual Builder use a structure that isn't compatible with the Visual application structure now used in Oracle 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](#).

Topics:

- [Release 21.04 - February 2021](#)
- [Release 20.10 – November 2020](#)
- [Release 19.4.3 – June 2020](#)
- [Release 19.4.3 – March 2020](#)

Release 21.04 - February 2021

Some new Visual Builder features can't be used until you've upgraded your Visual Builder Runtime to 21.04. See [Features Requiring Visual Builder Runtime 21.04](#) for more information.

Change	Description
Service connection and backend enhancements	<ul style="list-style-type: none"> <li data-bbox="857 289 1458 583"> <p>• New navigation for service connections and backends</p> <p>The Services tab in the Navigator (previously the Service Connections tab) has been enhanced to show catalog backends as well. Within this tab, Service Connections now show under the Service Connections tab and backends show under the Backends tab. Previously, all backend settings were managed from the Services tab in the Settings editor. See <i>Work with Services</i>.</p> <li data-bbox="857 590 1458 919"> <p>• Support for custom backends</p> <p>In addition to the built-in Integration, Process, and Oracle Cloud Application backends, it's now possible to create backends that map to other types of custom servers. You can use any OpenAPI/ Swagger service specification or point to an Oracle ADF Describe to create a custom backend. See <i>Create a Custom Backend</i>.</p> <p>Service connections for custom backends can be created by service specification or by endpoint URL.</p> <li data-bbox="857 926 1458 1276"> <p>• New dynamic service connections</p> <p>You can now create a service connection to dynamically retrieve the service's OpenAPI definition, instead of copying the definition and storing it as part of your visual application's sources. A dynamic service connection creates a pointer to the service definition at a remote location. This keeps your application in sync with the latest service definition and enables you to re-use external definitions that aren't customized for your app. See <i>Service Connections: Static Versus Dynamic</i>.</p> <li data-bbox="857 1283 1458 1738"> <p>• Smart URL and information banners</p> <p>Several updates were made to enhance the workflow when you create a service connection by specification or by endpoint, key among them:</p> <ul style="list-style-type: none"> <li data-bbox="906 1402 1458 1486">– A new + Service Connection button enables you to create a service connection from an existing backend. <li data-bbox="906 1493 1458 1654">– The URL input field displays a drop-down list of existing backends and filters the list based on the text you enter. A new Detach button () lets you use the URL that the services resolves to, rather than the <code>vb-catalog</code> URL. <li data-bbox="906 1661 1458 1738">– An information banner helps you more easily identify service connections that are "derived" from a backend.

Change	Description
Code editor improvements	<p>The code editors in the Designer—HTML, JSON, JavaScript, and Code view in the Page Designer—are now based on Monaco, the same editor that provides extensive code-editing capabilities in Visual Studio Code.</p> <p>The HTML and JSON editors leverage this update as follows:</p> <ul style="list-style-type: none"> • The HTML editor provides code completion for Oracle JET snippets. For example, when you want to add a JET combo box, typing <code>o j c b</code> in the editor will present a list of component tags that match the text. You can then select the <code>o j c b o</code> tag in the code completion window to insert a combo box code snippet and add it to your HTML file. • The JSON editor provides insights based on the file's associated JSON schema to provide tooltips, hints, and key/value completion. <p>Note that code insight has changed—you now need to trigger it in an editor by typing <code>Ctrl+Space</code> or by typing a trigger character, such as the dot character (<code>.</code>) in JavaScript. See Work With Code Editors.</p>
Declarative support to create custom types from code	<p>It's now much easier to use your own type, such as a type class written in JavaScript or a typescript class, with a variable in Visual Builder. Using a new From Code option in the Types editor, you can import your type definition to declaratively plug in any Oracle JET type class or a custom type class and create an instance of that type class, then use it with a new category of variable known as an InstanceFactory variable. See Create a Custom Type From Code.</p>
New UI to manage resource imports	<p>It is now possible for you to add, update, or delete imported resources, such as custom CSS files, modules, and components. You can create references to these imports at the page, flow, and application level using the new Imports tab from the Settings editor. See Manage Custom Components, CSS, and Module Imports.</p>
Improvements to the Action Chain editor	<p>When you define an action's properties in an action chain, its default ID is now regenerated to provide a more descriptive identifier. For example, a single Call REST Endpoint action added to a chain has an initial ID of <code>callRest</code>. If you configure the actions endpoint, say, to call the Petstore <code>getPetById</code> endpoint, the action ID is automatically updated to <code>callRestGetPetById</code>, making your code more readable and easier to maintain and debug.</p> <p>IDs are regenerated for the following actions: Call Action Chain, Call Function, Call REST, Fire Event, Navigate, and Call Component.</p>

Change	Description
Index a business object field	You can now index a business object field to add a non-unique index to the field's database column and improve performance when you search for the field's value via REST requests or Groovy code. See Index a Field .
Business object relationship	When your business object includes a reference type field, you can now view and edit the relationship directly from the referenced field's properties.
Improvements to the Variables and Types editors	<ul style="list-style-type: none"> • Create a variable from the Types editor You can now use a shortcut to create a variable for a specific type: select a type in the Types tab, right-click, and select Create a variable. • Keep track of variable and type usages in the Variables and Types editors You can now view variable and type usage information under the Usages section in the Properties pane. You can also click a usage to navigate there easily.
Enhanced support for JS functions	It is now easier to call custom functions defined in JavaScript modules and imported module objects. These functions become available for selection in an action chain using the Call Function action and in a component's property (both in the Expression editor and the Variables picker). See Work with the JavaScript Editor .
Key usability improvements	<ul style="list-style-type: none"> • Auto setting for screen size The screen size setting that determines how your canvas displays in the Page Designer toolbar now includes an Auto option, which resizes the canvas to take up all available space between the left and right panes. • Revamped Visual Applications page We've made some changes to the Visual Applications Home page. With one glance at the new Origin column, you can see which apps were built in your Visual Builder instance and which originated in Visual Builder Studio. And while the only action available for VB Studio apps on the Home page is Delete, you still have access to all the other actions—you just perform them in VB Studio now. See Manage Applications Created in Visual Builder Studio. Finally, check out the new icons on the Home page that indicate an application's status, as well as the new timestamp that shows recent activity for the app.
Recovery mode	When a visual application fails to upgrade because of syntax errors, the Designer now goes into recovery mode. In this mode, you can use tools such as Code View to fix syntax errors and then upgrade your visual application. See Resolve Issues that Prevent Upgrade of Visual Application .

Change	Description
Sitemap for a web application	You can now add a sitemap to a web application's resources to provide search engines information about your application's pages for intelligent crawling and search indexing. See Add a Sitemap to a Web Application's Resources .
New camera component	You can now use the new camera component when you want your application to access the camera capabilities of the devices on which it is installed. The camera component offers more configuration options than the Take Photo action, and does not require you to add a separate action to trigger taking a photo. See Add Camera Component to a Page .

Features Requiring Visual Builder Runtime 21.04

This release of Visual Builder uses Oracle JET 9.2 libraries and components. We recommend that you upgrade your Visual Builder applications to this latest JET version, as well as to the 21.04 Visual Builder Runtime, to take advantage of the full spectrum of 21.04 features. For example, in JET 9.2, new slots (Action, Navigation, and Quarternary) have been added to the [List Item Layout component](#), making it even easier to produce great-looking content for your ListViews. To see everything that's new in JET 9.2, see the [Release Notes](#).

Here are the features that require the 21.04 VB Runtime:

Feature	Description
New dynamic service connections	You can now create a service connection to dynamically retrieve the service's OpenAPI definition, instead of copying the definition and storing it as part of your visual application's sources. A dynamic service connection creates a pointer to the service definition at a remote location. This keeps your application in sync with the latest service definition and enables you to re-use external definitions that aren't customized for your app. See Service Connections: Static Versus Dynamic .
Declarative support to create custom types from code	It's now much easier to use your own type, such as a type class written in JavaScript or a typescript class, with a variable in Visual Builder. Using a new From Code option in the Types editor, you can import your type definition to declaratively plug in any Oracle JET type class or a custom type class and create an instance of that type class, then use it with a new category of variable known as an InstanceFactory variable. See Create a Custom Type From Code .

Release 20.10 – November 2020

Change	Description
Oracle Redwood Design Language	Web and mobile apps that you create using this release of Visual Builder now use Redwood, a theme created with the Redwood design language, the new Oracle standard for application look and feel. See Develop Applications .
Manage runtime dependencies	Your applications are no longer automatically upgraded to the new major versions of Visual Builder Runtime and Oracle JET after your Visual Builder instance is upgraded. You decide when to upgrade your applications from the application's Settings editor. See Manage Runtime Dependencies for Visual Applications .
Audits	<ul style="list-style-type: none"> Status indicators Red overlay icons now appear in the Navigator to identify app artifacts that include audit errors. A red underline appears on the Navigator entry and the tab for the file that includes the error. Errors are generated for broken variable and type references. Warnings are generated for unused action chains, constants, events, event listeners, types, and variables. For action chains, audits have been added to validate that required fields in the action include values. Oracle JET Audit Framework The Audits feature now references up the Oracle JET Audit Framework (JAF) tool and metadata from Oracle's content distribution network (CDN). You can configure the built-in rules that JAF provides. See Audit Application Code.
Horizontal text tabs for artifacts in the Designer	The artifact section tabs for page flows, event listeners, and so on now appear as horizontal text tabs above the artifact instead of as a vertical icon bar. See Understand the Designer .
Business object data caching	You can now define a caching strategy to safely store your business object's data and improve performance, by editing the Resource Cache Control setting on a business object's Endpoints tab. Because all application data is deemed sensitive, by default, no data is cached. See Control Data Caching for Business Objects .
Create variables	You can now create variables from within the Assign Variables dialog that you open from the Action Chains editor. See Add an Assign Variables Action .

Change	Description
Mobile applications	<ul style="list-style-type: none"> Deep links for mobile applications The Visual Builder Runtime now supports deep linking. Application behavior depends on the app and the environment where the app runs. Android and iOS mobile apps that you build in Visual Builder can be opened from deep links. For PWAs, iOS does not support deep links while Android provides ready-to-use support for deep links. See Support Deep Linking from Mobile Applications. Adaptive icons for Android mobile applications Adaptive icons that display as a variety of shapes on different Android devices are now supported for mobile applications built on Visual Builder. The sample application image archive (available in an application's Resources section) includes adaptive icons that you can use as a base when you create custom images for your application. If your application uses an older image archive, Visual Builder will try to use those icons as adaptive icons, but it is best to provide your own icons that are in line with Android specifications. Visual Builder does not validate your icons and cannot guarantee that they will be compatible. See Change the Splash Screen and Icons Used by a Mobile Application and Enable PWA Support.
Action chain tests	The <code>grunt-vb-build</code> NPM package now includes a <code>vb-test</code> Grunt task that runs the action chain tests in your visual application on your computer. See Test Action Chains Using the <code>vb-test</code> Grunt Task.
Upgrade the Oracle Sample R13 SaaS LightBlue Theme	If your application uses the Oracle SaaS R13 Light Theme, you need to upgrade the theme in your application before you run the application using this release. See Update Your Oracle SaaS Application Template Theme.

Release 19.4.3 – June 2020


Change	Description
Reload Data from Application Sources	For business objects that contain application setup data, the Data tab for Business Objects includes a new menu icon that updates your development database schema to reflect the content of the current version of the <code>entity-data.csv</code> file. See Reload Data from Application Sources.

Release 19.4.3 – March 2020

Change	Description
OpenAPI 3	<p>Visual Builder now supports the use of REST services described by the OpenAPI 3 specification.</p> <p>When you open an existing visual application in this release or import a ZIP containing a visual application, Visual Builder upgrades the pre-existing <code>service.json</code> file (Swagger v2 format) to an <code>openapi3.json</code> file that uses the OpenAPI 3 format. If this operation fails because, for example, the <code>service.json</code> file is invalid, you will need to edit the <code>service.json</code> file so that it is valid and Visual Builder can successfully upgrade to the OpenAPI 3 format in the <code>openapi3.json</code> file.</p> <p>In addition, all <code>*-flow.json</code> files in web and mobile apps will have references to <code>services/*/service.json</code> in the services map upgraded to point to the new <code>openapi3.json</code> file.</p> <p>Visual Builder continues to support the use of REST services that are described by JSON files using the Swagger v2 specification.</p>
Application Profiles	<p>Use application profiles to specify different application configurations for different environments and deployments. You can, for example, use an application profile to specify a service connection to different REST instances (development, test, and production) for each lifecycle phase of application development.</p>
Connection Type(s) for CORS	<p>Connection type is a new field where you control how your service connections communicate with external REST services depending on whether these services support CORS or not. Visual Builder automatically migrates service connections in existing applications to the appropriate connection type. The Direct (Bypass Proxy) authentication mechanism no longer appears and, in this release, the equivalent configuration is an authentication type of None and a connection type of Dynamic, Service supports CORS. See Use an Appropriate Connection Type to Handle CORS for REST Services.</p>
Oracle Cloud Infrastructure API Signature 1.0	<p>You can now use a signature to create an AppID flow using a single Oracle Cloud Infrastructure (OCI) user to natively connect to OCI endpoints. See Fixed Credentials Authentication Mechanisms.</p>
Action Chain Tests	<p>Visual Builder now provides test automation capabilities for action chains, helping you to adopt test driven development. A new declarative interface helps you to define tests for the action chains in your web and mobile applications that you can run individually or simultaneously.</p>

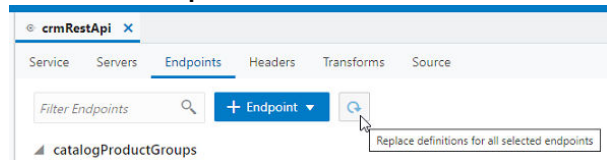
Change	Description
New Array Data Provider	The page model provides a new built-in type, <code>vb/ArrayDataProvider2</code> , which new applications should use. The legacy <code>vb/ArrayDataProvider</code> type is supported in existing applications. <code>ArrayDataProvider2</code> does not allow writes to individual properties of <code>ArrayDataProvider2.data</code> , unlike the legacy <code>ArrayDataProvider</code> . Instead, <code>ArrayDataProvider2</code> supports using either the <code>fireDataProviderEventAction</code> or the <code>assignVariablesAction</code> to mutate data, while the legacy <code>ArrayDataProvider</code> supports only the <code>assignVariablesAction</code> .
Custom JET and Runtime Versions for Mobile Applications	You can now specify custom JET and runtime versions for mobile applications where previously you could only do this for web and progressive web apps.
Favicons for Web Applications	Oracle Visual Builder now provides two default favicons for use in web applications and Progressive Web Apps. One favicon is for use in light mode and the other is for use in dark mode. Overwrite the default favicons if you want to use your own favicons.
Mobile Build Configurations	The mobile build configurations that you define for Android and iOS must be assigned to an application profile. The check boxes that you previously used to specify a default build configuration for publish or stage operations have been removed.
Business Processes	Application profiles can be used to manage the connection to the Process Servers that your visual applications use.
Open URL Action for Native Mobile Applications	The existing Open URL action has been updated to support opening local file attachments on native mobile applications.
<code>\$application.deployment</code>	The <code>\$application.deployment</code> built-in variable has been added to facilitate code sharing between web, mobile, and progressive web applications developed using Visual Builder.
Create File Menu Action	A Create File menu action is now available on folders in the source navigator tree to allow you to create custom files and subfolders almost anywhere in your app. The following are the exceptions where Visual Builder does not show the Create File menu action on a folder: <ul style="list-style-type: none"> Some folders are special and do not allow for the creation of singular files: <ul style="list-style-type: none"> Root folders for web and mobile apps Any folder in the hierarchy with the name <i>flows</i> or <i>components</i> Some folders already have a Create action that creates singular files, in which case adding a Create File action would be superfluous: <ul style="list-style-type: none"> <code>resources/js</code> <code>resources/css</code>

Change	Description
Create JS and CSS Files	You can now more easily create JS and CSS files by using the Create JS File and Create CSS File dialogs that you invoke from the + icon that appears beside the entries for these artifacts in the Navigator.
New vbDataProviderNotification Event Listener	You can register an event listener for vbDataProviderNotification code events to display any errors from the Service Data Provider.
Improvements to the Events Editor	<p>The following improvements were made to the Events editor:</p> <ol style="list-style-type: none"> 1. Event Payloads are shown with full details in the Mapper. If there is no payload for an event it is not shown. 2. When creating a new listener for Events, new action chains are populated with input parameters matching the event's payload and are also mapped automatically. 3. The default action chain created for vbBeforeEnter and vbBeforeExit listeners returns a payload with cancel set to false, plus a description describing how to cancel this action.
Secure Storage	Sensitive data such as passwords and certificates are no longer stored in areas of storage excluded from versioning and export (private storage). Instead, they are stored in the new secure storage of Visual Builder, which is a repository of sensitive pieces of data keyed by a unique key that is stored in the source. This makes it possible to securely transfer sensitive data between Visual Builder instances. Source files, such as mobile build configuration files, now contain references to the secure storage rather than private storage. Visual Builder updates all existing applications to use secure storage.
Reset an Expired Password or ATP Wallet for Your Oracle DB Instance	Visual Builder administrators can now reset an expired password or an ATP wallet for the Oracle DB instances that you use to replace the database provisioned with your Visual Builder instance. See Reset an Expired Password or ATP Wallet for Your Oracle DB Instance .

Change	Description
Business Object REST Endpoints	<p>You can now add or remove the endpoints that the business objects in your visual application expose. Using a new business object resource editor, you can configure the business object to include only the endpoints that you require, thereby reducing the size of the metadata file that describes your business object REST endpoints.</p>
	<div style="border-left: 2px solid #0070C0; border-right: 2px solid #0070C0; border-bottom: 2px solid #0070C0; padding: 10px;"> <p> Note:</p> <p>For existing applications, especially those that contain many business objects, we strongly recommend that you trim the exposed endpoints of each business object to include only those that you require. You can apply the default setting to expose only the first level of endpoints for each object, but if deeper nested endpoints were included in the object's resource definition, you must modify the default selection to include those endpoints.</p> </div>
Business Object Data Manager	<p>The Data tab now includes menu buttons that allow you to duplicate data rows and to filter the fields that display in the data table.</p>
Business Object Diagram	<p>Business object diagrams now show object accessor field names by default in a separate field of the business object node. You can disable the default behaviour using the Fields and Show Object Accessors menu entries that you access from the menu for the business object diagram. Also, you can now save business object diagrams to your computer as SVG or PNG graphic files.</p>

Change	Description
Visual Builder Grunt Tasks	<ul style="list-style-type: none"> <li data-bbox="857 289 1446 401">• A new task, <code>vb-package</code>, can be used to package visual application sources. It can also perform application optimization (<code>vb-optimize</code>) and generate a build manifest (<code>vb-manifest</code>). <li data-bbox="857 411 1446 548">• The <code>vb-manifest</code> task now includes two new options. The <code>xx-version</code> option allows you to set an alternative version value for the visual extension manifest, and the <code>git-repository-url</code> option specifies the URL for the Git repository. <li data-bbox="857 558 1446 674">• The <code>vb-build</code> task now includes two options, <code>cdnURL</code> and <code>insertBaseURL</code>, that facilitate the hosting of application assets on a Content Delivery Network (CDN).
Internet Explorer 11	<p data-bbox="857 695 1406 884">Visual Builder runtime has deprecated the use of Internet Explorer 11. Users will now receive a deprecation warning if accessing a Visual Builder application from Internet Explorer. In a subsequent release of Visual Builder in the second half of 2020, Visual Builder runtime will discontinue support of Internet Explorer 11.</p>
Upgrade the Oracle Sample R13 SaaS LightBlue Theme	<p data-bbox="857 905 1430 1041">If your application uses the Oracle SaaS R13 Light Theme, you need to upgrade the theme in your application before you run the application using this release. For more details and instructions on how to perform the upgrade of the theme, read this blog post.</p>

Change	Description
Lists of Values Endpoints for Oracle Cloud Applications	<p>This is not a new feature, but be aware that Oracle Cloud Applications (OCA) has changed the way that it manages lists of values endpoints. The service connections that you created in visual applications prior to this release might use an older version of the definition for lists of values endpoints from OCA. This does not create problems for existing applications, but we advise you to use the Replace definitions for all selected endpoints button on the service connections in your visual applications that use these types of endpoints to refresh all definitions. Clicking the Replace definitions for all selected endpoints button marks an older version of an endpoint as obsolete, but does not remove it from your apps as a web or mobile app might reference this endpoint in some screens. In Visual Builder's Endpoints tab, a strike through appears for an endpoint that has been marked as obsolete. For best performance and to use the latest way of surfacing the endpoints for lists of values, we recommend that you manually replace the obsolete endpoints in your web and mobile apps to use the newer definition for lists of values endpoints from OCA.</p> <p>The following image shows the Replace definitions for all selected endpoints button:</p>



New Features in Oracle Visual Builder Add-in for Excel

The Oracle Visual Builder Add-in for Excel version bundled in Visual Builder 21.04 is 2.4. For details of what's included in this release, see [New and Changed Features](#).

Supported Browsers

Oracle Visual Builder supports most modern HTML5-compliant browsers.

Visual Builder complies with the [Oracle Software Web Browser Support Policy](#) and supports the latest version of the browser available, and in the case of IE and Safari, one previous major release. Support is provided by Oracle on all platforms that the browser vendor provides support for. For mobile device operating systems, Oracle

provides support for the most recent browser delivered by the device operating system only.

The following table describes the platforms supported by the Visual Builder runtime.

Operating System	Chrome	Firefox	Microsoft Browser	Safari
Android	Supported*	Not Supported	N/A	N/A
iOS	Not Supported	Not Supported	N/A	Supported
Mac OS X	Supported	Supported	N/A	Supported
Windows	Supported	Supported	Supported	Not Supported

* Chrome for Android only, not native Android browser

JavaScript must be enabled for all browsers.

 **Note:**

The Visual Builder design-time UI for building applications supports the Chrome browser running on Mac OS X and Windows. Other browsers and platforms are not supported.

 **Note:**

Visual Builder runtime has deprecated the use of Internet Explorer 11. Users who try to access a staged or published Visual Builder application from Internet Explorer will now see a deprecation warning. In addition, Oracle Support will no longer address issues pertaining to Internet Explorer 11.

Deprecated Features

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

Feature	Description	Release
Internet Explorer 11	Visual Builder runtime has deprecated the use of Internet Explorer 11. Users who try to access a deployed Visual Builder application from Internet Explorer will now see a deprecation warning.	19.4.3 - August 2020
	Oracle Support will no longer address issues pertaining to Internet Explorer 11.	21.04 - February 2021

Upgrade Policy

We strongly suggest that you upgrade and republish your apps from time to time, not only to take advantage of the new features, bug fixes, and performance enhancements that come with each new release, but also to reduce the risk of possible incompatibilities between the Visual Builder Runtime and JET libraries you built your app with in the Designer, and the Visual Builder instance to which you deployed your app in Oracle Cloud. What does this mean? Suppose you built and deployed your app using Visual Builder 18.4.1. Since then, Visual Builder has upgraded its target deployment environment several times—from 18.4.1 to 18.4.5 to 19.1.3 and so on—and your app has continued to run on those instances with no issues. However, when the 19.4.3 instance becomes available (for example), your app suddenly stumbles on an incompatibility between your 18.4.1 runtime dependencies and your 19.4.3 deployment environment—simply too much has changed between the time you built the app and the capabilities in the latest target deployment instance. To avoid this, it's a good idea to upgrade and re-publish your apps as frequently as your schedule allows. This entails opening your app in the Designer to uptake a new Runtime Version/JET library (and, optionally, taking advantage of some of the latest features), testing it with the latest Visual Builder deployment target, then republishing your app to that instance.

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Oracle® Cloud What's New in Oracle Visual Builder,
F38873-02

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