



SAP Business Application Studio

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SAP Business Application Studio | Cloud

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What Is SAP Business Application Studio?

SAP Business Application Studio is a new SAP Business Technology Platform (SAP BTP) service that offers a modern development environment tailored for efficient development of business applications for the SAP Intelligent Enterprise.

SAP Business Application Studio is based on Code-OSS, an open source used for building Visual Studio Code. Available as a cloud service, SAP Business Application Studio provides a desktop-like experience similar to leading IDEs, with command line and optimized editors. At the heart of SAP Business Application Studio are the dev spaces. The dev spaces are comparable to isolated virtual machines in the cloud containing tailored tools and preinstalled runtimes per business scenario, such as SAP Fiori, SAP S/4HANA extensions, Workflow, Mobile and more. This simplifies and saves time in setting up your development environment and allows you to efficiently develop, test, build, and run your solution locally or in the cloud.

→ Tip

The English version of this guide is open for contributions and feedback using GitHub. This allows you to get in contact with responsible authors of SAP Help Portal pages and the development team to discuss documentation-related issues. To contribute to this guide, or to provide feedback, choose the corresponding option on SAP Help Portal:

- Edit: Contribute to a documentation page. This option opens a pull request on GitHub.
- Feedback: Provide feedback about a documentation page. This option opens an issue on GitHub.

You need a GitHub account to use these options. For more information, [introduction video](#) .

Scenarios

SAP Business Application Studio provides a tailor-made development environment for various development scenarios, such as SAP Fiori, SAP S/4HANA extension, and Workflow. With each of these scenarios, you can create different types of applications.

In the [Dev Space Types](#) section, you can learn about each scenario.

Capabilities

In SAP Business Application Studio, you are provided with one or more dev spaces. A dev space is a development environment with all the tools, capabilities, and resources needed for developing your application. Each type of application requires a different development environment. Based on the type of application that you choose to build, you're provided with a different set of tools. You can add additional tools to supplement the application with additional extensions for the scenario.

The dev space is an isolated development environment providing a local-like development experience. Among other tools, it provides terminal access to the file system so that you can run various commands. You can test-run your application in the dev space itself without deploying to the target runtime (Cloud Foundry), almost as if you were working on your own desktop.

Unlike other desktop IDEs, SAP Business Application Studio is equipped with various tools specially built for developing business applications in the SAP ecosystem.

These tools cover the end-to-end development cycle:

- Clone an existing project with a Git client or create a new project using templates.
- Use editors for SAP-specific technologies.
- Easily test your application on your dev space while consuming services from remote sources.
- Build and deploy the application as a multitarget application (MTA).

Availability

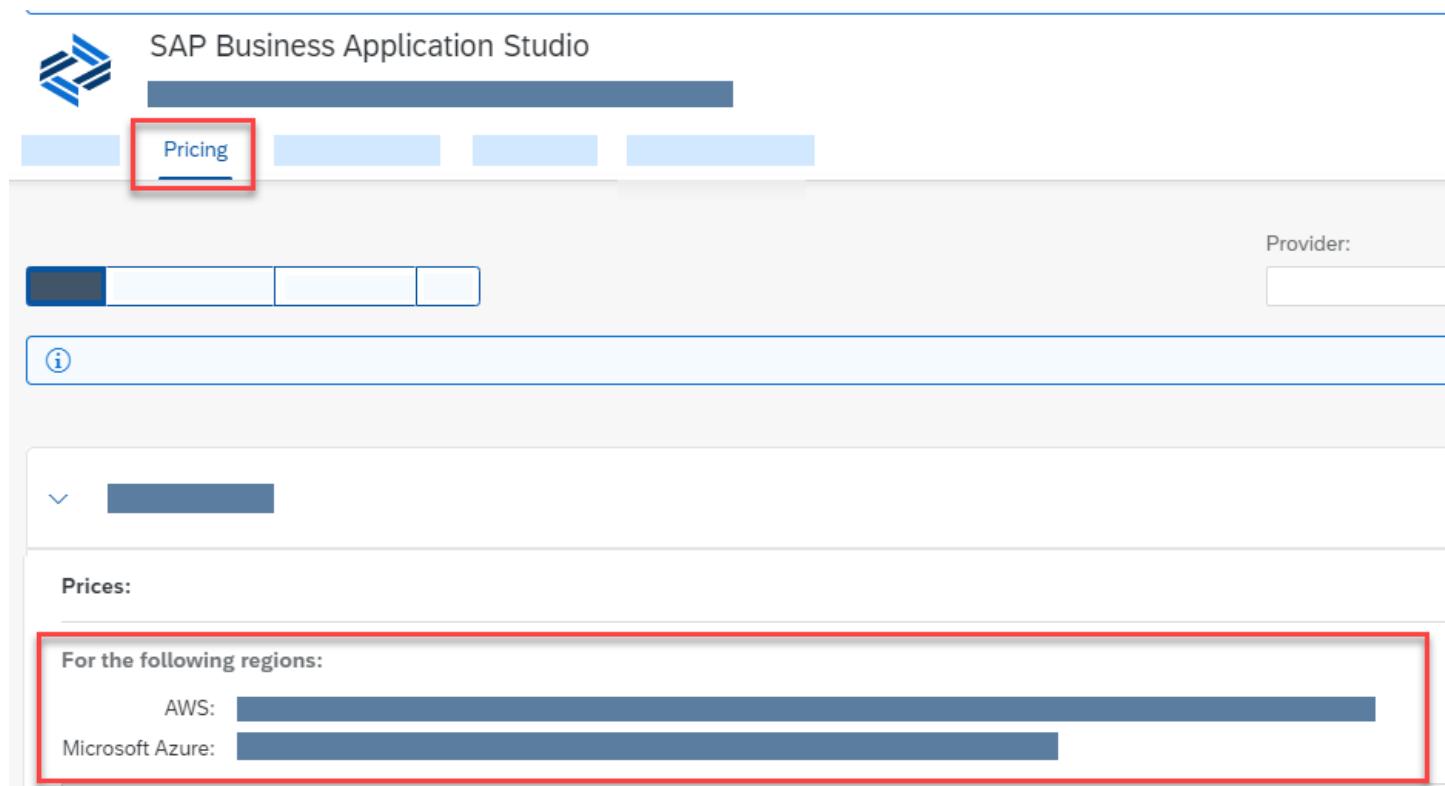
The following browsers are supported for working in SAP Business Application Studio. Additional browsers will be added over time.

i Note

Unless specifically stated, only the latest browser version is supported.

- Mozilla Firefox
- Google Chrome
- Microsoft Edge

You can find the regions where SAP Business Application Studio is available in the **Pricing** tab of the [SAP Discovery Center](#).



The screenshot shows the SAP Discovery Center interface. At the top, there's a logo and the text "SAP Business Application Studio". Below it, a navigation bar has several tabs, with "Pricing" being the active one and highlighted with a red box. The main content area displays information about the service, including a "Provider:" field with a dropdown menu. There's also a small info icon (i) in a blue box. A section titled "Prices:" contains a table for "For the following regions:". This table includes rows for "AWS:" and "Microsoft Azure:", each with a progress bar indicating availability. The entire "Prices:" section is also highlighted with a red box.

What's New for SAP Business Application Studio

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Development Experience	<p>You can now enable the Headless Testing Framework extension for your dev space.</p> <p>This extension allows you to run cross-platform end-to-end tests on a UI5 application, with selectors compatible to OPA5.</p> <p>See Using BAS with wdi5.</p>	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Storyboard	<p>In the storyboard, you can now create data models and service entities from the column headers or from the toolbar.</p> <p>In the settings, you can define if you want them created in the default namespace or service or to select the location manually.</p>	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	<p>In the Service Center, you can now search for a service within a package from the SAP API Business Hub, the API business hub enterprise, or the Unified Customer Landscape service provider. See SAP API Business Hub Service Provider.</p>	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	You can now edit the data source for an SAP System service from the Storyboard. See Storyboard and Project Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	<p>In the SAP HANA Native Application extension for SAP Business Application Studio, you can now use the SAP HANA Project Explorer to include trace information in the deployment log displayed in the terminal pane. See User Preferences for SAP HANA Native Application Development Tools.</p>	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	<p>In the SAP HANA Native Application extension for SAP Business Application Studio, you can now use the Database Explorer's SQL console as a custom editor. See Use the SQL Console for SAP HANA to Query the Database.</p>	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	<p>In the SAP HANA Native Application extension for SAP Business Application Studio, you can now use the Project Explorer to provide support for SAP Cloud Application Programming (CAP) projects and access to tools that help you to maintain native SAP HANA database artifacts. See Working with the SAP Cloud Application Programming Model.</p>	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension for SAP Business Application Studio, you can now display syntax suggestions and dependency information in a side panel in the Database Explorer's SQL console. See Use the SQL Console for SAP HANA to Query the Database .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	CAP	You can no longer use SAP Business Application Studio run configurations to create and run CAP Java applications based on the classic Java stack. (The CAP classic Java stack was deprecated in 2021.) To continue using SAP Business Application Studio run configurations for CAP Java applications, migrate to the new CAP Java stack. See Java Migration Towards the new CAP Java SDK .	Info only	General Availability	Changed	Technology
SAP Business Application Studio	Cloud Foundry	Java	SAP Business Application Studio now supports JAVA 17. You can select this version from the command palette. Open the command palette and select JAVA Set Default JDK .	Info only	General Availability	Changed	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	You can now open a diagram to see the service entities, their properties, and the relationships between the entities from the Service Center. See SAP System Service Provider .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Git	You can now use the Simplified Git view to perform Git operations and manage Git repositories in SAP Business Application Studio. See Using the Simplified Git View .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Development with Productivity Tools	In the Full-Stack Application Using Productivity Tools dev space, a run configuration is automatically generated when you add an external data model to a service from the SAP System service provider. See Add an External Data Model .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Development with Productivity Tools	In the Full-Stack Application Using Productivity Tools dev space, a run configuration is automatically generated when you add an external data model to a service from the SAP API Business Hub or the API business hub enterprise. See Add an External Data Model .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Extension Project	You can now migrate and extend existing SAPUI5 applications that reside in the SAPUI5 ABAP repository. See Extend SAPUI5 Applications .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Adaptation Project	With Adaptation Project, you can now create manifest app descriptor changes using a wizard. The possible types of changes are - Replace OData Service, Add Annotation file, Add OData Service and SAPUI5 Model, and Add Component usage. See Adding App Descriptor Changes .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	The Service Center now includes the following additions that make it easier to get started: <ul style="list-style-type: none"> The HELP section provides an overview of the Service Center and links to detailed documentation for each service provider. The SAP System service provider includes a button to add a system for the first time. See SAP System Service Provider. 	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	Apply filters to both partners of a join. Filters that are applied to one join partner can also be applied to mapped columns of the other join partner. See Map Filters Between Join Partners .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Calculation Views	<p>The following new options are available for snapshots in a calculation view:</p> <ul style="list-style-type: none"> • Create Snapshot After Deployment Automatically • Keep Snapshot During Redeployment • Mode of Generated Procedure <p>See Create Snapshots.</p>	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	The calculation view editor now lets you undo and redo operations on calculation views. See Undo and Redo Modeling Operations .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension for SAP Business Application Studio, the SAP HANA projects explorer now provides direct access to online help for the specific database artifact type that you are creating. See Add Database Artifacts to your SAP HANA Cloud Database Application .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension for SAP Business Application Studio, you can now use the SAP HANA Project Explorer to recover design-time artifacts by binding to a user-provided service. See Restore Design-time Artifacts from the Database .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension for SAP Business Application Studio, the SAP HANA Project Explorer now supports the multitarget resource type <code>org.cloudfoundry.managed-service</code> . See Configure an SAP CAP Application to Work with Native SAP HANA Artifacts .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension for SAP Business Application Studio, the SAP HANA Project Explorer now enables you to set (in user preferences) the automatic configuration of the "development mode" feature when deploying migration tables. See User Preferences for SAP HANA Native Application Development Tools and Migration Tables (SAP HANA Cloud HDI Reference) .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Development Experience	You can now configure and run continuous integration and delivery (CI/CD) pipelines that automatically build, test, and deploy your code changes to speed up your development and delivery cycles. See Continuous Integration and Delivery .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	You can now add an SAP Cloud for Customer system to your SAP Business Application Studio subaccount from the Service Center. See SAP System Service Provider .		General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	The Unified Customer Landscape service provider is now integrated in the Service Center. You can use the services from registered SAP S/4HANA Cloud systems as data sources in your application or for application development. See Unified Customer Landscape Service Provider .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Development Experience	SAP Business Application Studio now uses Code-OSS, the open source used for building Visual Studio Code. This change comes with many user experience improvements that will speed up your productivity. All business functionality is still available. Some basic IDE capabilities have been updated. Once you are used to the new UI, your development experience will be better and faster.	Info only	General Availability	Announcement	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Dev Space Manager	<p>You can now provide feedback regarding your development experience in SAP Business Application Studio by taking our survey.</p> <p>You can access the survey from the menu bar in the Dev Space Manager.</p>	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	You can now add temporal information (system time and application time) to the definition of a calculation view. See Add System Time and Application Time .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	You can now apply greedy join pruning to join executions. This can improve the performance of queries in situations in which joins are not required for data correctness. See Configure Greedy Join Pruning .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	Window Functions have been enhanced. See Create Window Function Nodes .	Info only	General Availability	Changed	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, you can now use the standard database-artifact creation wizard to add a virtual table to your database application. See Create Virtual Tables .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, it is now possible to use the Database Explorer's SQL console to select local or SAP HANA database connections. See Use the SQL Console for SAP HANA to Query the Database .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the Database Explorer's SQL console now provides new context menu items that enable you to open SQL files and display the contents directly in the SQL console itself. See Use the SQL Console for SAP HANA to Query the Database .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, new context-menu items in the Database Explorer enable you to generate a SELECT or CALL statement for supported database artifacts. See View Database Objects with the Database Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, it is now possible to view the data of supported artifacts in the Database Explorer's SQL console. See View Database Objects with the Database Explorer and Use the SQL Console for SAP HANA to Query the Database .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application, the Project Explorer now enables you to bind a database module to a user-provided service. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the Project Explorer now displays a warning if services bound to a database modules do not match the current Cloud Foundry space. Users can choose to automatically unbind these services by setting a user preference. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer and User Preferences for SAP HANA Native Application Development Tools .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the Project Explorer now displays a warning if services bound to a database modules do not match the database ID defined in the mta.yaml file. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, you can now use the Project Explorer to recover design-time artifacts in your workspace from the deployed artifacts in an HDI container. See Restore Design-time Artifacts from the Database .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, you can now use the Project Explorer to synchronize the deployment state of a database module with the deployment state from the database. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, you can now use the Project Explorer to create a procedure grantor when adding a new database connection. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Guided Answers	You can now open the Guided Answers from the command palette to troubleshoot SAP Business Application Studio.	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Development with Productivity Tools	In Low-Code-Based Full-Stack Cloud Application dev spaces, you can now configure and run continuous integration and delivery (CI/CD) pipelines that automatically build, test, and deploy your code changes to speed up your development and delivery cycles. See Continuous Integration and Delivery .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Development with Productivity Tools	In Low-Code-Based Full-Stack Cloud Application dev spaces, you can now use the Get started with SAP Business Application Studio booster to set up your subaccount for developing low-code business applications. See Initial Setup .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Development with Productivity Tools	In Low-Code-Based Full-Stack Cloud Application dev spaces, you can now extend an existing service or create an SAP S/4HANA service with additional fields with guided steps from the Guided Development tool. See Creating an SAP S/4HANA Application .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Development with Productivity Tools	In Low-Code-Based Full-Stack Cloud Application dev spaces, you can now extend an existing service or create an SAP S/4HANA service with additional fields with guided steps from the Guided Development tool. See Creating an SAP S/4HANA Application .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Node.js Version	The Node.js version for Theia was updated to Node.js 16.15.0.	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	The API business hub enterprise service provider is now integrated in the Service Center. You can explore OData-based services from the API Business Hub Enterprise. See API Business Hub Enterprise Service Provider .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	You can now create snapshots based on a specific query in a calculation view. See Create Query Snapshots .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	A new aggregation option MEDIAN is available for: <ul style="list-style-type: none"> • Measures in a calculation view with aggregation or star join • Calculated columns with measure type, if client side aggregation is enabled • Mapping for a node, if the column is a measure See Supported View Nodes for Modeling Calculation Views .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Calculation Views	You can now map session variables to input parameters. Up to now, it was only possible to map parameters and variables to input parameters. See Supported View Nodes for Modeling Calculation Views .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	You can now quickly find out where elements in a calculation view, such as calculated columns, input parameters, restricted columns, or variables, are used. See Where Used Functionality .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	You can now use the SAP HANA Native Application extension to export a package that includes selected objects from an SAP HANA HDI container, for example, if required for testing by support teams. See Export an SAP HDI Container for Support Purposes .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	You can now create a default "hdbgrants" file for the automatic assignment of privileges when adding a new database connection in the SAP HANA Projects explorer in the SAP HANA Native Application extension. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, you can now set the user preference "auto-commit" in the SAP HANA SQL Console to ensure that any changes to the database required by the code you run in the SQL Console are performed immediately, for example, when inserting or updating data in tables. See Use the SQL Console for SAP HANA to Query the Database .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	You can now use the SAP HANA SQL Console in the SAP HANA Native Application extension for SAP Business Application to run SQL queries that include parameters. See Use the SQL Console for SAP HANA to Query the Database .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	The SAP HANA Projects explorer in the SAP HANA Native Application extension now checks the details of the target schema when binding to an existing service. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	You can now switch between database connections in the SAP HANA SQL Console in the SAP HANA Native Application extension for SAP Business Application. See Use the SQL Console for SAP HANA to Query the Database .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	You can now use context-sensitive menus in the SAP HANA Databases explorer's Catalog Browser in the SAP HANA Native Application extension to copy the simple or fully qualified name of a database object to the clipboard. See View Database Objects with the Database Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	You can now use the SAP HANA Databases explorer's Catalog Browser in the SAP HANA Native Application extension to generate the SQL code that was used to create the selected database object. See View Database Objects with the Database Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	You can now use the SAP HANA Projects explorer in the SAP HANA Native Application extension to bind a user-provided service to a target HDI container. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	You can now use the SAP HANA Projects explorer in the SAP HANA Native Application extension to bind to (or unbind from) all services displayed in the Database Connections pane. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer and View Database Objects with the Database Explorer .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Service Center	You can now preview the entity data of an SAP API Business Hub service before application creation from the Service Center. See SAP API Business Hub Service Provider .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	You can now search for a service in an ABAP service catalog from the Service Center. See SAP System Service Provider .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Service Center	You can now preview the entity data of a SAP System service before application creation from the Service Center. See SAP System Service Provider .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Dev Space Manager	You can now select the Low-Code-Based Full-Stack Cloud Application dev space type to easily develop, test, build, and deploy applications. See Low-Code-Based Full-Stack Cloud Application .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Node.js Version	The Node.js version for Theia was updated to Node.js 14.	Info only	General Availability	Changed	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	The database-explorer tools can now be used with local database connections on ARM platforms. Note that the limitations of the SAP HANA "hdb" Node.js client apply, for example, SAP HANA User Store connections are not available. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	The SAP HANA Native Application extension now provides access to SAP HANA database development tools from an SAP CAP project. See Configure an SAP CAP Application to Work with Native SAP HANA Artifacts .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	During the creation of a new application project, the SAP HANA Native Application extension now checks if the project's .gitignore file contains an entry for the SAP HANA native database application .env file. See Create a New Business Application Project .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the list of SAP HANA Database Explorer connections can be hidden using the Show Database Explorer Connections setting in User Preferences. See User Preferences for SAP HANA Native Application Development Tools .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, local database connections can now be added using credentials stored in the SAP HANA User Store. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the SQL console can open content from (and save content to) files. See Use the SQL Console for SAP HANA to Query the Database .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the SAP HANA Database Explorer on SAP Business Technology Platform can now be opened from each SAP HANA Database Explorer connection. See View Database Objects with the Database Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the catalog browser now shows the list of database objects. The objects can be filtered by schema. The (filtered) list of objects can be also be searched using the standard Visual Studio Code functionality for the tree view. See View Database Objects with the Database Explorer .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	The SAP HANA Native Application extension now provides context-sensitive descriptions of tags and properties in JSON-based HDI artifacts, for example: hdbrole and hdbroleconfig, hdbgrants, hdbsynonym and hdbsynonymconfig. For common scenarios, templates are provided, too. See Create a Database Role (Getting Started) .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	The SAP HANA Native Application extension now provides JSON syntax validation for the HDI artifacts hdbtabledata and hdblogicalschemaconfig. See SAP HDI Artifact Types and Build Plugins Reference (SAP HANA Cloud Database) .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, you can now use the project explorer to bind a module to the default service. A new option also enables you to bind (and unbind) all the services specified in an application's mta.yaml file. When binding a module to an existing service, a new warning is shown. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the project explorer now provides a setting for clearing the deployment log when a new deployment is started. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, you can now validate connection details when adding a new database connection to a project. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, a confirmation dialog is now displayed asking if auto-undeploy should be disabled when binding an application to an existing container. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	SAP HANA Development Tooling	In the SAP HANA Native Application extension, the project explorer now shows HDI configuration files in the application project's file tree. See Deploy Artifacts and Set up Database Connections with SAP HANA Projects Explorer .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	Input parameters of a calculation view can now be mapped to the input parameters of a consumed calculation view if this calculation view is consumed via SDA. See Map Input Parameters .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	When replacing a node of a calculation view, it is now also possible to map input parameters. See Replacing Nodes and Data Sources .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	A new configuration option was added to explicitly configure whether a data preview query should be automatically executed. See Preview Calculation View Output .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	The data preview allows the preview of hierarchies on SAP HANA Cloud. See Preview Calculation View Output .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Calculation Views	In addition to constant mapping and the use of pruning configuration table, column-based pruning is now also supported. Column-based pruning allows you to prune individual data sources of a union node, based on whether a data source contributes certain columns. See Create Column-Based Pruning .	Info only	General Availability	New	Technology

Technical Component	Environment	Title	Description	Action	Lifecycle	Type	Line of Business
SAP Business Application Studio	Cloud Foundry	Calculation Views	In the Find Data Source dialog, you can now select/unselect 'Show Services' to show/hide the Service column in the result table, which contains the service information of each object in the table. See Create Calculation Views .	Info only	General Availability	New	Technology
SAP Business Application Studio	Cloud Foundry	Support for Dynamic Routing	There is no longer a limit on the number of applications (ports) running at the same time.	Info only	General Availability	Changed	Technology

2021 What's New for SAP Business Application Studio (Archive)

Core Components, 2019

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.19.0 .	Info only	Changed	2021-12-20
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	When you add a data model to a CAP project from the Service Center, XML and CDS files are now generated in the project folder. See SAP System Service Provider and SAP API Business Hub Service Provider .	Info only	Changed	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	Calculation views can now be configured to evaluate masked data based on the session user who is running the underlying SQL query rather than the user calling the calculation view. See Mask Column Values .	Info only	New	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	The list of execution hints for calculation views is now easier to find and has been expanded and improved. In addition, each execution hints now includes a short description and, where appropriate, a suggested value. See Quick Reference: Calculation View Properties (Execution Hints) .	Info only	New	2021-12-06

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>It is now possible to deploy artifacts directly from the <i>Get Started with SAP HANA Cloud</i> tutorial in the Guided Development tool in SAP Business Application Studio. See Guided Development ➔ Get Started with SAP HANA Cloud ➔ Deploy Artifacts from SAP HANA Project Explorer in SAP Business Application Studio.</p>	Info only	New	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>You can now use the SQL console for SAP HANA to execute SQL code directly from the integrated development environment (IDE) in SAP Business Application Studio. See Use the SQL Console for SAP HANA to Query the Database.</p>	Info only	New	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>Enable data preview using a different database user. See Preview Calculation View Output.</p>	Info only	New	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>Improved usability when debugging a calculation view. See Debug Calculation Views.</p>	Info only	Changed	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>The default join in a star join is set to left-outer instead of referential. See Supported Join Types.</p>	Info only	Changed	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>Calculated columns, input parameters, and restricted columns can be filtered. See Working With Attributes and Measures.</p>	Info only	New	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>Roles can be chosen graphically when creating a synonym. See Create Calculation Views.</p>	Info only	New	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>You can configure additional keyboard shortcuts for various modeling actions. See Calculation View Editor: Keyboard Shortcuts.</p>	Info only	Changed	2021-12-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	<p>You can now click to connect to an ABAP system directly from the Service Center, without using the connect button. See SAP System Service Provider.</p>	Info only	Changed	2021-11-22
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	<p>SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.15.0 </p>	Info only	New	2021-09-26

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	You can now generate a sample service based on selected entities when adding a data model to a CAP project from the Service Center. See Service Center .	Info only	New	2021-09-13
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	When you include objects in a calculation view that are outside a project, the calculation view editor can now display the name of the service through which an external object is accessible. See Consume Objects That are not Included in Your Development Project .	Info only	New	2021-09-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	The SAP API Business Hub service provider is now displayed in the Service Center. You can explore OData-based services from 5 SAP products. See SAP API Business Hub Service Provider .	Info only	New	2021-08-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	HTML5 Application Development	You can now create an HTML5 project based on the selected SAP API Business Hub service and locally run it from SAP Business Application Studio. See Run Your HTML5 Application with the SAP API Business Hub .	Info only	New	2021-08-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now create an SAP Fiori project based on the selected SAP API Business Hub service and locally run it from SAP Business Application Studio. See Develop SAP Fiori Applications with SAP Fiori tools .	Info only	New	2021-08-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>The Calculation View Editor has the following new features:</p> <ul style="list-style-type: none"> • You can define your own keyboard shortcuts for common modeling actions in the calculation. See Calculation View Editor: Keyboard Shortcuts • You can copy and paste elements such as input parameters, variables, calculated columns, restricted columns, and hierarchies. See Copying Calculation View Elements • You can change the join type and cardinality directly from the Properties view when a non-equi-join uses an expression. See Create Joins. 	Info only	New	2021-08-10

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	You can now create Document Store Collection Index (.hdbcollectionindex) artifacts in projects with feature version 1006 or higher. See Document Store Collection Index (.hdbcollectionindex) .	Info only	Changed	2021-08-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	The configuration of new projects now includes a mapping for Document Store Collection Index (.hdbcollectionindex) artifacts.	Info only	New	2021-08-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now create CAP applications when working in any type of dev space by selecting the CAP Tools additional extension. Selecting this extension will automatically select any other additional extension that is required to have all the CAP capabilities within the current dev space. See Creating a Project .	Info only	New	2021-07-17
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	HTML5 Application Development	You can now create, run, build, and deploy a React.js HTML5 application to the Cloud Foundry environment. See Developing an HTML5 Application for Cloud Foundry .	Info only	New	2021-07-04
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Free Tier	The SAP Business Application Studio free tier is now available. See Application Plans .	Info only	New	2021-07-01
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	You can now create an SAP Fiori application from the Service Center. See Service Center .	Info only	New	2021-06-21
SAP Business Application Studio	Extension Suite - Digital Process Automation	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.13.0 .	Info only	Changed	2021-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	When using the SAP HANA Native Application development tools to create a database artifact, the last-used path is now stored as a workspace setting, which you can edit and configure manually, too. See Add Database Artifacts to your SAP HANA Cloud Database Application .	Info only	New	2021-06-21

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	You can now use the SAP HANA calculation view graphical editor to reference and include objects outside of a project much more easily. See SAP HANA Cloud, SAP HANA Database Modeling Guide for SAP Business Application Studio .	Info only	New	2021-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	You can now use the Replace data source dialog in the SAP HANA calculation view graphical editor to configure and edit data sources more easily. See SAP HANA Cloud, SAP HANA Database Modeling Guide for SAP Business Application Studio .	Info only	New	2021-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	You can now use the SAP HANA calculation view graphical editor to replace a data source with an existing node within a calculation view. See SAP HANA Cloud, SAP HANA Database Modeling Guide for SAP Business Application Studio .	Info only	New	2021-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	You can now use the SAP HANA calculation view graphical editor to change the order of variables and parameters in the semantics node of a calculation view. See SAP HANA Cloud, SAP HANA Database Modeling Guide for SAP Business Application Studio .	Info only	New	2021-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	The V4 services are now supported in the Service Center catalog. See Service Center .	Info only	New	2021-06-06
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAPUI5 Adaptation Projects	You can now use Cloud Foundry business services as base apps for creating an SAPUI5 Adaptation Project and deploy the built project to the Cloud Foundry environment. See Create an Adaptation Project on Cloud Foundry .	Info only	New	2021-05-26
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	You can now add a service to a CAP project from the Service Center. See Service Center .	Info only	New	2021-05-09
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	HTML5 Application Development	The Basic HTML5 Application template is now available when creating an HTML5 project from the template wizard. See Create an HTML5 Project .	Info only	New	2021-05-09
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now run your CAP Java application using remote Cloud Foundry services that are bound to the application. See Creating Run Configurations for CAP Java Applications .	Info only	New	2021-05-09

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.12.0 .	Info only	Changed	2021-05-09
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	You can now add new systems (destinations) to the SAP Business Application Studio account from the Service Center. See Service Center .	Info only	New	2021-04-25
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	You can now use the graphical user interface to choose a time-data table when creating a time-based dimension calculation view. See SAP HANA Cloud , SAP HANA Database Developer Guide for Cloud Foundry Multitarget Applications .	Info only	New	2021-04-25
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	You can now validate the JSON schema when creating JSON-based database artifacts. See SAP HANA Cloud , SAP HANA Database Developer Guide for Cloud Foundry Multitarget Applications .	Info only	New	2021-04-25
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	<p>You can now perform the following actions when creating a calculation view using the graphical editor:</p> <ul style="list-style-type: none"> • Calculation-view refactoring. • Display a data preview of a calculation view. • Display an intermediate data preview directly from calculation-view nodes. <p>SAP HANA Cloud, SAP HANA Database Developer Guide for Cloud Foundry Multitarget Applications</p>	Info only	New	2021-04-25
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	A .gitignore file is now added at the project level when a new project is created. See SAP HANA Cloud , SAP HANA Database Developer Guide for Cloud Foundry Multitarget Applications .	Info only	New	2021-04-25
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	The SAP Fiori Freestyle Project and the SAP Fiori Freestyle Module templates have been deprecated. These templates are no longer displayed in the wizards during project and module creation. You can still access these templates by entering Open Template Wizard in the command palette.	Info only	Changed	2021-04-25

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Service Center	You can now explore services from your SAP Business Application Studio account destination using the Service Center. The services can be used as data sources in your application and you can trigger application development from the Service Center. See Service Center .	Info only	New	2021-04-11
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	HTML5 Application Development	You can now create, run, build, and deploy a Vue.js HTML5 application to the Cloud Foundry environment. See Developing an HTML5 Application for Cloud Foundry .	Info only	New	2021-04-11
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Java	You can now configure the Java version in your Java applications to either JavaSE-11 or JavaSE-1.8. See Additional Extensions .	Info only	Changed	2021-04-11
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.11.0 .	Info only	Changed	2021-03-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Java	You can now develop Java applications using the Java development tools in any dev space.	Info only	New	2021-03-14
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Java	The Java development tools now include the Java Test Runner and Project Manager for Java extensions.	Info only	New	2021-03-14
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	You can now create a user-provided service using the deployment target container database information.	Info only	New	2021-02-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Welcome Page	The Welcome page now includes sample projects depending on the extensions enabled in your dev space.	Info only	Changed	2021-02-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	The CDS graphical modeler is now part of the CAP predefined extensions. There is no need to enable it manually. See Full Stack Cloud Application .	Info only	Changed	2021-02-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	The CAP Node run configurations now support db dependencies of `kind:sql`.	Info only	Changed	2021-02-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	The 'cds-dk' has been updated to version 3.4.0.	Info only	Changed	2021-02-28

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.10.0 .	Info only	Changed	2021-02-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Task Explorer	You can now build and deploy MTA projects for specific SAP scenarios using the Task Explorer. You can create and edit the task parameters using a dedicated UI. See Task Explorer .	Info only	New	2021-02-14
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Storyboard	The Storyboard feature is now available for CAP applications. The Storyboard is a detailed graphical view for CAP applications, presenting their logical components and the connections between them. See Storyboard and Project Explorer .	Info only	New	2021-02-14
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	Changes to CAP Node Run Configurations: All run configurations that were created without a profile will now reflect their development profile. In addition, when a new run configuration is created, it will be created as a configuration for the development profile unless another profile is specified. See Creating Run Configurations for CAP Node Applications .	Info only	Changed	2021-02-14
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Import Files	You can now import any ZIP project from your local file system to SAP Business Application Studio.	Info only	New	2021-01-31
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Landing Page	When opening SAP Business Application Studio for the first time, or when you have no dev spaces, the landing page opens. The landing page guides you through features of SAP Business Application Studio and enables creation of dev spaces of different types.	Info only	New	2021-01-31
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	The 'cds-dk' has been updated to version 3.3.3.	Info only	Changed	2021-01-31
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.9.0 .	Info only	Changed	2021-01-31

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now use the new approuter configuration template to add an approuter configuration with its dependencies to your MTA project. The template adds an additional managed or standalone approuter to an existing "mta.yaml" file.	Info only	New	2021-01-17
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now install 'cds-dk' versions from the terminal. The updated version overwrites the default version provided with the extension. Restarting the dev space will not revert the change.	Info only	New	2021-01-17
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Running SAP Fiori Applications	You can now run your application locally, without binding an xsuaa service, when you have the 2.0.1 version of the html5-repo-mock dev dependency.	Info only	Changed	2021-01-17

2020 What's New for SAP Business Application Studio (Archive)

Core Components, 2019

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Extension Development	From the new Extensions View, you can now extend your dev space with VS Code extensions from the Open VSX Registry . You can also create your own SAP Business Application Studio extensions, which include the VS Code extensions and the Yeoman generators that you want to install, and make them available in your subaccount. See Extending SAP Business Application Studio .	Info only	New	2020-12-27
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Application Wizard	SAP Business Application Studio developers can now type a template name in the command palette to trigger the relevant wizard.	Info only	Changed	2020-12-27
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Welcome Page	The Welcome page now has a new look and feel.	Info only	Changed	2020-12-27
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.8.0 .	Info only	Changed	2020-12-27

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP HANA	The SAP HANA Tools are now available. You can now create an SAP HANA native application dev space in SAP Business Application Studio or add the tools as an additional extension to other dev spaces. See SAP HANA Native Application .	Info only	New	2020-12-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	The 'cds-dk' has been updated to version 3.2.0.	Info only	Changed	2020-11-22
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.7.0 .	Info only	Changed	2020-11-22
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Guided Development	You can now use the Guided Development tool to execute common development tasks for specific SAP scenarios based on the best practices defined by SAP experts. See Guided Development .	Info only	New	2020-10-25
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Extension Development	You can now prompt information, error, and warning messages via notifications in the Project Creation wizard steps. See Create a Project Using the Wizard .	Info only	New	2020-10-25
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.6.0 .	Info only	Changed	2020-10-25
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Dev Space Manager	You can now add extensions to an existing dev space. See Working in the Dev Space Manager .	Info only	New	2020-10-11
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Running SAP Fiori Applications	You can now run multiple SAP Fiori applications as components in the SAP Fiori launchpad sandbox. See Run Applications in the SAP Fiori Launchpad Environment .	Info only	New	2020-10-11
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Project Wizard	You can now open the Project Wizard from the File menu. See Create a Project Using the Wizard .	Info only	New	2020-10-11
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now create run configurations for CAP Java applications for specific runtime Spring Boot profiles. See Creating Run Configurations for CAP Java Applications .	Info only	New	2020-10-11

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.5.0 .	Info only	Changed	2020-10-11
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Installing Generators	You can now install external generators from the npm registry to SAP Business Application Studio. You can then access these generators from the Yeoman UI wizard to use the templates. See Explore and Install Generators .	Info only	New	2020-10-05
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Running SAP Fiori Applications	You can now bind multiple data sources to your run configuration. See Creating Run Configurations for SAP Fiori Applications .	Info only	New	2020-09-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now create run configurations for CAP Node applications for specific runtime profiles. See Creating Run Configurations for CAP Node Applications .	Info only	New	2020-09-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	MTA	You can now edit the MTA descriptor file (<code>mta.yaml</code>) using the MTA Editor. See MTA Editor .	Info only	New	2020-09-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Running SAP Fiori Applications	You can now run an SAP Fiori application locally with an SAP API Business Hub service. See Run Your Application with the SAP API Business Hub .	Info only	New	2020-09-13
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now use the CDS Graphical Modeler when developing CAP applications. See Design CDS Models Using SAP Business Application Studio	Info only	New	2020-08-30
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Running SAP Fiori Applications	You can now run your SAP Fiori project's automated tests using Karma. See Run Automated Tests of Your Application .	Info only	New	2020-08-30
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now add an SAP Fiori module to an existing MTA project. See Add an Additional SAP Fiori Application to Your Project .	Info only	New	2020-08-30
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now use quick fix for missing IDs in XML view files. See Validation of Stable IDs .	Info only	Changed	2020-08-30

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now develop an SAP Fiori application consuming a CAP service, run it locally, build, and deploy it to Cloud Foundry. See Developing an SAP Fiori Application for a CAP Project .	Info only	New	2020-08-16
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now develop an SAP Fiori application consuming a service from an ABAP Cloud System, run it locally, build, and deploy it to Cloud Foundry, using the managed approuter or a standalone approuter. See Develop an Application for Cloud Foundry .	Info only	New	2020-08-16
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now develop an SAP Fiori application and deploy it to an ABAP Cloud System. See Developing an SAP Fiori Application Based on an ABAP Cloud System Service .	Info only	New	2020-08-16
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Deployment	You can now perform "abap deploy" in your local environment, outside of SAP Business Application Studio. See abap-deploy npm documentation and Deploy to the SAPUI5 ABAP Repository .	Info only	New	2020-08-16
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	Development of CAP applications is now available in the China (Shanghai) region.	Info only	New	2020-08-16
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now deploy your SAP Fiori application to the SAPUI5 ABAP Repository in SAP S/4HANA Cloud. See Deploy to the SAPUI5 ABAP Repository .	Info only	New	2020-08-02
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now use Spring-boot tools when developing Spring-boot applications. See spring-projects .	Info only	New	2020-08-02
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	SAP Business Application Studio has been updated to include SapMachine 11. See SapMachine .	Info only	Changed	2020-08-02
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	The XML UI5 code validation is now enhanced with stable ID checks. See Validation of Stable IDs .	Info only	Changed	2020-08-02
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	SAP Fiori is now selected by default when choosing the type of dev space to create in SAP Business Application Studio.	Info only	Changed	2020-08-02

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Trial landscape	When you subscribe to SAP Business Application Studio in the Trial Landscape, the relevant roles are automatically assigned to the account.	Info only	New	2020-07-19
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now run your CAP Node.js application from the Run Configurations view and bind it to an instance of SAP HANA Cloud or an instance of hanatrial. See Creating Run Configurations for CAP Node Applications .	Info only	New	2020-07-19
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.3.0.	Info only	Changed	2020-07-19
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can develop SAP Fiori applications for Cloud Foundry using the approuter on the subaccount level and run an HTML5 application managed by SAP BTP. See Create an SAP Fiori Project and Deploy Your Application .	Info only	New	2020-06-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now run your CAP Node application from the Run Configurations view and bind it to a destination. See Creating Run Configurations for CAP Node Applications .	Info only	New	2020-06-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now run your CAP Node application from the Run Configurations view using mock OData services. See Creating Run Configurations for CAP Node Applications .	Info only	New	2020-06-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now run your CAP Node application from the Run Configurations view and deploy it out-of-the-box to an SAP HANA database. See Creating Run Configurations for CAP Node Applications .	Info only	New	2020-06-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	It is now possible to open concurrent embedded graphical editors in SAP Business Application Studio and even display them side by side.	Info only	New	2020-06-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.2.0.	Info only	Changed	2020-06-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	The XML UI5 code validation is now enhanced with type aggregation and deprecation checks. See Develop Your Application .	Info only	Changed	2020-06-28

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	The XML UI5 code assist provides settings for deprecated and experimental element proposals. See Develop Your Application .	Info only	Changed	2020-06-28
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	SAPUI5 Adaptation Project is now available in SAP Business Application Studio. You can create an app variant for an existing SAP Fiori application and make use of the extension capabilities for UI5 controls. See Extending an SAP Fiori Application .	Info only	New	2020-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.1.0.	Info only	Changed	2020-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Dev Space Manager	You can now open a dev space in a separate browser tab.	Info only	New	2020-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	The XML UI5 code validation is now enhanced with duplicate ID and aggregation cardinality checks. See Develop Your Application .	Info only	New	2020-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now develop using Fiori elements.	Info only	New	2020-06-21
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Application Wizard	The Application Wizard has been enhanced. Steps are now clickable and you can press 'Enter' in the login control.	Info only	Changed	2020-06-07
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	The Run Configuration tree shows 'shared' dependencies.	Info only	New	2020-06-07
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now add a launchpad to an SAP Fiori project with a Cloud Foundry target runtime. See Basic Development Flow in SAP Business Application Studio .	Info only	New	2020-06-07
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP BTP Regions	SAP Business Application Studio Trial is now available in the AWS US East (VA) region.	Info only	New	2020-05-24
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Deployment	You can now deploy SAP Fiori applications to the HTML5 repository using the Generic Application Content Deployer (GACD).	Info only	New	2020-05-24

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Theia	SAP Business Application Studio has been updated to include fixes and improvements that are part of Eclipse Theia 1.0.0.	Info only	Changed	2020-05-24
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Application Wizard	The New Application wizard now has a Back button. You can go to previous steps to change or view your entries.	Info only	New	2020-05-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Application Wizard	You can now choose the location where the new projects should be generated.	Info only	Changed	2020-05-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Consume SAP Services	You can now insert a direct URL to consume a service and bind it to your project.	Info only	Changed	2020-05-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	MTA	With the new Cloud MTA Build Tool version 1.0.14, you can use the module build features directly in SAP Business Application Studio. See Auxiliary Commands .	Info only	New	2020-05-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now run your CAP Node application from the Run Configuration view and bind to a local sqlite database.	Info only	New	2020-05-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now specify a package and transport when deploying an SAP Fiori application to ABAP.	Info only	New	2020-05-10
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	The 'cds-dk' has been updated to version 1.6.4 and the 'generator-cap-project' to version 1.0.6.	Info only	Changed	2020-04-26
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now view data models from external services in the CAP project explorer.	Info only	New	2020-04-26
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori project creation	When using freestyle templates, you can now consume services and bind entities.	Info only	New	2020-04-26
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	You can now configure multiple data sources in SAP Fiori run configurations for Cloud Foundry. Cloud Foundry login is not required.	Info only	New	2020-04-26
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now get SAPUI5 code assist for XML views and fragments.	Info only	New	2020-04-26

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Development	You can now get code validation for the application descriptor (<code>manifest.json</code> file).	Info only	New	2020-04-26
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Cloud Foundry Tools	When you create a service instance, you can outline the service parameters.	Info only	New	2020-04-26
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SAP Fiori Deployment	You can now deploy HTML5 modules independently, using the 'HTML5 Applications repository CLI' plugin. You can then inspect these modules in runtime. See Deploy Your Application .	Info only	New	2020-04-26
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	SQL Tools	We have updated the SQL Tools to version 0.21.6. With this version, you can now connect to SAP HANA as a Service (HaaS).	Info only	Changed	2020-04-12
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CAP	You can now create a CAP application using the command palette or the terminal.	Info only	New	2020-04-12
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Data Privacy	When an account is closed or when an administrator unsubscribes from SAP Business Application Studio, all the tenant's data is deleted automatically.	Info only	Changed	2020-04-12
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Project Wizard Tool	A default run configuration is now created as part of the project wizard flow. You can create a project from template and run it. i Note Not applicable for CAP applications.	Info only	New	2020-04-12
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Project Wizard Tool	When the project wizard ends, you can now choose between Open New Workspace to open the generated project in the root, or Add to Workspace to work in multi-root.	Info only	New	2020-04-12
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	You can now run an SAP Fiori application with a Cloud Foundry target runtime consuming an ABAP on-premise service.	Info only	New	2020-04-12
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Consuming SAP Services	You can now perform service exploration in both the V2 and v4 formats.	Info only	New	2020-03-29

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Cloud Foundry Tools	The Cloud Foundry tools have been moved to the 'npm' package so that they can be used externally.	Info only	Changed	2020-03-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Project Creation	New features have been added to the project wizard, such as displaying prompts in advance, login control, and browse control.	Info only	Changed	2020-03-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	When running an SAP Fiori app locally, you can now select the SAPUI5 version. See Creating Run Configurations for SAP Fiori Applications .	Info only	New	2020-03-29
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Extensions	SAP Mobile Services Use the Mobile Development Kit (MDK) editor to edit various aspects of your MDK application such as validating and bundling the MDK app, creating MDK metadata objects, and deploying the MDK app to Mobile Services. You can also use the MBT tool to create an OData CSDL file and generate an OData service in Java from an OData CSDL file. See Setting Up the Editor in SAP Business Application Studio .	Info only	New	2020-03-15
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	You can now use Local Run with test (mock) data when testing the "Consume SAP Services" tool in VS Code.	Info only	New	2020-03-15
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Consuming SAP Services	When running a CAP Node application using the Run Configuration view, you can now easily bind it to depending Cloud Foundry services. See Creating Run Configurations for CAP Node Applications .	Info only	New	2020-03-15
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Extensions	The following tools are now installed and exposed via the CLI as part of the Basic Tools extension: make, bzip2, patch, perl, tar, sqlite3, vim, zip, and pv.	Info only	New	2020-03-15
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	Freestyle SAPUI5 templates are available for project creation using the terminal. See Create an SAP Fiori Project .	Info only	New	2020-03-15
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	The development dependencies to SAP Fiori projects are now installed upon project creation.	Info only	New	2020-03-15

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	When running an SAP Fiori app locally, you can now select if you want to run it from the 'build' folder or from the 'source' folder. See Creating Run Configurations for SAP Fiori Applications .	Info only	New	2020-03-15
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	You can now choose the relevant HTML file, such as a QUnit test or a mock server, when creating run configurations for a SAP Fiori application deployed to Cloud Foundry. See Creating Run Configurations for SAP Fiori Applications .	Info only	New	2020-03-01
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Working with CAP Applications	You can now use the Project Explorer feature for CAP applications. See Storyboard and Project Explorer .	Info only	New	2020-03-01
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Running SAP Fiori Applications	You can now select an HTML file from the Run Configurations view to run your SAP Fiori project.	Info only	New	2020-03-01
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Develop Application Based on an ABAP Service Catalog	You can now develop an SAP Fiori application consuming a service from the ABAP Service Catalog. See Developing an SAP Fiori Application Based on an SAP S/4HANA or ECC System .	Info only	New	2020-02-16
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	You can now create and manage a run configuration for the Java service of an MTA application via the Run Configurations view. See Creating Run Configurations for Java Modules . i Note Available in AWS and Azure regions only.	Info only	New	2020-02-02
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Run Configurations	You can now create run configurations for CAP applications and the Java service of MTAs within a multi-root workspace. See Multi-root Workspaces . i Note Available in AWS and Azure regions only.	Info only	New	2020-02-02

Technical Component	Capability	Environment	Title	Description	Action	Type	Available as of
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Extensions	You can now trigger an MTA build and deploy it from a context menu and the command palette. See Building and Deploying Multitarget Applications .	Info only	New	2020-02-02
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Deploy to ABAP	You can now deploy an existing SAP Fiori project from SAP Business Application Studio to the SAPUI5 ABAP repository. See Deploy to the SAPUI5 ABAP Repository .	Info only	New	2020-02-02
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Develop Application Based on ABAP Cloud System	You can now develop an SAP Fiori application consuming a service from ABAP Cloud System Service catalog. See Developing an SAP Fiori Application Based on an ABAP Cloud System Service .	Info only	New	2020-02-02
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Extensions	You can use the VS Code REST Client in your dev spaces. See VS Code REST Client .	Info only	New	2020-01-16
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	CDS Extensions	We have updated the CDS extension to use @sap/cds-dk version 1.3.1.	Info only	New	2020-01-16
				i Note Available in AWS and Azure regions only.			
SAP Business Application Studio	Extension Suite - Development Efficiency	Cloud Foundry	Consuming SAP Services	You can now select a data source for your project from the service catalog of an ABAP system. The destination will appear with the "Catalog" descriptor. See Consuming SAP Services .	Info only	New	2019-11-14

Developer Guide

With SAP Business Application Studio, you can develop business applications for the Intelligent Enterprise.

i Note

To work in SAP Business Application Studio, your subaccount must be subscribed to the SAP Business Application Studio application. See [Getting Started](#).

If you are working in a trial account, follow the procedure in [Getting Started with a Trial Account](#).

[Dev Spaces in SAP Business Application Studio](#)

A dev space is a development environment with the tools, capabilities, and resources needed for developing your application.

[Working in SAP Business Application Studio](#)

SAP Business Application Studio provides the features needed for the entire life cycle of your application, from the moment you create the project until it is ready to be deployed.

[Working with a Trial Account](#)

Get a trial account to experience SAP Business Application Studio for free.

[Restrictions](#)

[Troubleshooting](#)

[Contact SAP Support](#)

We suggest you report an incident or error through the SAP Support Portal.

Dev Spaces in SAP Business Application Studio

A dev space is a development environment with the tools, capabilities, and resources needed for developing your application.

A dev space provides tailored tools and pre-installed runtimes for your business scenario. This simplifies and saves time in setting up your development environment and allows you to efficiently develop, test, build, and run your solution locally or in the cloud.

Each dev space type contains a set of predefined extensions that help improve your experience.

An SAP Business Application Studio extension is a set of tools that help you perform a specific development task. For example, the **Java Tools** extension provides you with the tools that you need to develop a Java application. The **Fiori Tools** extension includes the templates, CLI, and code completion required to create an SAP Fiori application.

During dev space creation, you can choose to add additional extensions to the dev space. The additional extensions provide additional tools to supplement the application with additional components for the scenario to your developer environment. See [Additional Extensions](#).

You can also add extensions to an existing dev space. See [Add Extensions to Your Dev Space](#).

When creating a new dev space, select the dev space type that best fits the application you want to create. See [Dev Space Types](#).

Configure Your Dev Space Settings

You can configure your preferred settings for working in the dev space:

1. Open your dev space.
2. From the left-side menu, select .
3. Configure your settings:
 - o Keyboard shortcuts
 - o Color theme
 - o File icon theme
 - o General preferences

i Note

Settings are relevant per dev space. You must configure your settings for each dev space separately.

You can create, delete, stop, and start dev spaces. You can also download dev space content, and import dev space content. See [Working in the Dev Space Manager](#).

i Note

Dev spaces not used for more than 30 days are archived to save on disk space. You can still access them just like any other dev space, but they might take up to 1 minute longer to load.

Using Additional Tools

It is possible to install additional tools on a dev space or consume additional software components for developing applications using the terminal, the dedicated UI, or directly in the code.

i Note

SAP provides you with a mechanism to access third party sites to view and download open-source, 3rd party or its own tools, libraries, or software components (“Extensions”) to dev spaces in SAP Business Application Studio. Using this mechanism, you can view and install Extensions at your own risk.

SAP does not certify or endorse any of the third-party sites or Extensions, and they are not part of SAP Business Application Studio.

You must ensure that you have all the necessary rights to use these Extensions.

You are responsible for all aspects of the Extensions, including maintenance, management, security, and support.

You will assume all responsibility for any negative effects caused by or relating to the Extensions.

SAP may disable any dev space that includes Extensions that cause system malfunction or that SAP reasonably believes may cause harm to SAP systems.

Working in the Dev Space Manager

You can create, delete, stop, and start dev spaces. You can also download dev space content, and import dev space content.

Create a Dev Space

You can generate a dev space to create and manage applications. You can select the application type that includes the extensions that you need to do a development task.

1. Open SAP Business Application Studio and log in with your credentials.
2. Click **Create Dev Space**.
3. Enter a name for the dev space.
4. Select the relevant application type.
5. (Optional) Select the relevant additional extensions to enhance your space.

You can also add or remove extensions later. See the [Add Extensions to Your Dev Space](#) section.

6. Click **Create Dev Space**.

i Note

You can only click the button if you entered a dev space name.

i Note

Dev Space creation is influenced by the application plan you are using.

- If you are using a productive account, see SAP Business Application Studio [Restrictions](#).
- If you are using a free account, see [Free Plan Restrictions](#).
- If you are using a trial account, see [Trial Account Restrictions](#).

Stop, Start, or Delete Your Dev Space

If you don't need to work with your dev space for a while, you can stop your dev space. When your dev space is running, it consumes memory, energy, and CPU. If you don't use your dev space and it sits idle for a while, the dev space is stopped.

When you restart your stopped dev space, all content in your dev space, including files and settings, are available. If you want to apply updates to extensions and bug fixes, you must stop your dev space and start it again.

You can also delete your dev space.

i Note

By creating a dev space, you create a project and file system for yourself. If you delete your dev space, you can't recover it. We recommend syncing, backing up, and saving your project to a Git repository. See [Connect to Your Git Source Control System](#).

Add or Remove Extensions

You can change the extensions you selected for your dev space.

1. From the Dev Space Manager, click  to edit the dev space.

i Note

To edit an extension, the dev space must be in the stopped state.

2. Select the additional SAP extensions that you want to add, or clear the checkmark from extensions you want to remove.
3. Click [Save Changes](#).

Download Dev Space Content

You can download the dev space content in the following situations:

- When your dev space is in the **RUNNING** state to save the dev space contents.
- When your dev space is in the **ERROR** state to recover your data and move the contents to another dev space.

To download the content of your dev space, click  and then [Download](#).

If your dev space is in the **ERROR** state, after the download begins, the dev space state changes to **STARTING**. The dev space state then changes to **SAFE MODE** and then the tar file downloads.

After the dev space changes to **SAFE MODE**, it's not possible to return to the **RUNNING** state. You can only download the dev space content and delete the dev space.

When the export process is complete, the tar file, with the dev space content, is downloaded.

i Note

After exporting the dev space content, check the size of the dev space before uploading. Make sure that the size doesn't exceed 10 GB.

Import Dev Space Content

After downloading the dev space content, you can import the content to another dev space:

1. Create a new dev space, start it, and open it.
2. From the Explorer view, click **Open Folder**.
The path to the user folder (/home/user/) is displayed in the command palette.
3. Click **OK** to open the user folder.
4. Right-click the projects folder and click **Upload...**
5. From the **Downloads** folder, choose the file with the dev space content.
6. Right-click the projects folder and click **Open in Integrated Terminal**.
7. Enter the following command to uncompress the uploaded file:

```
tar xvzf <Your.tar.gzFile>
```

Dev Space Types

When creating a new dev space, select the dev space type that best fits the application you want to create.

SAP Business Application Studio has the following dev space types:

- [SAP Fiori](#): Develop SAP Fiori applications based on various environments, including Cloud Foundry, ABAP Cloud, and SAP S/4HANA.
- [Full-Stack Application Using Productivity Tools](#): Easily develop, test, build, and deploy apps using high productivity tools.
- [Full Stack Cloud Application](#): Build business services, business applications, and extend S/4HANA using the SAP Cloud Application Programming Model, Fiori and [Java](#) or [Node.js](#).
- [SAP HANA Native Application](#): Build and deploy native SAP HANA applications or analytical models. This dev space contains a comprehensive set of editors to support the creation of database artifacts (calculation views, tables, SQLScript procedures, and more), as well as tools to enable an end-to-end development flow from project creation to the deployment to the SAP BTP.
- [SAP Mobile Application](#): The SAP Mobile Development Kit (MDK) lets you customize, deploy, and manage your customized iOS and Android apps in the cloud.

- **Basic:** Contains the SAP basic tools extension.

SAP Fiori

Develop SAP Fiori applications based on various environments: Cloud Foundry, ABAP on-prem, and ABAP Cloud.

See [Develop SAP Fiori Applications with SAP Fiori tools](#).

Migration from SAP Web IDE

If you have projects that were created using SAP Web IDE, you can migrate them to SAP Business Application Studio. See [Migration](#) in the *SAP Fiori tools Users Guide*.

The SAP Fiori scenario contains the following predefined extensions:

- **SAPUI5 Adaptation Project**

Allows you to extend SAPUI5 applications, using the Adaptation Project and the Visual Editor. See [Extending an SAP Fiori Application](#).

- **Basic Tools**

Allows you to optimize your web development workflow. The extension includes capabilities such as a code editor, file management capabilities, split view and window management, preferences and settings.

- **Fiori Freestyle Tools**

Allows you to optimize your Fiori-based development. This extension provides Fiori templates with the following tools:

- UI5 CLI
- Grunt CLI
- abap-deploy CLI

- **HTML5 Runner**

Allows you to locally run HTML5 applications. This extension includes the HTML5 application runner and run configurations.

See [Create Run Configurations for HTML5 Applications](#).

- **MTA Tools**

Allows you to perform operations such as build, deployment, and validation on multitarget applications. The following tools will be installed as part of the extension:

- Cloud Foundry environment CLI
- Cloud Foundry environment deployment plugin
- Cloud MTA Build Tool
- MTA module runner (VS Code extension)

See [MTA Tools](#).

- **SAP Fiori Tools**

Allows you to simplify the development of SAP Fiori elements applications by providing extensions that can help you create applications, visualize navigation, automatically generate code, and more. The following extensions will be

installed:

- Fiori elements Yeoman Generator
- Application Modeler
- Guided Development
- Service Modeler
- XML Annotation Language Server

See [Getting Started with SAP Fiori tools](#).

- **Startup Server**

Allows you to leverage a trigger and perform an action.

- **SAPUI5 Layout Editor & Extensibility**

Allows you to visually develop your XML view and extend an existing SAPUI5 application that resides in the SAPUI5 ABAP repository.

See [Working with the Layout Editor](#) and [Extend SAPUI5 Applications](#).

Full-Stack Application Using Productivity Tools

Easily develop, test, build, and deploy apps using high productivity tools.

See [Develop a Business Application Using Productivity Tools](#).

The Full-Stack Application Using Productivity Tools scenario contains the following predefined extensions:

- **Basic Tools**

Allows you to optimize your web development workflow. The extension includes capabilities such as a code editor, file management capabilities, split view and window management, preferences and settings.

- **CDS Graphical Modeler**

Allows you to design SAP core data service models in SAP Cloud Business Application development projects.

The extension includes the CDS Editor, which provides capabilities for SAP business developers to visually design SAP CDS models. Models include artifacts, such as entities, types, unstructured types, enums, arrayed types, events, associations and compositions, and projects and services, which accelerate SAP Cloud Business Application development.

See [Design CDS Models Using SAP Business Application Studio](#).

- **CAP Tools**

Allows you to develop applications based on CDS using the CDS command line and tools.

Includes enhanced code editors and database management capabilities.

- **Productivity Tools**

Collection of low code tools enabling developers to easily build full stack applications for desktop and mobile use.

- **Mobile Services App Development Tools**

Allows you to build end to end mobile applications. From modeling and generating OData services, creating mobile native apps from metadata with MDK to building content for SAP Mobile Cards.

- **Fiori Freestyle Tools**

Allows you to optimize your Fiori-based development. This extension provides Fiori templates with the following tools:

- UI5 CLI
- Grunt CLI
- abap-deploy CLI

- **HTML5 Runner**

Allows you to locally run HTML5 applications. This extension includes the HTML5 application runner and run configurations.

See [Create Run Configurations for HTML5 Applications](#).

- **Java Tools**

Allows you to develop, test, and run Java applications. Includes debugging capabilities and enhanced code editors. The following tools are installed as part of the extension:

- Redhat Java V 0.76.0
- Project Manager for Java V 0.18.1
- Java Test Runner V 0.28.0
- Wing Java Run V 1.6.0
- Springboot Tools V 1.19.0-RC.1
- Java Debug V 0.31.0

See [Language support for Java™ for Visual Studio Code](#), [Debugger for Java](#), [Spring Boot tools](#), [Java Test Runner](#), and [Project Manager for Java](#).

i Note

Not all the features described in the extension documentation are supported.

- **MTA Tools**

Allows you to perform operations such as build, deployment, and validation on multitarget applications. The following tools are installed as part of the extension:

- Cloud Foundry environment CLI
- Cloud Foundry environment deployment plugin
- Cloud MTA Build Tool
- MTA module runner (VS Code extension)

See [MTA Tools](#).

- **SAP Fiori Tools**

Allows you to simplify the development of SAP Fiori elements applications by providing extensions that can help you create applications, visualize navigation, automatically generate code, and more. The following extensions are installed:

- Fiori elements Yeoman Generator

- Application Modeler
- Guided Development
- Service Modeler
- XML Annotation Language Server

See [SAP Fiori Tools](#).

- **Startup Server**

Allows you to leverage a trigger and perform an action.

- **SAPUI5 Layout Editor & Extensibility**

Allows you to visually develop your XML view and extend an existing SAPUI5 application that resides in the SAPUI5 ABAP repository.

See [Working with the Layout Editor](#) and [Extend SAPUI5 Applications](#).

Full Stack Cloud Application

Build business services and business applications and extend SAP S/4HANA using SAP Cloud Application Programming Model, SAP Fiori, and Java or Node.js.

See [Developing a CAP Application in SAP Business Application Studio](#).

The Full Stack Cloud Application scenario contains the following predefined extensions:

- **Basic Tools**

Allows you to optimize your web development workflow. The extension includes capabilities such as a code editor, file management capabilities, split view and window management, preferences and settings.

- **CDS Graphical Modeler**

Allows you to design SAP core data service models in SAP Cloud Business Application development projects.

The extension includes the CDS Editor, which provides capabilities for SAP business developers to visually design SAP CDS models. Models include artifacts, such as entities, types, unstructured types, enums, arrayed types, events, associations and compositions, and projects and services, which accelerate SAP Cloud Business Application development.

See [Design CDS Models Using SAP Business Application Studio](#).

- **CAP Tools**

Allows you to develop CAP applications using the CDS command-line and tools. Includes enhanced code and graphical editors, database management capabilities, and tools for running your application.

- **Fiori Application**

Allows you to create a Fiori application, using the Yeoman generator.

- **Fiori Freestyle Tools**

Allows you to optimize your Fiori-based development. This extension provides Fiori templates with the following tools:

- UI5 CLI
- Grunt CLI

- abap-deploy CLI

- **SAP HANA Database Explorer**

Allows you to access and inspect SAP HANA run-time objects. The extension includes a command that opens the SAP HANA Database Explorer in a new browser tab.

- **Java Tools**

Allows you to develop, test, and run Java applications. Includes debugging capabilities and enhanced code editors. The following tools are installed as part of the extension:

- SapMachine 11
- Maven V 3.8.1
- Tomcat V 9.0.33

See [Language support for Java™ for Visual Studio Code](#), [Debugger for Java](#), [Spring Boot tools](#), [Java Test Runner](#), and [Project Manager for Java](#).

i Note

Not all the features described in the extension documentation are supported.

- **MTA Tools**

Allows you to perform operations such as build, deployment, and validation on multitarget applications. The following tools are installed as part of the extension:

- Cloud Foundry environment CLI
- Cloud Foundry environment deployment plugin
- Cloud MTA Build Tool
- MTA module runner (VS Code extension)

See [MTA Tools](#).

- **SAP Fiori Tools**

Allows you to simplify the development of SAP Fiori elements applications by providing extensions that can help you create applications, visualize navigation, automatically generate code, and more. The following extensions are installed:

- Fiori elements Yeoman Generator
- Application Modeler
- Guided Development
- Service Modeler
- XML Annotation Language Server

See [SAP Fiori Tools](#).

- **Startup Server**

Allows you to leverage a trigger and perform an action.

- **SAPUI5 Layout Editor & Extensibility**

Allows you to visually develop your XML view and extend an existing SAPUI5 application that resides in the SAPUI5 ABAP repository.

See [Working with the Layout Editor](#) and [Extend SAPUI5 Applications](#).

SAP HANA Native Application

Build and deploy native SAP HANA applications or analytical models. This dev space contains a comprehensive set of editors to support the creation of database artifacts (calculation views, tables, SQLScript procedures, and more), as well as tools to enable an end-to-end development flow from project creation to the deployment to the SAP BTP.

See [Working with SAP Business Application Studio](#).

i Note

SAP Business Application Studio needs to connect to the SAP HANA Cloud instance where you want to deploy your application's database artifacts. By default, SAP HANA Cloud accepts all connections from allowed IP addresses in SAP BTP, for example, in the same region and infrastructure where SAP HANA was provisioned.

If you are working on an Azure account or you are trying to connect an SAP HANA instance from a different region, you must configure SAP HANA Cloud to allow connections from the IP address hosting SAP Business Application Studio for your Cloud region and the underlying platform.

To learn how to change the SAP HANA Cloud allowed connections, see [Change Allowed Connections](#).

To find out your SAP Business Application Studio IP address, see [SAP Business Application Studio Availability](#).

The SAP HANA Native Application scenario contains the following predefined extensions:

- **Basic Tools**

Allows you to optimize your web development workflow. The extension includes capabilities such as a code editor, file management capabilities, split view and window management, preferences and settings.

- **SAP HANA Calculation View Editor**

Allows you to edit and manage SAP HANA calculation views. The extension includes the SAP HANA calculation view editor, the synonym editor, and the analytical privilege editor.

See [SAP HANA Cloud Modeling Guide for SAP Business Application Studio](#).

- **SAP HANA Database Explorer**

Allows you to access and inspect SAP HANA run-time objects. The extension includes a command that opens the SAP HANA Database Explorer in a new browser tab.

See [SAP HANA Database Explorer](#).

- **SAP HANA Tools**

Allows you to develop native SAP HANA applications. The extension includes tools such as enhanced graphical and text-based editors, project generators, and productivity tools.

See [SAP HANA Cloud Developer Guide](#).

- **MTA Tools**

Allows you to perform operations such as build, deployment, and validation on multitarget applications. The following tools will be installed as part of the extension:

- Cloud Foundry environment CLI
- Cloud Foundry environment deployment plugin
- Cloud MTA Build Tool
- MTA module runner (VS Code extension)

See [MTA Tools](#).

- **SAP HANA Smart Data Integration Tools**

Allows you to do data federation, replication and transformation in SAP HANA. The extension includes graphical editors such as Flowgraph, Replication Task and File Format editors.

See [Modeling Guide for SAP Web IDE and SAP Business Application Studio](#)

- **Startup Server**

Allows you to leverage a trigger and perform an action.

SAP Mobile Application

The Mobile Development Kit (MDK) lets you customize, deploy, and manage your customized iOS and Android apps in the cloud.

See, [Mobile Development Kit](#).

The SAP Mobile Application scenario contains the following predefined extensions:

- **Basic Tools**

Allows you to optimize your web development workflow. The extension includes capabilities such as a code editor, file management capabilities, split view and window management, preferences and settings.

- **Mobile Services App Development Tools**

Mobile Services App Development Tools enable developers to build end to end mobile applications. From modeling and generating OData services, creating mobile native apps from metadata with MDK to building content for SAP Mobile Cards.

- **HTML5 Runner**

Allows you to locally run HTML5 applications. Includes the HTML5 application runner and run configurations.

See [Create Run Configurations for HTML5 Applications](#).

- **Java Tools**

Allows you to develop and run Java applications. Includes debugging capabilities and enhanced code editors. The following tools will be installed as part of the extension:

- Java JDK V 8
- Maven V 3.8.1
- Tomcat V 9.0.33

See [Language support for Java™ for Visual Studio Code](#) and [Debugger for Java](#).

- **MTA Tools**

Allows you to perform operations such as build, deployment, and validation on multitarget applications. The following tools are installed as part of the extension:

- Cloud Foundry environment CLI
- Cloud Foundry environment deployment plugin
- Cloud MTA Build Tool
- MTA module runner (VS Code extension)

See [MTA Tools](#).

- **Startup Server**

Allows you to leverage a trigger and perform an action.

Additional Extensions

You can extend and enrich your development environment with tools and capabilities based on your needs.

Each dev space contains a group of extensions that enhance its existing functionality. Some extensions are predefined by each development scenario, and others can be manually enabled based on your specific development needs.

The extensions may be used to add specific tools or to add an additional scenario to the dev space.

The list below shows a selection of our most used additional extensions.

i Note

To learn more about the predefined extensions, see [Dev Space Types](#).

Scenario Extensions	
Extension	Description
Basic UI5 Template	<p>Allows you to perform operations such as build and deployment of multitarget applications, while optimizing your web development workflow. The extension includes capabilities such as the Cloud Foundry CLI, a code editor, preferences, and settings. The following tools will be installed as part of the extension:</p> <ul style="list-style-type: none"> • Cloud Foundry environment CLI • Cloud Foundry environment deployment plugin • Cloud MTA Build Tool <p>See Basic Template.</p>
Development Tools for SAP Build Work Zone	<p>Allows you to build UI Integration cards, which are user interface elements that present new means to provide application information to the end user in a unified way. The business information is represented compactly and allows interaction on it being executed. This editor allows users to create new cards or build cards from available samples, edit card properties, and preview the changes. Finally, users can bundle and deploy the cards into different systems. See SAP Build Work Zone, advanced edition Developer Guide.</p>
HTML5 Application Template	<p>Allows you to create an HTML5 application, using a template wizard.</p> <p>See Developing an HTML5 Application for Cloud Foundry.</p>

Extension	Description
HTML5 Runner	<p>Allows you to locally run HTML5 applications. Includes the HTML5 application runner and run configurations.</p> <p>See Create Run Configurations for HTML5 Applications.</p>
SAP BTP, serverless runtime	<p>Allows you to create and deploy extensions in a serverless environment.</p> <p>See https://help.sap.com/viewer/bf7b2ff68518427c85b30ac3184ad215/Cloud/en-US/4c67df38735d48a7be0043a96c6a2827.html.</p>
Workflow Management	<p>Create Extensions with Extension Factory, Allows you to create workflow applications and process templates with SAP Workflow Management.</p> <p>See SAP Workflow Management.</p>

Tool Extensions

Extension	Description
CDS Graphical Modeler	<p>Allows you to design SAP core data service models in SAP Cloud Business Application development projects.</p> <p>The extension includes the CDS Editor, which provides capabilities for SAP business developers to visually design SAP CDS models. Models include artifacts, such as entities, types, unstructured types, enums, arrayed types, events, associations and compositions, and projects and services, which accelerate SAP Cloud Business Application development.</p> <p>See Design CDS Models Using SAP Business Application Studio.</p>
Chromium Browser Tools	Allows you to use Chromium tools.
Headless Testing Framework	<p>Allows you to run cross-platform end-to-end tests on a UI5 application, with selectors compatible to OPA5.</p> <p>See Using BAS with wdi5.</p>

Extension	Description
Java Tools	<p>Allows you to develop, test, and run Java applications. Includes debugging capabilities and enhanced code editors. The following tools are installed as part of the extension:</p> <ul style="list-style-type: none"> • SapMachine 11 • SAP JVM 8 • Maven V 3.8.1 • Tomcat V 9.0.33 <p>You can configure the Java version to either JavaSE-11 or JavaSE-1.8.</p> <p>To set the default Java version, enter the following command:</p> <pre>Java: Set Default JDK</pre> <p>If you only work with source files and don't use a build tool, the appropriate runtime is set based on the default Java version you defined.</p> <p>See Language support for Java™ for Visual Studio Code, Debugger for Java, Spring Boot tools, Java Test Runner, and Project Manager for Java.</p> <p>i Note</p> <p>Not all the features described in the extension documentation are supported.</p>
Launchpad Module	<p>Allows you to add a launchpad to your multitarget application.</p> <p>See Basic Development Flow in SAP Business Application Studio.</p>
MTA Tools	<p>Allows you to create and develop multitarget applications.</p> <p>See MTA Tools.</p>
SAPUI5 Adaptation Project	<p>SAPUI5 Adaptation Project allows developers to extend SAP Fiori applications in SAP Business Application Studio.</p> <p>See Extending an SAP Fiori Application.</p>
SAPUI5 Layout Editor & Extensibility	<p>Allows you to visually develop your XML view and extend an existing SAPUI5 application that resides in the SAPUI5 ABAP repository.</p> <p>See Working with the Layout Editor and Extend SAPUI5 Applications.</p>

Extending SAP Business Application Studio

Enrich the IDE with additional features and capabilities to make your development more efficient.

i Note

This feature is not available in the China (Shanghai) region.

The SAP Business Application Studio extension framework allows you to add new project and module templates to ease project creation. You can enrich the IDE with tools that will help you develop faster and more efficiently, such as code assist, static code

analysis, and code formatting. Likewise, you can integrate your IDE with external services and systems.

The extension framework allows you to extend SAP Business Application Studio in 2 different ways:

- Extend a specific dev space with **VS Code extensions and Yeoman generators**.
 - Search the Open VSX Registry for additional VS Code extensions to install directly on your dev space.
See [Explore and Install VS Code Extensions](#).
 - Search and install open source generators to add the most suitable templates for your wizards.
See [Explore and Install Generators](#).
- Create your own SAP Business Application Studio extension.
 - Package VS Code extensions and Yeoman generators into an SAP Business Application Studio extension and then deploy it to the subaccount in which your team is working. All the team members can then enable the extension from the Dev Space Manager.
See [Create and Deploy an SAP Business Application Studio Extension](#).

Explore and Install VS Code Extensions

You can install VS Code extensions from the [Open VSX Registry](#) to get additional tools to support the development activities in your dev space.

i Note

SAP provides you with a mechanism to access third-party sites to view and download open-source, 3rd party, or its own tools, libraries, or software components (“Extensions”) to dev spaces in SAP Business Application Studio. Using this mechanism, you can view and install VS Code Extensions from the Open VSX Registry at your own risk.

SAP does not certify or endorse any of the third-party sites or Extensions, and they are not part of SAP Business Application Studio.

You must ensure that you have and maintain all the necessary rights to use these Extensions.

You are responsible for all aspects of the Extensions, including maintenance, management, security, and support. SAP Business Application Studio does not support the auto-update feature for these extensions.

You will assume all responsibility for any negative effects caused by or relating to the Extensions.

SAP may elect, in its sole discretion, to disable any dev space that includes Extensions that cause system malfunction or that SAP reasonably believes may cause harm to SAP systems.

To install an extension:

1. Click  (Extensions) from the activity bar or select **View > Extensions** from the left-side menu.
2. The first time you open this view, a disclaimer is displayed. Click **OK** to open the **Extensions** view. To read it again later, click **Show Disclaimer**.

The **Extensions** view includes the following sections:

- Search box - Explore the extensions in the [Open VSX Registry](#). You can see the relevant extensions together with their short descriptions. Double-clicking on an extension opens the extension page with the full details. To

clear the search results, click .

- **Dev Space - Installed** - Shows the list of extensions you have installed in your dev space. You can uninstall extensions from here.

3. Use the Search box to find the extension you want, and click **Install**.

To uninstall an extension:

1. Search for the extension using the Search box or in the **Dev Space - Installed** section.
2. Click **Uninstall** from the Manage button context menu.

To update an extension:

1. Search for the extension using the Search box or in the **Dev Space - Installed** section.
2. Click **Uninstall** from the Manage button context menu.
3. Click **Install**.

Explore and Install Generators

Use external open source generators to add the most suitable templates for your wizards.

i Note

SAP provides you with a mechanism to access third-party sites to view and download open-source, 3rd party, or its own tools, libraries, or software components (“Extensions”) to dev spaces in SAP Business Application Studio.

Using this mechanism, you can view and install Yeoman Generators from the public npm registry at your own risk.

SAP does not certify or endorse any of the third-party sites or Extensions, and they are not part of SAP Business Application Studio. You must ensure that you have and maintain all the necessary rights to use these Extensions. You are responsible for all aspects of the Extensions, including maintenance, management, security, and support. You will assume all responsibility for any negative effects caused by or relating to the Extensions.

SAP may elect, in its sole discretion, to disable any dev space that includes Extensions that cause system malfunction or that SAP reasonably believes may cause harm to SAP systems.

1. Click **Explore and Install Generators** from the upper-right corner of the Template wizard or enter **Explore and Install Generators** in the command palette.

The **Explore and Install Generators** tool opens in a new tab.

2. The first time you access the tool, a disclaimer is displayed. Click **OK** to continue.

The generators from the [npm registry](#) are displayed.

3. In the **Search for Generators** field, enter the desired template type (for example SAP Fiori or SAP HANA).

4. Scroll down to find the relevant generator.

5. Click **Install**. The generator is added to your machine and can now be selected from the [Template Wizard](#).

Create and Deploy an SAP Business Application Studio Extension

Create an SAP Business Application Studio extension that includes VS Code extensions and Yeoman generators and deploy it to your subaccount.

Prerequisites

- You must have the [Extension deployer](#) role. See [Manage Authorizations](#).
- You must enable the **SAP Business Application Studio Extension Development** additional extension in your dev space. See [Working in the Dev Space Manager](#).

To create an SAP Business Application Studio extension:

1. In your workspace, create an extension definition file called `extension.json` with the following content.

i Note

Make sure to replace the placeholders in the file with the relevant information.

The extension definition file includes two main parts:

- The extension metadata
- The list of components that are part of the extension: VS Code extensions, Yeoman generators

i Note

You must include at least one of these components in the file.

Sample Code

```
{
  "apiVersion": "1",
  "name": "<technical name>",
  "namespace": "ext-<subdomain - where <subdomain> is the subdomain of the subaccount of the account>",
  "about": {
    "description": "<description>",
    "author": "<author>",
    "tagline": "<the extension name displayed in the dev space manager>",
    "thumbnail": "<thumbnail - The thumbnail must be a base64 encoded SVG>"
  },
  "version": "<version>",
  "yeomanPackages": [
    {
      "name": "<package name>",
      "versionRange": "<package version>"
    }
  ],
  "vscodeExtensions": [
    {
      "source": "url",
      "uri": "<the url to the .vsix file>"
    }
  ]
}
```

2. Open a terminal and run the following command to deploy the extension to the subaccount:

```
wex deploy
```

3. Go to the Dev Space Manager to verify that the SAP Business Application Studio extension you created is visible as an additional extension. All developers working on the subaccount to which you deployed can enable this extension from their Dev Space Manager.

To delete the extension:

1. Open a terminal and run the following command:

```
wex delete -x <namespace>/<ext-name>
```

i Note

Deletion of an extension is only possible if the extension is not being used by any dev space.

Working in SAP Business Application Studio

SAP Business Application Studio provides the features needed for the entire life cycle of your application, from the moment you create the project until it is ready to be deployed.

[Get Started](#)

Get started with SAP Business Application Studio.

[Explore Services Using the Service Center](#)

The Service Center provides a central entry point to explore services from various service providers.

[Create a Project](#)

You can create a project from scratch using the project wizard, you can clone a project, or you can import an already existing project to your workspace.

[Develop](#)

SAP Business Application Studio provides you with the tools you require for making your development experience more efficient and productive.

[Test and Run](#)

Once you have finished coding, you can test and run your application.

[Build and Deploy](#)

Use our dedicated tools to build and deploy your application.

[Develop an App Using Different Subaccounts](#)

You can develop your application with different subaccounts. You use one subaccount to create and run your application in SAP Business Application Studio. You use the other subaccount, in a different region, to deploy your application to Cloud Foundry.

[Extend SAPUI5 Applications](#)

You can extend SAPUI5 applications that reside remotely on the on-premise SAPUI5 ABAP repository.

Get Started

Get started with SAP Business Application Studio.

This section describes the steps to take when you open your dev space for the first time.

[Get Started Page](#)

The **Get Started** page provides you contextual links useful to users at the beginning of their development cycle.

[Accessing On Premise Systems](#)

You can access SAP ABAP or other on-premise systems using a built-in Web Proxy.

Get Started Page

The **Get Started** page provides you contextual links useful to users at the beginning of their development cycle.

The **Get Started** page is displayed when you open your dev space or enter `Get Started` in the [command palette](#).

It includes the following sections:

- Quick access to common activities that are relevant for your dev space
- Links to the documentation
- Sample applications relevant for your dev space

Accessing On Premise Systems

You can access SAP ABAP or other on-premise systems using a built-in Web Proxy.

Your dev space includes a built-in Web Proxy (`http://localhost:8887`) that allows you access to on-premise systems. It is already configured with the `HTTP_PROXY` and the `HTTPS_PROXY` environment variables.

The proxy requires destination configuration to your on-premise system from your Cloud Foundry subaccount.

For more information, see [Connecting to External Systems](#).

Defining On Premise Systems for the Web Proxy

1. Your administrator must create a destination and configure the [Cloud Connector](#) so that as a developer, you can access on-premise systems.
2. To update your dev space with a destination created after your dev space was started, open your dev space terminal and execute the following command:

```
curl http://localhost:8887/reload
```

This will trigger an immediate update of your on-premise destinations used by the dev space Web Proxy.

3. Use the same URL that's in the destination from your dev space. The proxy will pass your request through the destination.

Using Git On Premise Repositories

You can work with on-premise Git repositories once an appropriate destination has been created in your subaccount. Make sure to use the exact same host and port as defined in the destination URL property.

For more information, see [Connecting to a Corporate Git Repository](#).

Using NPM Modules from On Premise Repositories

You can use npm modules from an on-premise npm repository or an on-premise Git repository.

Use standard npm registry configurations to set the repository URL.

For example:

```
npm config set @<scope>:registry <URL>
```

Make sure an appropriate destination has been created in your subaccount and that you are using the exact same host and port as defined in the destination URL property.

Using Java Modules from On Premise Repositories

You can use Java modules as dependencies to your Java projects from an on-premise Maven repository.

Edit the standard Maven settings file (open file /home/user/.m2/settings.xml) to add the repository URL.

For example:

```
<repositories>
  ...
  <repository>
    <id>corporate.repository</id>
    <url>PUT YOUR FULL REPOSITORY URL HERE</url>
  </repository>
  ...
</repositories>
```

Make sure an appropriate destination has been created in your subaccount and that you are using the exact same host and port as defined in the destination URL property.

Explore Services Using the Service Center

The Service Center provides a central entry point to explore services from various service providers.

You can use the services as data sources in your application and you can trigger application development from the Service Center.

To explore services, click  (Service Center) from the activity bar or select   from the left-side menu, and enter **Service Center** in the input field.

The Service Center opens with the various service providers displayed, including the [SAP System Service Provider](#), the [SAP API Business Hub Service Provider](#), the [API Business Hub Enterprise Service Provider](#), and the [Unified Customer Landscape Service Provider](#).

You can hide or display each service provider in the file explorer. Right-click **Service Center** and select or clear the service provider.

SAP System Service Provider

The SAP System service provider includes systems from your SAP Business Application Studio subaccount. You can use the services as data sources in your application or for application development.

Login occurs automatically, using the SAP Business Application Studio user credentials.

Explore SAP System Services

1. Click the gray arrow to display the SAP Business Application Studio subaccount's destinations ().
2. Click the system () to see the system properties, including the name, description, URL, authentication type, and status.

There are different types of systems displayed using the SAP Business Application Studio subaccount's destinations:

- o ABAP Service Catalog

The destination points to the ABAP system directly. The system shows its service catalogs with a list of services (V2 and V4, for example). To see the list of services, click the system and log in with your user credentials, if needed.

If the service catalog is available and connected (, ) , you can search for services within it. Click the search icon () and select the relevant service from the command palette.

- o Service Host

The destination points to a host. To log in, enter the service path and your credentials, if needed, and click **CONNECT**.

- o Service URL

The destination points directly to the service.

- o Cloud for Customer Catalog

The destination points to the SAP Cloud for Customer system directly. The system shows its service catalog with a list of services (V2). To see the list of services, click the system and log in with your user credentials, if needed.

If the service catalog is available and connected () , you can search for services within it. Click the search icon () and select the relevant service from the command palette.

If you maintain credentials in the destination configuration of the account, login can occur automatically. If a system is available, the icon has a green dot ().

If you don't maintain the credentials in the destination configuration of the account, you need to log in manually to open the system information.

3. Click the gray arrow to display the list of services.

4. Click a service () to see its properties, including the service name, URL, and status.

If a service is available, the icon has a green dot ().

5. Click an entity to see the service details, including entity data and live data:

a. You can see the entity's metadata from the **Entity Details** tab.

b. You can see a preview of the live production data associated with the entity set from the **Live Data** tab.

This helps you choose an entity for your application.

Note

The live data only displays:

- Up to 20 rows of data
- Data for simple data types

6. You can click **View Diagram** to see the service entities, their properties, and the relationships between the entities in a new tab.

Service Actions for Development

Create a Project from a Service

1. Click **Service Actions > Create Project from Service**.

The template wizard displays the projects that you can create from a service. For example, an HTML5 project or an SAP Fiori application. See [Create an HTML5 Project](#) or [SAP Fiori Elements](#) for more information.

2. Use the template wizard to create the relevant project.

Add an External Data Model to a CAP Project

You can select a service from the Service Center and add it as an external data model to a CAP Node project:

1. Open a service and click **Service Actions > Add External Data Model to CAP Project**.

2. Select the target CAP Node project to add the external data model to.

3. (Optional) You can generate a sample service and select the relevant entities.

a. Select **Yes** to add a sample service.

b. Select the entities that you want to add.

4. Click **Add**.

You added the external data model to the CAP project. The following changes happen:

- The <service_name>.xml and <service_name>.cds files appear in the  external  folder of the project.
- A service section appears in the package .json file of the CAP project, which refers to the  external  <service_name>.xml file. This file has the metadata of the service:

```
"<service_name>": {
  "kind": "odata",
  "model": "srv/external/<service_name>"
  "credentials": {
    "destination": "<service_name>"
  }
}
```

- If you added a sample service with the relevant entities, the <service_name>.cds and the <service_name>.js files appear in the  external  folder of the CAP project.

Add a System

You can add a new system to your SAP Business Application Studio subaccount:

Note

- If your account isn't a trial account, make sure that the **Business_Application_Studio_Administrator** role is assigned to you in the cockpit. See [Manage Authorizations and Roles](#).
- If you're adding a system based on an ABAP Service Catalog, the following prerequisites apply:
 - For SAP S/4HANA on-premise, SAP ERP, or another on-premise ABAP, make sure that the Cloud Connector is set up. See this [blog post](#) (under the **Create a Data Source (Destination)** heading in the **Service Catalog** section).
 - For SAP S/4HANA Cloud or the SAP BTP ABAP environment, which both use SAML Bearer Assertion authentication, see [Create a Destination to Connect to SAP Business Application Studio](#).

1. Click the relevant button to add a system:

- If you are adding a system for the first time, click **Add System**.
- If you already have a system, hover over the subaccount and click  (Add system).

A new tab opens.

2. Enter the system name and URL and select the system type, proxy, authentication method, and product, if needed.

Note

You can select **Basic Authentication** and enter the username and password for your system. This configuration enables you to view the system information without needing to log in each time.

3. Click **Add**.

SAP API Business Hub Service Provider

The SAP API Business Hub service provider includes SAP API Business Hub products, packages, and services. You can use the services as data sources in your application or for application development.

Note

This is custom documentation. For more information, please visit the [SAP Help Portal](#)

The Service Center only shows SAP API Business Hub products and packages with OData services.

Explore SAP API Business Hub Services

- From the Service Center, click the gray arrow to display the SAP API Business Hub products:

SAP S/4HANA Cloud, SAP S/4HANA, SAP SuccessFactors, SAP Customer Experience, and SAP Business Technology Platform

- Click the gray arrow next to the product () to display the packages.

If the package is available and connected (), you can search for services within it. Click the search icon () and select the relevant service from the command palette.

- Click the gray arrow next to the package () to display the services (APIs).

- Click a service () and log in with your SAP API Business Hub credentials, if needed.

Note

You must log in with your SAP API Business Hub credentials one time at the beginning of your session.

After you log in to a service, the icon has a green dot ().

The service editor displays the service's properties, including the service name, protocol, status, and product.

You can navigate to the API package by clicking .

You can also navigate to the service in the SAP API Business Hub by clicking the URL. From the SAP API Business Hub, you can click **Try Out** to test the API in the sandbox environment.

- Click an entity to see the service details, including entity data and live data:

- You can see the entity's metadata from the **Entity Details** tab.
- You can see a preview of the live production data associated with the entity set from the **Live Data** tab.

This helps you choose an entity for your application.

Note

The live data only displays:

- Up to 20 rows of data
- Data for simple data types

- You can click **View Diagram** to see the service entities, their properties, and the relationships between the entities in a new tab.

Service Actions for Development

Create a Project from a Service

- Click **Service Actions** **Create Project from Service** .

The template wizard displays the projects that you can create from a service. For example, an HTML5 project or an SAP Fiori application. See [Create an HTML5 Project](#) or [SAP Fiori Elements](#) for more information.

- Use the template wizard to create the relevant project.

i Note

To run your project with the SAP API Business Hub sandbox, see the prerequisites in [Developing an HTML5 Application for Cloud Foundry](#).

Add an External Data Model to a CAP Project

You can select a service from the Service Center and add it as an external data model to a CAP Node project:

1. Open a service and click **Add External Data Model to CAP Project**.
2. Select the target CAP Node project to add the external data model to.
3. (Optional) You can generate a sample service and select the relevant entities.
 - a. Select **Yes** to add a sample service.
 - b. Select the entities that you want to add.
4. Click **Add**.

You added the external data model to the CAP project. The following changes happen:

- o The `<service_name>.xml` and `<service_name>.cds` files appear in the **external** folder of the project.
- o A service section appears in the package `.json` file of the CAP project, which refers to the **external** `<service_name>.xml` file. This file has the metadata of the service:


```
"<service_name>": {
    "kind": "odata",
    "model": "srv/external/<service_name>"
  "credentials": {
    "destination": "<service_name>""
  }
}
```
- o If you added a sample service with the relevant entities, the `<service_name>.cds` and the `<service_name>.js` files appear in the **external** folder of the CAP project.

API Business Hub Enterprise Service Provider

The API business hub enterprise service provider offers products and services that are published in the API business hub enterprise. You can use the services as data sources in your application or for application development.

Prerequisite

You created a service instance in the API business hub enterprise. See [Creating a Service Instance in the API Management, API business hub enterprise](#).

Add a System

You can add a new system, referring to the API business hub enterprise instance, from the SAP BTP cockpit in the SAP Business Application Studio subaccount. This destination will be used **to register new developers to API business hub enterprise and to subscribe them to products**.

1. Create a destination in your SAP Business Application Studio subaccount from the cockpit with the following fields:

Property	Value
Name	Provide a name for the system.
Type	HTTP
URL	<p>Use the <code>url</code> value from the service key of the API business hub enterprise instance.</p> <p>You can find the service key for the service instance that you created (in the Prerequisite) in the SAP BTP cockpit, under the API Management, API Business Hub Enterprise service.</p>  <pre> key Form JSON 1 ↴ { 2 "url": "https://apihub-enterprise.sap.com", 3 "clientId": "XXXXXXXXXX", 4 "clientSecret": "XXXXXXXXXX", 5 "tokenUrl": "https://token/apihub-enterprise.sap.com" 6 } </pre>
Proxy Type	Internet
Authentication	OAuth2ClientCredentials
Client ID	Use the <code>clientId</code> value from the service key of the API business hub enterprise instance.
Client Secret	Use the <code>clientSecret</code> value from the service key of the API business hub enterprise instance.
Token Service URL	Use the <code>tokenUrl</code> value from the service key of the API business hub enterprise instance.

2. In the **Additional Properties** section, configure the following:

Property	Value
<code>HTML5.DynamicDestination</code>	true
<code>WebIDEEnabled</code>	true
<code>WebIDEUsage</code>	apihub_enterprise

Property	Value								
apiBusinessHubEnterpriseURL	<p>Adding this property is optional.</p> <p>This property enables navigation from the Service Center to the API business hub enterprise.</p> <p>Use the following format:</p> <pre><subscribed subaccount name>.<devportal_url>.cfapps.<region>.hana.ondemand.com</pre> <p>Replace the placeholders with the following information:</p> <table border="1"> <thead> <tr> <th>Property</th><th>Value</th></tr> </thead> <tbody> <tr> <td>subscribed subaccount name</td><td> <p>Use the first part of the tokenUrl from the destination system of API business hub enterprise.</p> <p>For example, if the URL is https://abcd123trial.authentication.eu10.hana.ondemand.com/oauth/token Use abcd123trial for the subscribed subaccount name.</p> </td></tr> <tr> <td>devportal_url</td><td> <ul style="list-style-type: none"> ◦ For trial, use integrationsuitetrial-devportal ◦ For production, use apibhubenterprise </td></tr> <tr> <td>region</td><td> <p>Find it in the tokenUrl.</p> <p>For example, if the tokenUrl is https://abcd123trial.authentication.eu10.hana.ondemand.com/oauth/token The region is eu10.</p> </td></tr> </tbody> </table>	Property	Value	subscribed subaccount name	<p>Use the first part of the tokenUrl from the destination system of API business hub enterprise.</p> <p>For example, if the URL is https://abcd123trial.authentication.eu10.hana.ondemand.com/oauth/token Use abcd123trial for the subscribed subaccount name.</p>	devportal_url	<ul style="list-style-type: none"> ◦ For trial, use integrationsuitetrial-devportal ◦ For production, use apibhubenterprise 	region	<p>Find it in the tokenUrl.</p> <p>For example, if the tokenUrl is https://abcd123trial.authentication.eu10.hana.ondemand.com/oauth/token The region is eu10.</p>
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devportal_url	<ul style="list-style-type: none"> ◦ For trial, use integrationsuitetrial-devportal ◦ For production, use apibhubenterprise 								
region	<p>Find it in the tokenUrl.</p> <p>For example, if the tokenUrl is https://abcd123trial.authentication.eu10.hana.ondemand.com/oauth/token The region is eu10.</p>								

Explore API Business Hub Enterprise Services

i Note

The Service Center only shows API business hub enterprise systems and products with OData services.

1. From the Service Center, click the gray arrow to display the API business hub enterprise systems.

Each system points to an API business hub enterprise instance.

2. Click the gray arrow next to the system (📁) to display the products within it.

Multiple APIs are grouped into a product.

If the product is available and connected (🟢), you can search for services within it. Click the search icon (🔍) and select the relevant service from the command palette.

3. Click the gray arrow next to the products (📁) to display the services (APIs).

If the product is available, the icon has a green dot (🟢).

4. Click a service (📦) to see its properties, including the service name, protocol, and status.

To see the service details, you must be onboarded to the API business hub enterprise and subscribed to the selected product:

- If you aren't onboarded to the API business hub enterprise, enter your first name, last name, and subscription name and click **Subscribe**.

You're now subscribed to the product and all services associated with it.

- o If you're onboarded to the API business hub enterprise, but you aren't subscribed to the product, enter a subscription name and click **Subscribe**.

You can now access the service.

After you're subscribed to the selected product, you'll see the following information:

- o Subscription details

This section includes a link to the product in the API business hub enterprise, the subscription name with a link to the subscription in the API business hub enterprise, and the subscription date.

- o Service properties

This section includes the service name, protocol, and status.

If a service is available, the icon has a green dot ().

i Note

- o If a service is unavailable and the target endpoint of the service requires authentication, make sure that the target endpoint is configured to be authenticated via [Basic Authentication](#). See the "Configure API Management to Use the Basic Authentication Policy" section in this [blog post](#).
- o It is recommended to use the [verify API key](#) policy to ensure secure access to the service. This policy is added in the PreFlow of the ProxyEndpoint of the corresponding API proxy.

5. Click an entity to see the service details, including entity data and live data:

- a. You can see the entity's metadata from the [Entity Details](#) tab.
- b. You can see a preview of the live production data associated with the entity set from the [Live Data](#) tab.

This helps you choose an entity for your application.

i Note

The live data only displays:

- Up to 20 rows of data
- Data for simple data types

6. You can click [View Diagram](#) to see the service entities, their properties, and the relationships between the entities in a new tab.

Service Actions for Development

If the SAP Business Application Studio Administrator role is assigned to you, after creating a project or adding a data model, the destination to the selected product subscription is generated in the SAP BTP cockpit. The destination enables you to preview live data and run your deployed application. The destination includes information about the product subscription, including the subscription's API key and the subscription's ID.

If you don't have the SAP Business Application Studio Administrator role, the destination isn't generated with your subscription.

Create a Project from a Service

1. Click  .

The template wizard displays the projects that you can create from a service. For example, an HTML5 project or an SAP Fiori application. See [Create an HTML5 Project](#) or [SAP Fiori Elements](#) for more information.

2. Use the template wizard to create the relevant project.

i Note

If the deployed application to Cloud Foundry fails to bring data from the service, make sure that the [Assign Message](#) policy is used in the PreFlow of the ProxyEndpoint of the API proxy.

We use the Assign Message policy to override the HTTP request Accept-Encoding header:

```
<!-- This policy can be used to create or modify the standard HTTP request and response messages
<AssignMessage async="false" continueOnError="false" enabled="true" xmlns='http://www.sap.com/ap:

<!-- Sets a new value to the existing parameter -->
<Set>
  <Headers>
    <Header name="Accept-Encoding">identity</Header>
  </Headers>
</Set>
<IgnoreUnresolvedVariables>false</IgnoreUnresolvedVariables>
<AssignTo createNew="false" type="request"></AssignTo>
</AssignMessage>
```

Add an External Data Model to a CAP Project

You can select a service from the Service Center and add it as an external data model to a CAP Node project:

1. Open a service and click **Add External Data Model to CAP Project**.
2. Select the target CAP Node project to add the external data model to.
3. (Optional) You can generate a sample service and select the relevant entities.
 - a. Select **Yes** to add a sample service.
 - b. Select the entities that you want to add.
4. Click **Add**.

You added the external data model to the CAP project. The following changes happen:

- o The `<service_name>.xml` and `<service_name>.cds` files appear in the **external** folder of the project.
- o A service section appears in the package `.json` file of the CAP project, which refers to the **external** `<service_name>.xml` file. This file has the metadata of the service:

```
"<service_name>": {
  "kind": "odata",
  "model": "srv/external/<service_name>"
  "credentials": {
    "destination": "<service_name>"
  }
}
```

- If you added a sample service with the relevant entities, the <service_name>.cds and the <service_name>.js files appear in the **external** folder of the CAP project.

Unified Customer Landscape Service Provider

The Unified Customer Landscape service provider includes packages and services from registered SAP S/4HANA Cloud systems in SAP BTP. You can use the services as data sources in your application or for application development.

Prerequisites

- Your administrator registered an SAP S/4HANA Cloud system in an SAP BTP global account.

See [Enabling System Landscape for SAP Business Application Studio](#).

- Your administrator created a **Developing with SAP Business Application Studio** formation type in the SAP BTP cockpit to assign the SAP S/4HANA Cloud system to an SAP Business Application Studio subaccount.
- You created a destination in your SAP Business Application Studio subaccount for each consumption bundle from the SAP BTP cockpit with the following fields:

Property	Value
Name	Provide a name of your choice.
Type	HTTP
URL	Enter the URL of the SAP S/4HANA Cloud target system. This value is displayed in the System Details field in the SAP BTP cockpit. i Note You must be a global account administrator to see the System Landscape .
Proxy Type	Internet
Authentication	Select the authentication based on your SAP S/4HANA Cloud system inbound communication settings.

In the **Additional Properties** section, you configured the following:

Property	Value
HTML5.DynamicDestination	true
WebIDEEnabled	true
x-system-type	SAP S/4HANA Cloud This value is displayed in the System Details field in the SAP BTP cockpit.

Property	Value
x-correlation-id	sap.s4:communicationScenario:SAP_COM_<XXXX> Replace the number based on the relevant com_scenario for the destination. This value is displayed in the System Landscape System Details Consumption Bundles Correlation IDs column in the SAP BTP cockpit.
x-system-id	Enter the name of the system ID. This value is displayed in the System Landscape System Details System ID field in the SAP BTP cockpit.

Explore Unified Customer Landscape Services

1. Click the gray arrow to display the available systems () for the account.

2. Click the gray arrow to display the packages () under a system.

If the package is available and connected (, you can search for services within it. Click the search icon () and select the relevant service from the command palette.

3. Click the gray arrow to display the services under a package.

4. Click a service () to see its properties, including the service name, protocol, version, URL, and status.

If there are many destinations available for the Unified Customer Landscape service, you can see the [Connectivity Information](#) for the specific destination that you're exploring. You can see the destination's name, authentication, proxy, consumption bundle name and ID, and correlation ID.

If a service is available, the icon has a green dot (.

5. Click an entity to see the service details, including entity data and live data:

a. You can see the entity's metadata from the [Entity Details](#) tab.

b. You can see a preview of the live production data associated with the entity set from the [Live Data](#) tab.

This helps you choose an entity for your application.

i Note

The live data only displays:

- Up to 20 rows of data
- Data for simple data types

6. You can click [View Diagram](#) to see the service entities, their properties, and the relationships between the entities in a new tab.

Service Actions for Development

Create a Project from a Service

1. Click [Service Actions](#) [Create Project from Service](#).

The template wizard displays the projects that you can create from a service. For example, an HTML5 project or an SAP Fiori application. See [Create an HTML5 Project](#) or [SAP Fiori Elements](#) for more information.

2. Use the template wizard to create the relevant project.

Add an External Data Model to a CAP Project

You can select a service from the Service Center and add it as an external data model to a CAP Node project:

1. Open a service and click **Add External Data Model to CAP Project**.
2. Select the target CAP Node project to add the external data model to.
3. (Optional) You can generate a sample service and select the relevant entities.
 - a. Select **Yes** to add a sample service.
 - b. Select the entities that you want to add.
4. Click **Add**.

You added the external data model to the CAP project. The following changes happen:

- The `<service_name>.xml` and `<service_name>.cds` files appear in the **external** folder of the project.
- A service section appears in the package `.json` file of the CAP project, which refers to the `external` file. This file has the metadata of the service:


```
"<service_name>": {
    "kind": "odata",
    "model": "srv/external/<service_name>"
    "credentials": {
        "destination": "<service_name>"
    }
}
```
- If you added a sample service with the relevant entities, the `<service_name>.cds` and the `<service_name>.js` files appear in the **external** folder of the CAP project.

Create a Project

You can create a project from scratch using the project wizard, you can clone a project, or you can import an already existing project to your workspace.

Note

It is recommended to always connect your projects to a Git repository for long-term persistency. See [Connect to Your Git Source Control System](#).

[Creating a Project Using the Wizard](#)

You can create projects based on your development scenario and the extensions installed in the dev space using predefined templates.

[Creating a Project from the Terminal](#)

You can create projects based on your development scenario and the extensions installed in the dev space using the terminal.

[Cloning Repositories](#)

Add an existing project to your local workspace by cloning its repository from Git.

[Importing Projects](#)

Import projects from your local file system to SAP Business Application Studio.

[Project Visibility in SAP Business Application Studio](#)

Projects are displayed in the file explorer within a workspace or as stand-alone folders.

[Template Wizard](#)

SAP Business Application Studio allows you to use any type of Yeoman generator including project and module generators.

Creating a Project Using the Wizard

You can create projects based on your development scenario and the extensions installed in the dev space using predefined templates.

1. Open the wizard in one of the following ways:

- From the left-side menu, select  **File**  **New Project from Template**.
- Select **Start from template** from the **Get Started** page.
- Enter **New Project** in the command palette and select **SAP Business Application Studio: New Project from Template**.

The Project Wizard opens showing the project templates that are relevant based on the dev space and additional extensions that you selected.

2. Follow the wizard steps and provide the required information. You can move between steps using the **Back** and **Next** buttons or clicking the steps from the wizard tree.

The wizard displays error notifications on the field level and on the step level.

The project is added to your dev space in a new workspace or as part or a multi-root workspace depending on the Workspace preferences that you defined.

The wizard generates the project including the relevant folder structure, artifacts, and resources.

Creating a Project from the Terminal

You can create projects based on your development scenario and the extensions installed in the dev space using the terminal.

1. To open the terminal, select  **Terminal**  **New Terminal** from the left-side menu.
2. Enter yo in the terminal.
3. Select the relevant project type from the list, such as **Fiori Project** or **Basic Multitarget Application**.
4. Answer the questions according to the type of application that you want to create.

Related Information

[Terminal](#)

Cloning Repositories

Add an existing project to your local workspace by cloning its repository from Git.

Use the Terminal to Clone a Repository

1. Open a terminal.
2. Change the current working directory to the location where you want the cloned directory.
3. Type `git clone`, and then paste your URL.

For example:

Sample Code

```
$ git clone https://github.com/YOUR-USERNAME/YOUR-REPOSITORY
```

Use the Command Palette to Clone a Repository

1. Open the [Command Palette](#).
2. Enter **Git: Clone** in the input field and press **Enter**.
3. Enter the repository URL and press **Enter**.
4. Select the folder into which you want to clone the repository and click **Select Repository Location**.
5. If prompted, enter your credentials in the input field.

Importing Projects

Import projects from your local file system to SAP Business Application Studio.

If you have an SAP Web IDE project or a project you worked on in another IDE, you can save it as a ZIP or a TAR file and import it to SAP Business Application Studio.

1. Make sure there is an open workspace in your dev space. If there is no open workspace:
 - a. Click **Open Folder**.
 - b. Select **projects** from the list provided in the command palette.
 - c. Click **OK**.
2. From the **Get Started** page, click **Import**, or select **SAP Business Application Studio: Import Project** from the command palette.
3. Select the desired ZIP or TAR file.
4. Click **Open**.

The project is added to your dev space in a new workspace or as part of a multi-root workspace depending on the Workspace preferences that you defined.

Project Visibility in SAP Business Application Studio

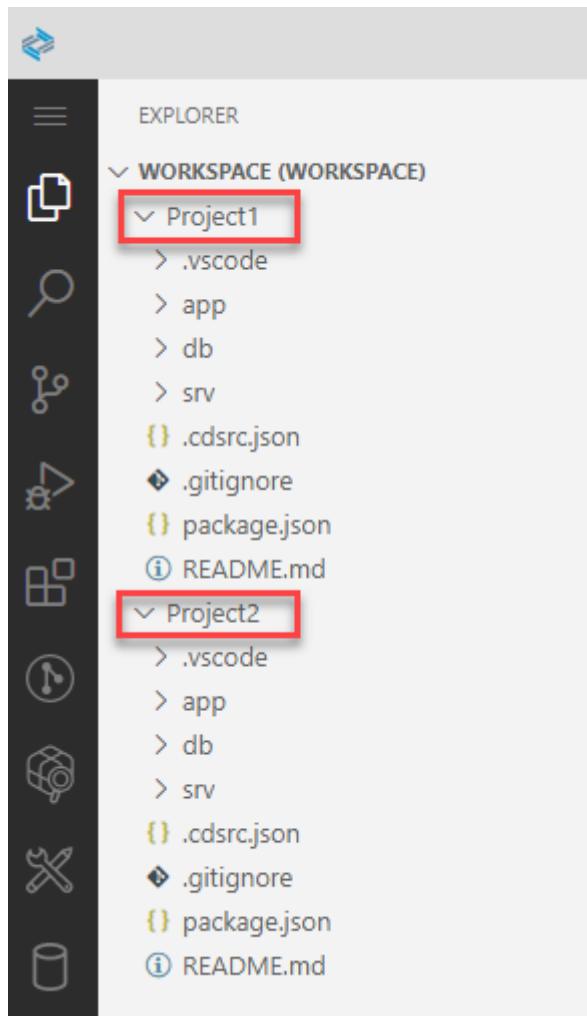
Projects are displayed in the file explorer within a workspace or as stand-alone folders.

A workspace is an entity containing your project's settings, debug configurations, and task configurations.

We recommend you work in an environment where projects reside in a multi-root workspace.

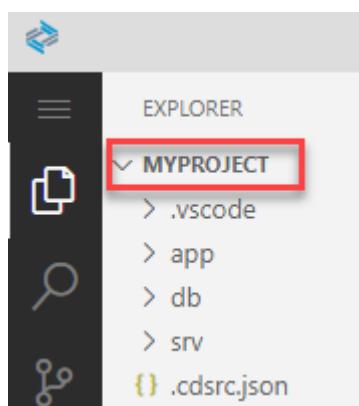
In SAP Business Application Studio, a workspace is created for you as part of the project creation wizard. If a workspace is already open, new projects are added to it by default.

Working in a multi-root workspace environment means that you can group projects that are saved in different locations or even in different workspaces. All project files are visible in the file explorer under the same workspace.



You also have the option to open a project as a stand-alone folder, and not belonging to a workspace.

1. From the left-side menu, select **File > Open Folder...**.
2. Select the desired project and click **Open**. The project opens as the root folder in the file explorer.



Reopening a Workspace

If you already have a workspace in which you want to create your project, click **Open Workspace** in the file explorer or from the left-side menu, select **File > Open Workspace from File...** and select the desired workspace file.

Changing the Default Settings

If you do not want your projects to be opened in a workspace by default, you can change the settings.

1. From the left-side menu, select **File > Preferences > Settings**.
2. From the Settings page, select **Application Wizard**.
3. Under **Workspace**, select the preferred default behavior from the dropdown list.

Template Wizard

SAP Business Application Studio allows you to use any type of Yeoman generator including project and module generators.

i Note

When you create a project using a template, you become the code owner and as such, you are responsible for any updates or fixes that must be performed for it. We recommend you follow the industry best practice of using automated vulnerability scanning in the CI/CD pipeline to avoid supply chain and other cyber-attacks.

1. Enter **Open Template Wizard** in the command palette.

The Template wizard opens showing all the Yeoman generators that are installed in your machine.

2. Follow the wizard steps and provide the required information. You can move between steps using the **Back** and **Next** buttons or clicking the steps from the wizard tree.

The wizard displays error notifications on the field level as well as on the step level.

The artifact is added to your dev space in a new workspace or as part of a multi-root workspace depending on the Workspace preferences that you defined.

If you do not find a wizard that suits your development needs, you can search for more wizards using the [Explore and Install Generators](#) tool.

Develop

SAP Business Application Studio provides you with the tools you require for making your development experience more efficient and productive.

[Guide Center](#)

This tool shows you how to execute common development tasks for specific SAP scenarios.

[Project Explorer](#)

Use the project explorer to browse the contents of your current workspace.

[Git Source Control](#)

SAP Business Application Studio enables you to connect and interact with the Git source control system, letting you connect and interact with remote Git repositories.

[Terminal](#)

Opening the integrated terminal allows you to access the underlying system. The terminal is a convenient tool because you don't need to switch windows or change the state of an existing terminal to perform a quick command-line task.

[Layout Editor](#)

Display the content of an XML view in the layout editor to see it in a way that closely corresponds to how it will appear in your finished application.

Command Palette

The command palette provides access to all the IDE functionality including shortcuts for the most common operations.

Outline View

The Outline view displays a symbol tree of the currently active editor. This view is useful for understanding the structure of a file or for navigating to a specific element in a file.

Problems View

The Problems view displays the coding errors and warnings of all open files in a list. When you click an item from the list, the problematic piece of code is highlighted in the editor.

Search

There are different Search capabilities in SAP Business Application Studio.

Guide Center

This tool shows you how to execute common development tasks for specific SAP scenarios.

The Guide Center tool provides guidance to perform development tasks based on the best practices defined by SAP experts.

The tool presents a set of guides per development scenario. Different guides are displayed depending on the dev space type you selected and the extensions you enabled for it.

Each guide contains a list of steps you have to perform to complete the development task.

Steps contain detailed instructions as well as the option to trigger an action, such as opening the relevant tool required to perform the task in a new tab. For example, you can open the snippet tool to add code into your project, open the Project Creation wizard to create an SAP application, or open documentation in a separate browser window.

To use the Guide Center tool:

1. Open the command palette and enter **Guide Center**. The Guide Center tool opens showing the list of guides available for your dev space.
2. Open each step within the relevant guide and follow the instructions.

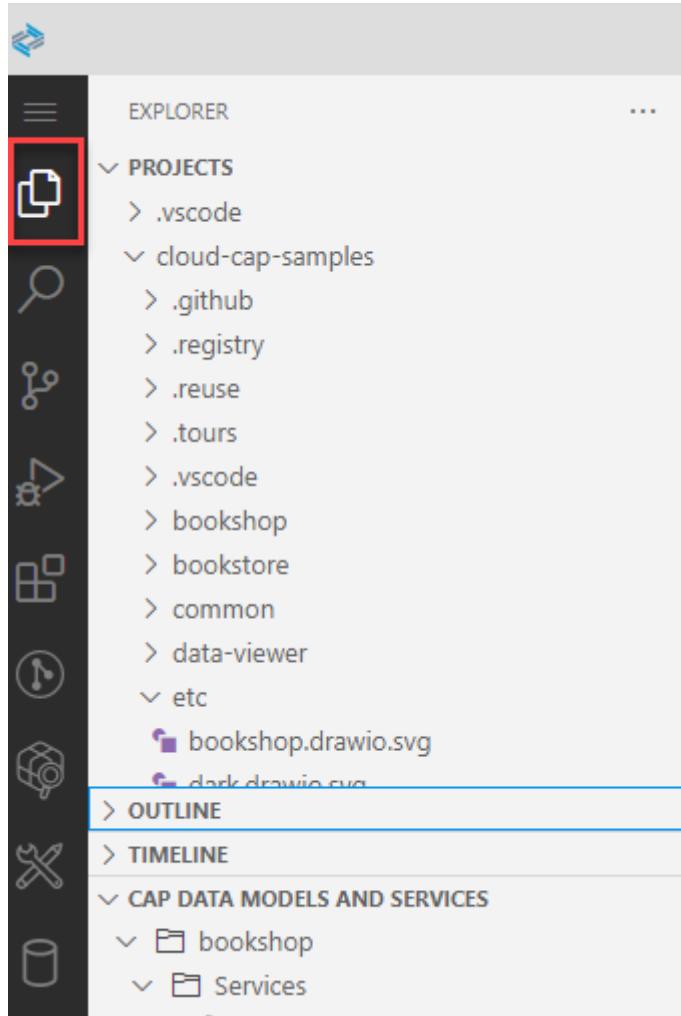
Project Explorer

Use the project explorer to browse the contents of your current workspace.

The project explorer displays application components in a logical view, which simplifies browsing of the contents of your application.

It gives you a bird's-eye view of the components involved in your application at any point in time.

Open the project explorer from the activity bar



Git Source Control

SAP Business Application Studio enables you to connect and interact with the Git source control system, letting you connect and interact with remote Git repositories.

Prerequisite

- Before you can work with the Git view, you or your administrator must establish a connection to your corporate Git system. See [Connect to Your Git Source Control System](#).
- Ask your administrator which is the recommended authentication method for your company. See [Connect to Your Git Source Control System](#).

You can perform all your Git tasks using the terminal, but SAP Business Application Studio allows you to use the the **SIMPLIFIED GIT** view or the **SOURCE CONTROL** view, if you prefer.

Workflow

Using Git is easy. The basic workflow is as follows:

- 1. Clone:** Clone a repository from a remote Git source control system. All the information about the repository is copied, and a local master branch is created and is visible in your workspace. If the remote repository has several branches, you can create additional local branches based on those remote branches.
- 2. Develop:** Once you have the code, you can develop – add files, delete files, modify files. Your changes are visible. When you are ready, you can stage your changes and commit them.

3. **Fetch and Merge/Rebase:** (Optional) Before sending back your changes to the remote repository, you can fetch all the changes made by others. Then you can merge or rebase the changes into your changes to make sure there are no conflicts. If there are conflicts, you can adjust your code.

4. **Push:** Add your changes to the remote repository.

Related Information

[Clone a Repository in the Simplified Git View](#)

[Cloning Repositories](#)

[Connect to a Remote Git Repository](#)

[Connecting an Existing Project to Git](#)

[Using the Simplified Git View](#)

[Using the Advanced Git View](#)

[Connect to Your Git Source Control System](#)

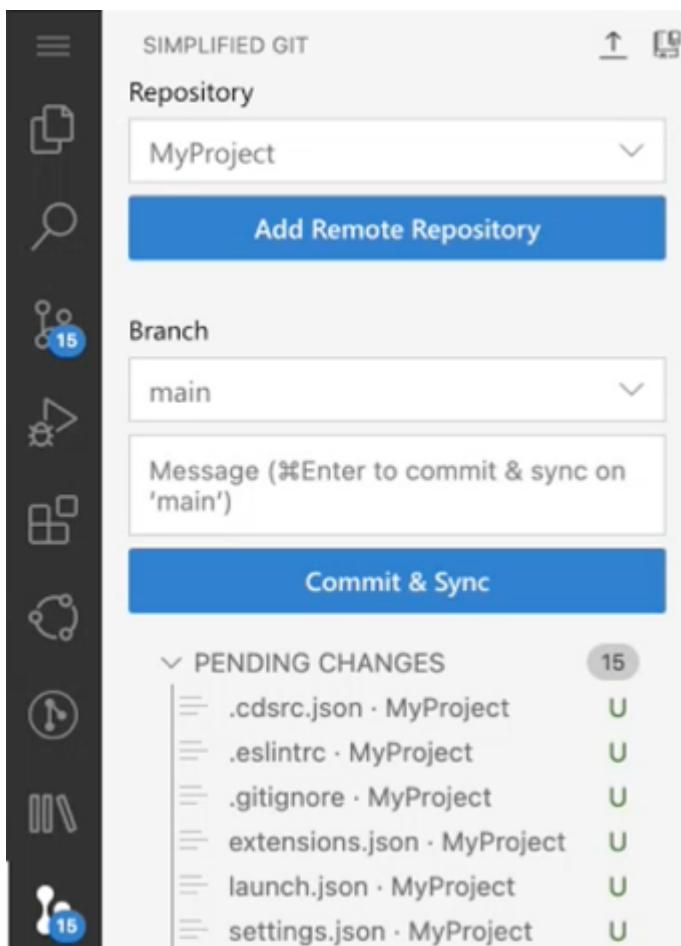
[Connecting to a Public Git Repository](#)

[Troubleshooting](#)

Using the Simplified Git View

Use the **SIMPLIFIED GIT** view to perform Git operations and manage Git repositories in SAP Business Application Studio.

To open the **SIMPLIFIED GIT** view, click  from the activity bar.



The screenshot shows the SAP Business Application Studio interface with the Simplified Git View open. The left sidebar has various icons for file management, search, and other tools. The main area is titled "SIMPLIFIED GIT". It displays a "Repository" section with a dropdown menu showing "MyProject". Below it is a "Branch" section with a dropdown menu showing "main". There is a text input field labeled "Message" with placeholder text "Enter to commit & sync on 'main'". A large blue button labeled "Commit & Sync" is prominently displayed. At the bottom, there is a section titled "PENDING CHANGES" with a badge "15" indicating uncommitted changes. The list includes ".cdsrc.json · MyProject", ".eslintrc · MyProject", ".gitignore · MyProject", "extensions.json · MyProject", "launch.json · MyProject", and "settings.json · MyProject", all marked with a green "U" status indicator.

Connect to a Remote Git Repository

Connect to a remote Git repository to enable contributions from other developers and to track changes in your project.

1. Click  from the activity bar to open the **SIMPLIFIED GIT** view.

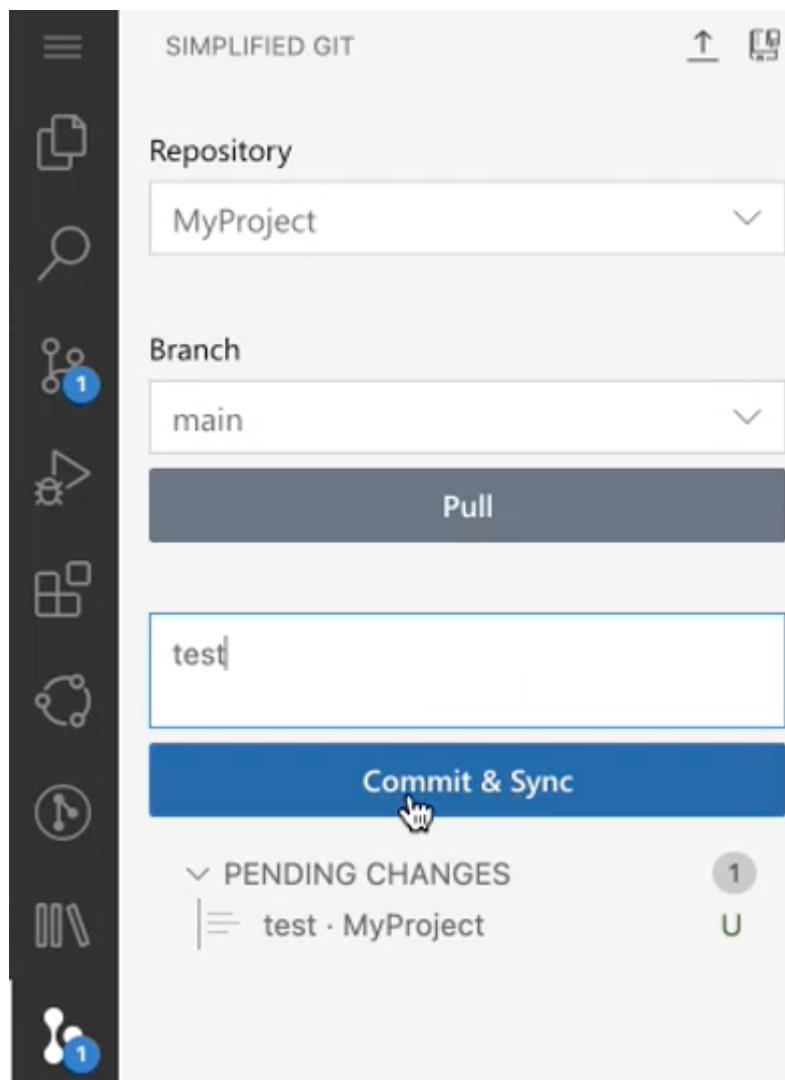
If you haven't created a project, click **Create Project** to create one from a template. See [Creating a Project Using the Wizard](#).

2. Click **Add Remote Repository**.
3. When prompted, add the URL for the remote repository where your local repository will be pushed.
4. Enter your Git username and password (or token).
5. Choose whether to save your Git credentials for future use.

Commit Changes in the Simplified Git View

In the **SIMPLIFIED GIT** view, you can add the current changes to the last commit.

To add your changes to the remote Git repository, enter a message describing your changes and click **Commit & Sync**.



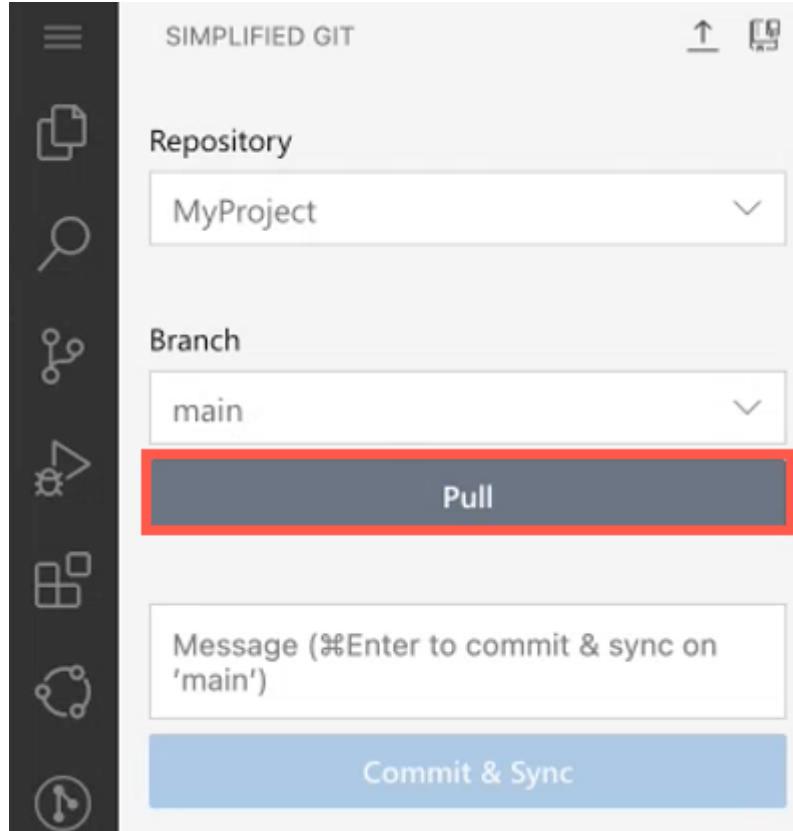
Pull Changes in the Simplified View

In the **SIMPLIFIED GIT** view, you can pull changes to download objects and references from the remote repository into your local repository, and then merge the changes into your project.

You can see a list of all changes in the **PENDING CHANGES** section.

For example, if you make a change to the project from the terminal, the change is automatically detected and appears in the **PENDING CHANGES** section.

Click **Pull** to pull the changes made in the remote repository to your project.



Resolve Conflicts in the Simplified Git View

Merge operations can fail because of conflicts between the current branch and the branch from which you choose to incorporate the changes. You can resolve merge conflicts using the **SIMPLIFIED GIT** view.

1. When there are conflicts, the **MERGE FILES** section is displayed.

Repository

mkfiorinwapp2



Branch

main



Pull

Message (⌘Enter to commit & sync on 'main')

Commit & Sync

✓ MERGE FILES

List.view.xml · mkfiorinwapp2

1

!

2. Click one of files to resolve the conflict.

A split view is displayed.

Merging: List.view.xml 5, !

Incoming	Current
<code>s:semantic="sap.f.semantic" xmlns:mvc="sap.ui.core.mvc" controllerName="mkfiorinwapp2.controller.List" d="listPage" preserveHeaderStateOnScroll="true" toggleHeaderOnTitleClick="false"></code>	<code>s:semantic="sap.f.semantic" xmlns:mvc="sap.ui.core.mvc" controllerName="mkfiorinwapp2.controller.List" d="listPage" preserveHeaderStateOnScroll="true" toggleHeaderOnTitleClick="false"></code>
<code>ng></code>	<code>ng></code>
<code>Accept Incoming Ignore</code>	<code>Accept Current Ignore</code>
<code>ageTitle" text="Other's change {listView>/title}" level="H2"/></code>	<code>ageTitle" text="My change - {listView>/title}" level="H2"/></code>
<code>ing></code>	<code>ing></code>
<code>side filtering add this to the items attribute: parameters: {operationMode: 'Client'}" width="auto" class="sapFDynamicPageAlignContent" items="{}></code>	<code>side filtering add this to the items attribute: parameters: {operationMode: 'Client'}" width="auto" class="sapFDynamicPageAlignContent" items="{}></code>
<code>active="true" id="filterBar" visible="{listView>/isFilterBarVisible}" le id="filterBarLabel" text="{listView>/filterBarLabel}" level="H3"></code>	<code>active="true" id="filterBar" visible="{listView>/isFilterBarVisible}" le id="filterBarLabel" text="{listView>/filterBarLabel}" level="H3"></code>

Result mkfiorinwapp2 · webapp/view/List.view.xml

```

1 s:semantic="sap.f.semantic" xmlns:mvc="sap.ui.core.mvc" controllerName="mkfiorinwapp2.controller.List">
2
3 d="listPage" preserveHeaderStateOnScroll="true" toggleHeaderOnTitleClick="false">
4 ng>
5 Accept Current | Ignore
6 ageTitle" text="My change - {listView>/title}" level="H2"/>
7 ing>
8 side filtering add this to the items attribute: parameters: {operationMode: 'Client'}" width="auto" class="sapFDynamicPageAlignContent" items="{}>
9 active="true" id="filterBar" visible="{listView>/isFilterBarVisible}" le id="filterBarLabel" text="{listView>/filterBarLabel}" level="H3">
10
11
12
13

```

1 Conflict Remaining

No Changes Accepted

Complete Merge

3. Choose one of the following options to resolve the merge conflict:

- o **Accept Current Change:** Apply the selected line of change from the current branch.

- **Accept Incoming Change:** Apply the selected line of change from the remote branch.
 - **Ignore:** Ignore the selected line of change.
 - **Complete Merge:** Open the **SOURCE CONTROL** view to complete the merge. Only choose this option if you want to use the **SOURCE CONTROL** view.
4. Enter a message describing your changes and click **Commit & Sync** to complete the conflict resolution and sync your changes to the remote repository.

Clone a Repository in the Simplified Git View

Clone a repository using the **SIMPLIFIED GIT** view.

1. Click  (Clone Repository).

2. Enter the URL of the remote repository that you want to clone.
3. Select the folder where you want to clone the repository.
4. Click **Open** to open the cloned repository in SAP Business Application Studio.

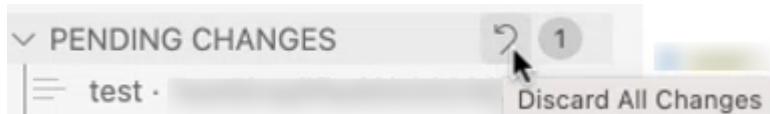
You can also choose to open the repository in a new window or add it to a workspace.

Perform Actions in the Pending Changes Section

You can discard all changes, individually ignore each pending change, or you can open an updated file in the **PENDING CHANGES** section.

Discard All Changes

1. In the **PENDING CHANGES** section, click the arrow to discard all changes.



2. Confirm that you want to merge all files without any of your changes.

Ignore Pending Changes Individually

Click  (Add to `.gitignore`) to ignore pending changes individually.

Open Updated File

Click  (Open File) to open an updated file.

Create a Branch in the Simplified Git View

Create a new branch using the **SIMPLIFIED GIT** view and publish it to the remote repository.

1. In the **Branch** section, open the dropdown list and select **+ Add New Branch**.

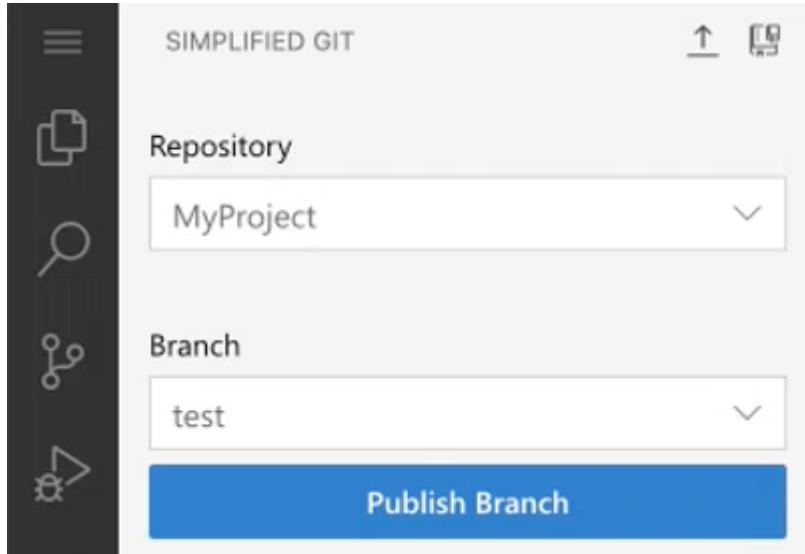
2. Enter a name for the new branch.

3. Select one the following options:

- **main**: Create a branch of the main directory on the local repository
- **origin/main**: Create a branch of the main directory on the remote repository

The new branch is added to the dropdown list in the **Branch** section.

4. Select **Publish Branch** to sync the new branch with the remote repository.



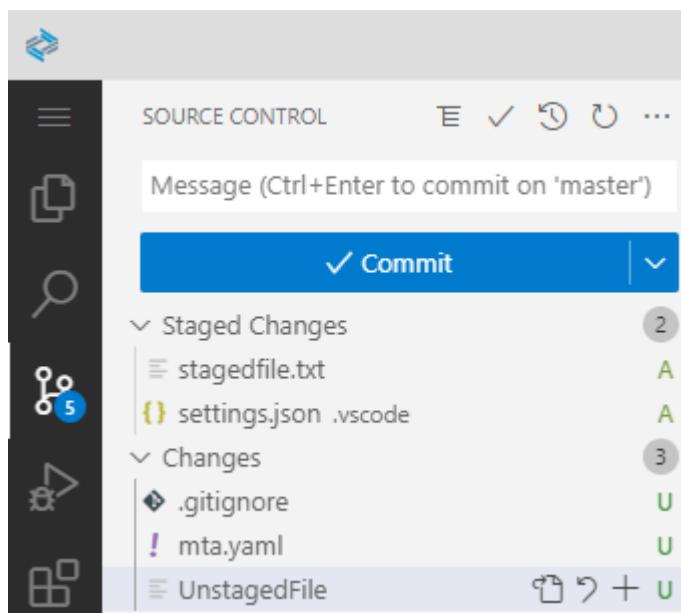
Using the Advanced Git View

General overview of the advanced Git view, the **SOURCE CONTROL** view, in SAP Business Application Studio.

SAP Business Application Studio provides a graphical user interface for executing Git commands and managing your source control and versioning. You can also manually perform other Git commands from the terminal. This view contains all the options for Git source control.

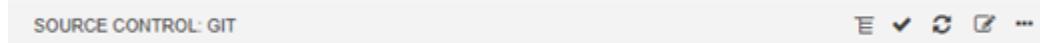
Source Control View

To open the **SOURCE CONTROL** view, click  from the activity bar.



The **SOURCE CONTROL** view is divided into the following sections:

SOURCE CONTROL view menu



- Click to toggle between list and tree views.
- Click (or press **<Ctrl>** + **<Enter>**) to commit the changes.
- Click to refresh the Git pane.
- Click to view the Git history.
- Click to see more available actions. See [Git Commands](#)

Message section

Enter a description for the commit.

Staged Changes section

Shows the files that will be included in the next commit.



Hover over the section title to see additional actions.

- Click to unstage all files in the section.

Hover over the files in this section to see additional actions:

- Click to unstage the changes in the file.
- Click to open the file.

Changes section

Shows the files that contain changes.



Hover over the section title to see additional actions.

- Click to discard all changes.
- Click to stage all changes.

Hover over the files in this section to see additional actions:

- Click to discard the changes in the file.
- Click to open the file.
- Click to stage the changes in the file.

Amend section.

Click **Amend** at the bottom of the pane to make changes to a commit.

Git Status Bar

At the bottom-left corner of SAP Business Application Studio, you can find indicators describing the status of your Git repository. They show the current branch, dirty indicators, and the number of ahead and behind changes of the current branch.



The dirty indicators are as follows:

*****: You have unstaged changes in your branch.

+: You have staged changes in your branch, but no unstaged changes.

!: You have conflicting changes in your branch.

Clicking on the branch name, opens the command palette showing additional Git commands.

There is also a **Synchronize Changes** action in the status bar, next to the branch indicator, if the currently checked-out branch has an upstream branch configured. Clicking **Synchronize Changes** opens the command palette showing additional Git commands that can be applied to the branch.

Branches

You can create and check out branches directly within the IDE by using the **Git: Checkout** command in the command palette.

To create a new branch:

1. Click on the active branch name in the status bar. The command palette opens.
2. Enter a name for the new branch. A new branch is created and checked out.

Gutter Indicators

If you open a folder that is a Git repository and begin making changes, annotations are added to the gutter and to the overview ruler.

- A red triangle indicates where lines have been deleted.
- A green bar indicates new added lines.
- A blue bar indicates modified lines.

Connecting an Existing Project to Git

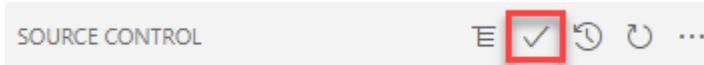
You can add an existing project to Git.

1. In the Project Explorer, select your project.
2. Click  from the activity bar to open the Git view.
3. Click  to initialize the local repository.

4. Click in the **Changes** section to add the files in your new local repository. This stages them for the first commit.



5. Click (or press **<Ctrl>** + **<Enter>**) to commit the files that you've staged in your local repository.



6. When prompted, provide a commit message. Your project is now connected to your local Git repository.

Adding a Project to Git Remote

1. Click from the activity bar to open the Git view.

2. Click to see more available actions.

3. Select **Remote > Add Remote**.

4. When prompted, add the URL for the remote repository where your local repository will be pushed.

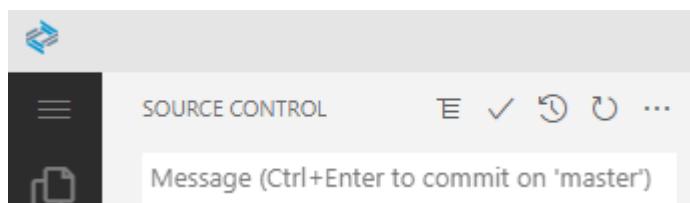
5. Push the changes in your local repository to the remote Git repository. See [Push Changes](#).

Understanding the UI

SAP Business Application Studio provides a graphical user interface for executing Git commands and managing your source control and versioning.

Understanding the UI

The Git view consists of three major sections. The top section is for authoring the commit messages. It also provides access to a couple of basic Git commands.



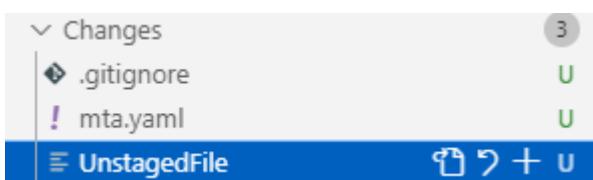
Below this, you find the commit section, which lists the changed files by their name and separates them in two groups:

- **Staged Changes** - A list of the files that have been staged. Click to open the selected file, or to unstage it.



- **Changes** - Files listed under the **Changes** section contain unstaged changes. Each file name is followed by a path to its parent directory and an indicator describing the status of the change.

Click to open the selected file, to stage the file, or to refresh it.



The files can be in any of the following statuses:

- **A** - A new file that has been staged.
- **U** - An unstaged file. An unstaged change can be reverted by clicking on the **Discard Changes** action next to the file location.
- **M** - A modified file. Double-clicking on a modified file will open it in a diff editor. The read-only editor on the left-hand side shows the state from the index. The right-hand side of the editor reflects the state of the working tree, and it lets you to further modify the file.
- **C** - A copied file (if blue) or a conflicted file (if red).
- **D** - A deleted file.

At the bottom of the Git view you can see the last commit section, where a description of the most recent commit is displayed.

After staging the desired files and specifying the commit message, the changes can be committed to the repository. After a successful commit, the Last Commit section is automatically updated.

Git Commands

SAP Business Application Studio supports Git commands from the Git view and from the command palette.

[Commit \(Amend\) Changes](#)

Enables you to add the current changes to the last commit.

[Commit \(Signed Off\) Changes](#)

Enables you to save your changes to the local repository. Sign-off is a line at the end of the commit message that certifies who is the author of the commit.

[Fetch Changes](#)

Fetching enables you to download objects and references from a remote repository into your local repository. You can then merge or rebase the changes into your project.

[Merge Changes](#)

You can incorporate all the changes from one branch into another in a single commit.

[Pull Changes](#)

Pulling is the same as fetching and merging. Pulling enables you to download objects and references from the remote repository into your local repository, and then merge the changes into your project.

[Push Changes](#)

The Push option incorporates all unsynced committed changes into the remote branch of the currently checked-out local branch.

[Discard Changes](#)

Discarding removes all changes from the active branch. For example, discarding a new file removes it from the branch.

[Stage and Unstage Changes](#)

You can add or remove all the changes in the **Changes** section with one click.

[Git Stash](#)

Use **Stash** to record the current state to the working directory and then go back to a clean working directory. Your local changes are saved and the directory reverts to match the HEAD commit.

[View Diffs](#)

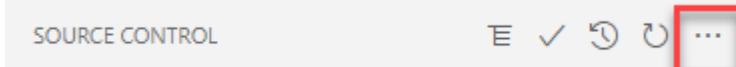
Compare different versions of a file.

Commit (Amend) Changes

Enables you to add the current changes to the last commit.

You can combine staged changes with the previous commit instead of creating an entirely new commit. It can also be used to simply edit the previous commit message without changing it.

1. From the **SOURCE CONTROL** view menu, click More Actions.

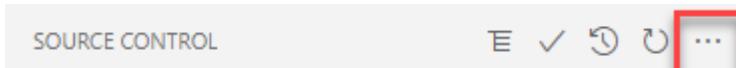


2. Select **Commit (Amend)**.

Commit (Signed Off) Changes

Enables you to save your changes to the local repository. Sign-off is a line at the end of the commit message that certifies who is the author of the commit.

1. From the **SOURCE CONTROL** view menu, click More Actions.

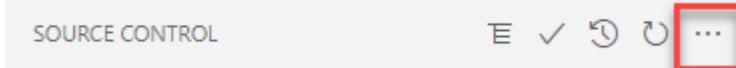


2. Select **Commit (Signed Off)**. The commit message is sent including the signature of the committer.

Fetch Changes

Fetching enables you to download objects and references from a remote repository into your local repository. You can then merge or rebase the changes into your project.

1. From the **SOURCE CONTROL** view menu, click More Actions.



2. Select **Fetch....** The command palette is displayed.

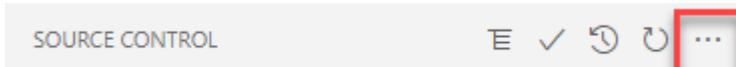
3. From the list, select the remote Git repository from which you want to fetch the changes.

Merge Changes

You can incorporate all the changes from one branch into another in a single commit.

To merge a branch into another:

1. From the **SOURCE CONTROL** view menu, click More Actions.



2. Select **Merge....** The command palette opens.

3. Select the branch you want to merge into the currently active branch.

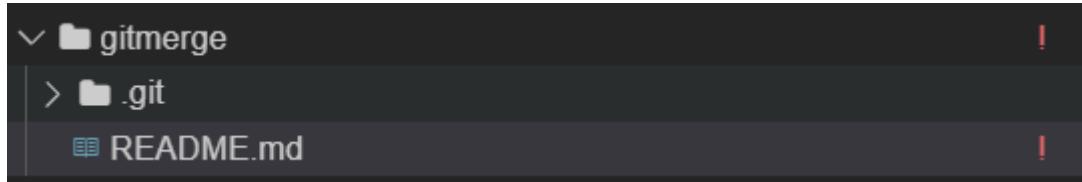
Dealing with Merge Conflicts

Merge operations can fail because of conflicts between the current branch and the branch you choose from which to incorporate the changes. To see which files have merge conflicts, navigate to the console or the explorer:

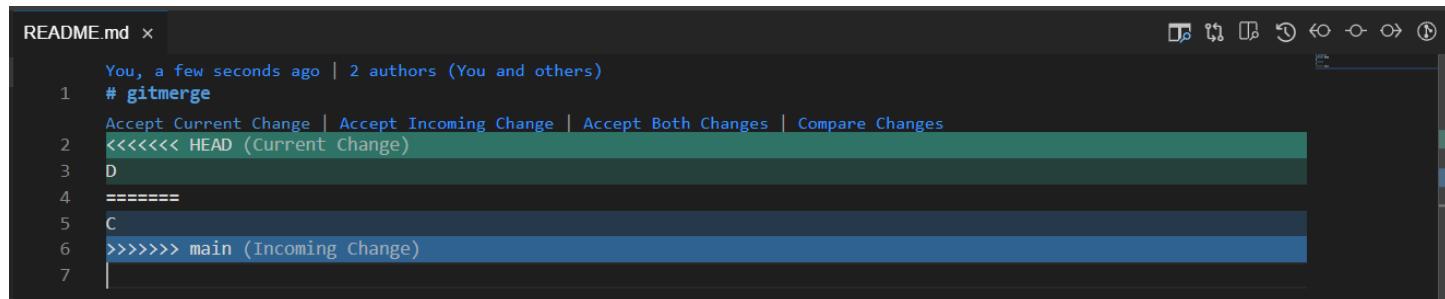
- The console displays a list of all files with merge conflicts.

```
user: gitmerge $ git merge main
Auto-merging README.md
CONFLICT (content): Merge conflict in README.md
Automatic merge failed; fix conflicts and then commit the result.
```

- The explorer displays "!" next to any files with conflicts.



When you access a file with conflicts, the conflicts and the options for resolving them are displayed in the file.



Choose from the following options to resolve the merge conflict:

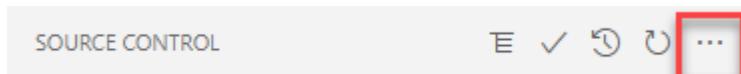
- Accept Current Change:** Apply only the changes from the current branch.
- Accept Incoming Change:** Apply only the changes from the target branch.
- Accept Both Changes:** Merge both changes (the first change from the current branch and the second change from the target branch).
- Compare changes:** View the differences (current and target) in a split window.

Pull Changes

Pulling is the same as fetching and merging. Pulling enables you to download objects and references from the remote repository into your local repository, and then merge the changes into your project.

Pull

- From the **SOURCE CONTROL** view menu, click More Actions.



- Select **Pull**.

The changes are fetched from the specific branch and merged into your local checked-out branch.

Pull From

This feature has the same functionality as Pull, but in this case, when you select the action, the command palette is displayed and you can define the repository from which you want to pull the changes.

1. From the **SOURCE CONTROL: GIT** menu, click More Actions.
2. Select **Pull from**. The command palette is displayed.
3. Select the the repository from which you want to pull the changes.

Push Changes

The Push option incorporates all unsynced committed changes into the remote branch of the currently checked-out local branch.

The number of unsynced committed changes is displayed next to the repository name. All tags created within the open repository are pushed.

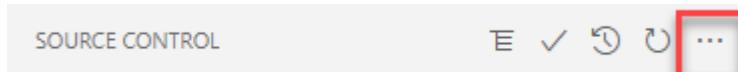
i Note

It is recommended to [pull changes](#) before pushing changes. This action ensures that your local copy is synced with the remote repository.

If a team member pushed to the remote repository and you push changes before syncing, you may encounter some issues, including head annotations or merge conflicts.

Push

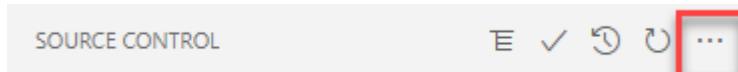
1. From the **SOURCE CONTROL** view menu, click More Actions.



2. Select **Push**.

Push to

1. From the **SOURCE CONTROL** menu, click More Actions.



2. Select **Push to**. The command palette is displayed.
3. Select the target remote repository branch to which you want to push.

Discard Changes

Discarding removes all changes from the active branch. For example, discarding a new file removes it from the branch.

Move your mouse over the file containing the changes you want to discard and click **Discard Changes**.

i Note

This is custom documentation. For more information, please visit the [SAP Help Portal](#)

Only unstaged files can be discarded.

Stage and Unstage Changes

You can add or remove all the changes in the **Changes** section with one click.

- Click **Stage All Changes** to adds all changed files to the list of changes that will be included in the next commit.
- Click **Unstage All Changes** to remove all changed files from the next commit.

Git Stash

Use **Stash** to record the current state to the working directory and then go back to a clean working directory. Your local changes are saved and the directory reverts to match the HEAD commit.

Pop Stash

Removes a single entry from the stash list and applies it on top of the current working tree state. This is the inverse operation of stash push.

If there are conflicts, the entry is not removed from the stash list. You need to resolve the conflicts and perform stash drop manually afterwards.

Pop Latest Stash

Removes the latest entry from the stash list and applies it on top of the current working tree state.

Apply Stash

Takes a single entry from the stash list and applies it on top of the current working tree state. This functionality is like Pop Stash, but without removing the entry from the stash list.

Apply Latest Stash

Takes the latest entry from the stash list and applies it on top of the current working tree state.

Drop Stash

Removes a single stash entry from the list of stash entries.

View Diffs

Compare different versions of a file.

View Changes in Local Repository

Clicking a modified file opens a diff viewer. Its left-hand side is a read-only editor showing the index state, and the right-hand side is an editor for the working-tree state.

```

1 # generator-module-sample
2
3 ## Description
4
5 This repo contains a sample mta module generator.
6
7
8
9 ## Running Locally
10 In the terminal type:
11 ``sh
12 # install yeoman
13 npm install -g yo
14 # install dependencies of this generator
15 npm install
16 # make this generator available locally
17 npm link
18 # run this generator
19 yo module-sample
20 ``
21
22 ## Running in App Studio
23 Open the terminal:
24 ``sh
25 # bring you project from git
26 git clone https://github.wdf.sap.corp/devx-wing/generator-module-sample

```

1 # generator-module-sample
2
3 ## Description
4
5 This repo contains a sample mta module generator.
6
7
8
9 ## Running Locally
10 In the terminal type:
11 ``sh
12 # install yeoman
13 npm install -g yo
14 # install dependencies of this generator
15 npm install
16 # make this generator available locally
17 npm link
18 # run this generator
19 yo module-sample
20 ``
21
22 ## Running in App Studio
23 Open the terminal:
24 ``sh
25 # bring you project from git
26 git clone https://github.wdf.sap.corp/devx-wing/generator-module-sample

View Changes in Different Branches

1. Select a modified file from the task explorer.
2. From the command palette, enter **Git Diff: Compare With**.
3. Select the branch to which you want to compare the currently active branch.

A diff viewer is displayed. Its left-hand side is a read-only editor showing the current branch, and the right-hand side shows the file in the selected branch.

Setting Up Git to Work with Gerrit

Gerrit is a web-based software code review tool for reviewing, approving, or rejecting changes to the source code developed by your colleagues. Gerrit works as an intermediate environment for source control between the local environment and the remote Git repository.

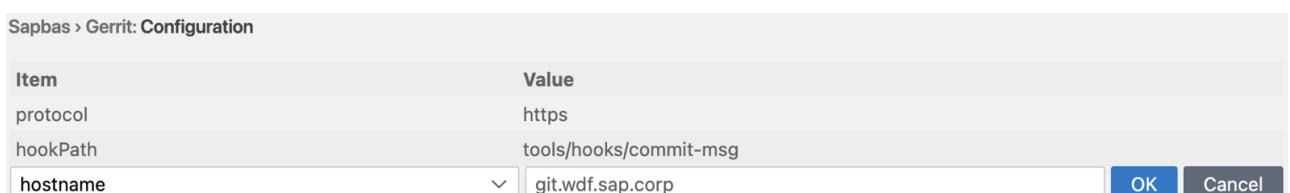
Prerequisite

You configured the required Cloud Connector and destination in your account.

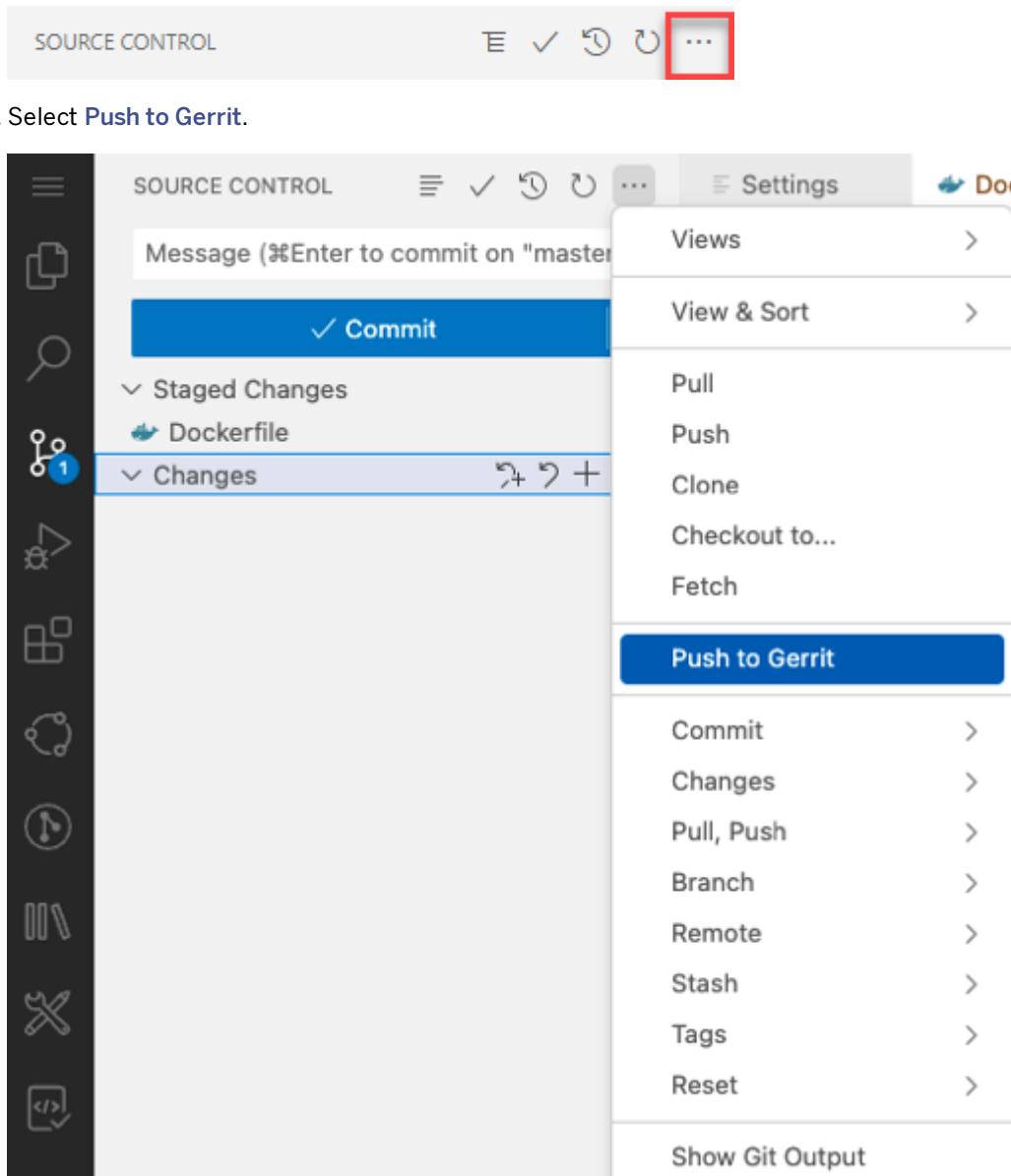
Procedure

1. Enable Gerrit:
 - a. Navigate to **File > Preferences > Settings**.
 - b. From the list of preferences, under **Extensions**, click **Sapbas**.
 - c. Under **Gerrit: Enabled**, select the **Whether gerrit is enabled** checkbox.
 - d. Under **Gerrit: Configuration**, click **Add Item** and add the required properties (**hookPath**, **protocol**, and **hostname**) and their values, which can be obtained from your organization's Gerrit administrator.

This is the configuration for SAP WDF Gerrit system:



2. Clone your project. See [Cloning Repositories](#).
3. Perform your change and create a commit. See [Commit \(Amend\) Changes](#).
4. From the **SOURCE CONTROL** view menu, click More Actions.



Related Information

[Cloud Connector](#)
[Install the cloud connector](#)
[Configure Systems in Cloud Connector](#)

Terminal

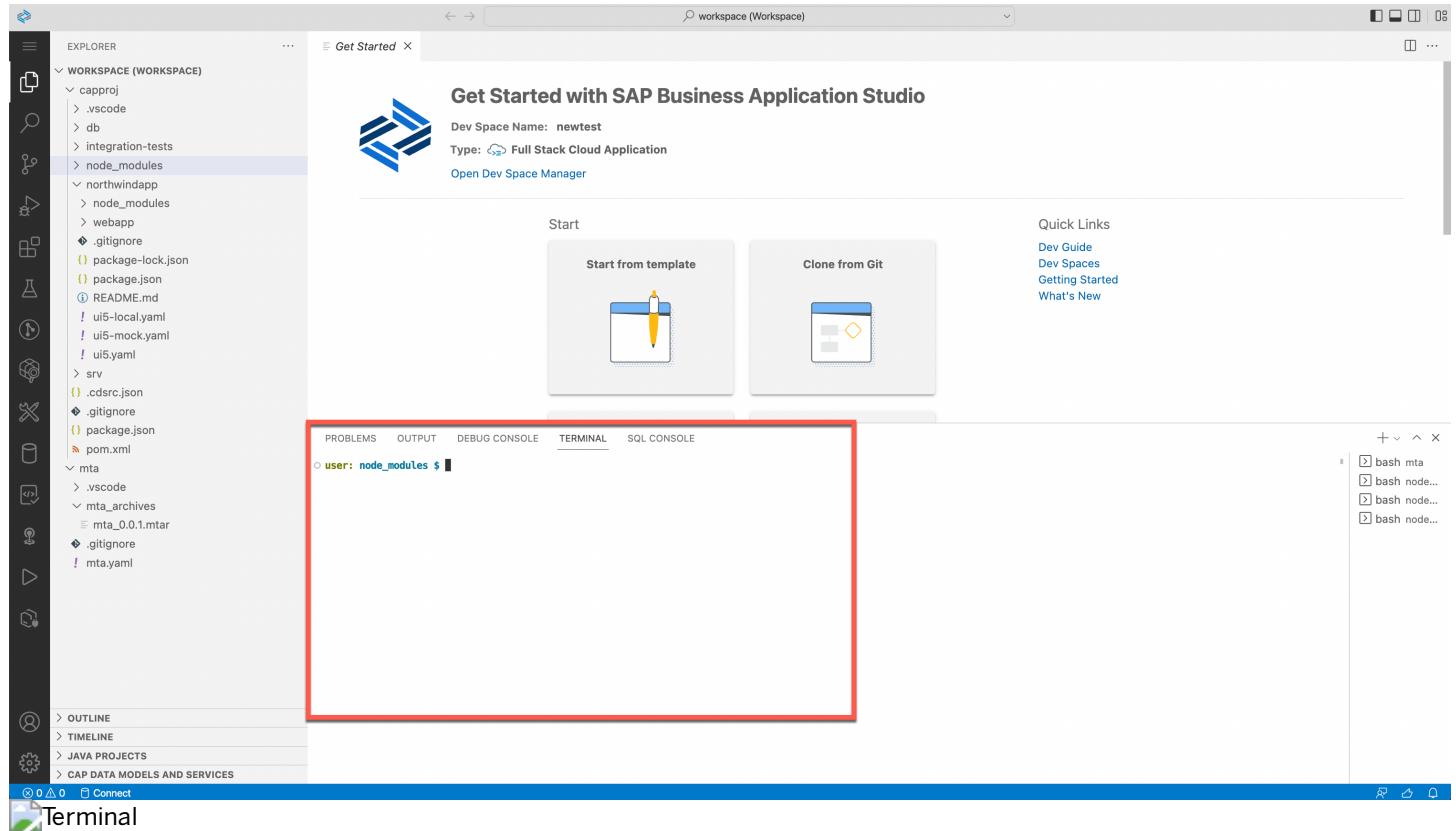
Opening the integrated terminal allows you to access the underlying system. The terminal is a convenient tool because you don't need to switch windows or change the state of an existing terminal to perform a quick command-line task.

You can create multiple terminals open to different locations and easily navigate between them.

With access to the terminal, you can use any tool that is pre-installed on your dev space, such as maven and npm. You can install additional tools, including global npm packages and other CLIs, using npm install. You can execute commands from the command line, create new projects or modules, build applications, and deploy applications from the terminal.

From the left-side menu, select **Terminal** to open the terminal.

To open the terminal at a specific directory, right-click the desired file in the **File Explorer**, and select **Open in Integrated Terminal**.



Related Information

[Create an SAPUI5 App from the Command Line](#)

Layout Editor

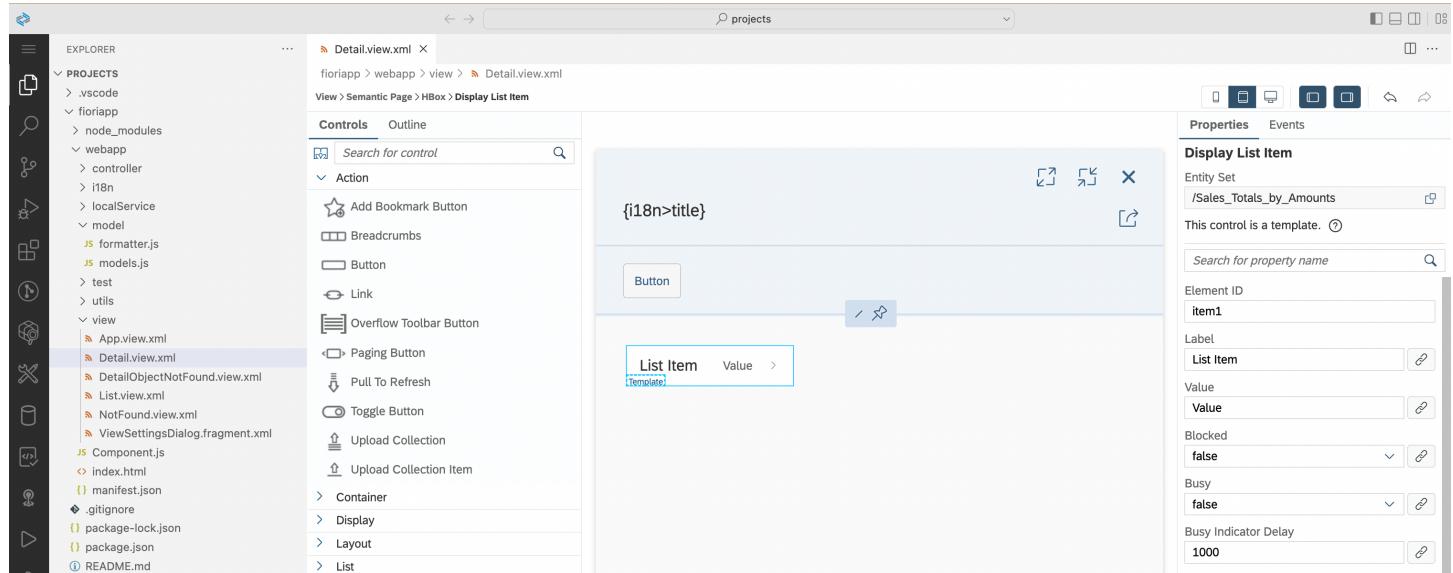
Display the content of an XML view in the layout editor to see it in a way that closely corresponds to how it will appear in your finished application.

i Note

The layout editor is not supported in the Safari browser.

Layout Editor Landscape

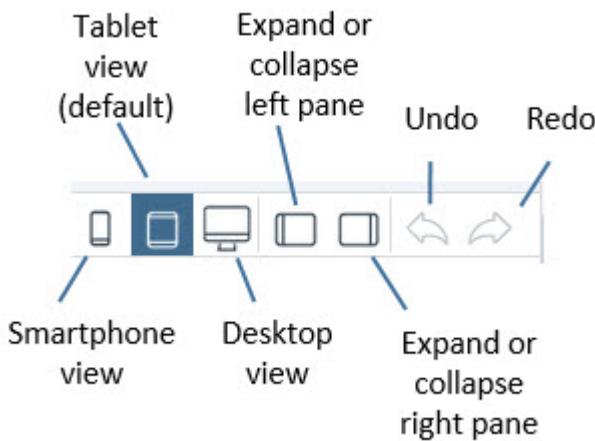
The layout editor is composed of a canvas, a pane on the left that includes the **Controls** and **Outline** tabs, and a pane on the right that includes the **Properties** pane.



Toolbar

The buttons on the layout editor toolbar allow you to:

- Change the device format of the canvas to smartphone, tablet, or desktop view.
- Expand and collapse the panes to the right and left of the canvas.
 - The pane on the left side includes the **Controls** and **Outline** tabs.
 - The pane on the right side includes the **Properties** pane.
- Undo and redo actions.



Controls Tab

You can expand or collapse each section by clicking the arrow on each section header. You can also search for controls by entering the control name in the search field at the top of the **Controls** tab. The relevant sections expand to display the controls that match the search criteria.

i Note

Make sure to delete the search criteria if you want to expand other sections.

You can drag and drop controls from the **Controls** tab onto the canvas. For more information, see [Add Controls from the Controls Tab](#).

View > Shell > App > Page > Link

Controls Outline



Search for control



- > Action
- > Container
- > Display
- > Layout
- > List
- > Semantic (sap.f)



Semantic Page

- > Semantic (sap.m)
- > Smart
- > Tile
- > User Input
- > Visual Business

You can find the list of available controls in [SAPUI5 Controls Supported in the Layout Editor](#).

Outline Tab

Controls that are selected on the **Outline** tab are automatically selected on the canvas and vice versa.

You can use the **Outline** tab to see the hierarchy of controls on the canvas. In addition, you can add and remove controls from the canvas using the **Outline** tab.

For more information, see [Add Controls from the Outline Tab](#).

View > Shell > App > Page > List > Standard List Item

Controls **Outline**

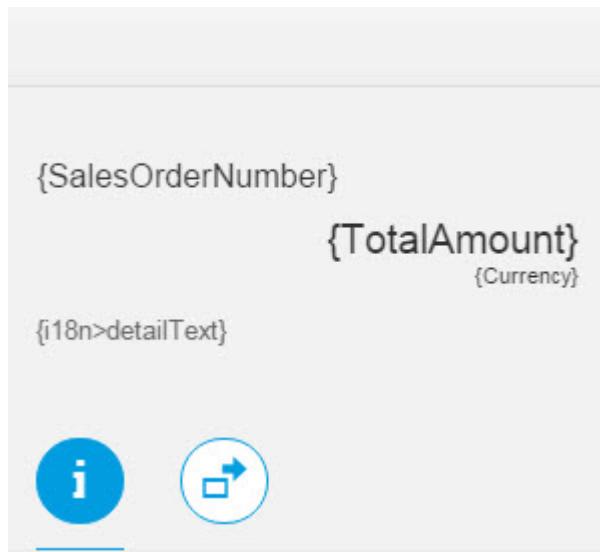
Search

- ✓ View1.view.xml
 - ✓ sap.m.Shell
 - ✓ app
 - ✓ sap.m.App
 - ✓ pages
 - ✓ sap.m.Page
 - ✓ content
 - ✓ sap.m.List
 - ✓ items
 - sap.m.StandardListItem
 - swipeContent
 - headerToolbar
 - infoToolbar
 - contextMenu
 - ✓ sap.m.List
 - ✓ items
 - sap.m.StandardListItem
 - swipeContent
 - headerToolbar
 - infoToolbar
 - contextMenu
 - customHeader
 - footer
 - subHeader
 - headerContent
 - landmarkInfo

Canvas

The canvas in the middle of the layout editor area provides a graphical display of the selected XML view.

Click a control on the canvas to select it. To select a parent control, hold **Ctrl** and click. You can keep clicking until you reach the highest control in the hierarchy and then the focus will return to the original control. Click outside the canvas to undo the selection.



NetPriceAmount:

{NetPriceAmount}

TaxAmount:

{TaxAmount}

{OrderDate}



Properties Pane

On the right side of the canvas is a pane that displays the following pane:

Properties Pane

The **Properties** pane shows the properties of the control that is currently selected in the canvas and allows you to modify its property values. The most commonly used properties for each control are displayed at the top of the list. The  icon next to each property opens the **Data Binding** dialog box.

For more information, see [Binding Data](#), [Bind Data to a Simple Control](#), and [Bind Data to an Aggregate-Type Control](#).

Properties **Events**

Standard List Item

i Entity Set
Not defined

Search for property name 

Element ID
item0_1606740363277

Title
List Item 1 

Description
Description text 

Icon
sap-icon://picture  

Active Icon
 

Adapt Title Size
true  

Blocked
false  

Busy
false  

Busy Indicator Delay
1000 

Busy Indicator Size
Medium  

Counter
0 

Field Group Ids

i Note

Deprecated properties or aggregations are marked with the label **deprecated** (also in the **Outline** tab). For more information, see [SAP Library for User Interface Add-On 1.0 for SAP NetWeaver](#) on SAP Help Portal at <http://help.sap.com/nw-uiaddon>. Under *Application Help*, open *SAP Library*, and search for *deprecation*.

Related Information

[Working with the Layout Editor](#)

Working with the Layout Editor

An overview of the steps required to edit a project using the layout editor.

Prerequisites

You have created a project using the [SAP Fiori List-Detail Application](#) template.

To create a project using this template, perform the following steps:

1. From the template wizard, select the [SAP Fiori application](#) generator.
2. Select the [SAPUI5 freestyle](#) application type.
3. Select the [SAP Fiori List-Detail Application](#).
4. Follow the wizard steps and provide the required information.

In the view folder of this project, you can edit the following views:

- `Detail.view.xml`
- `List.view.xml`

Procedure

1. From the context menu of the XML view, choose [Open With...](#) and select the [Layout Editor](#) from the command center.
2. Edit the views of your application as follows:
 - Add controls to your view using the drag and drop functionality.
 - Delete controls from your view.
 - Rearrange controls in your view using the drag and drop functionality.
 - Use the keyboard to navigate within the canvas. Double-click on a control to move the selection to its parent.
 - Bind controls in the layout editor to elements from the OData service.

Add Controls from the Outline Tab

You can add controls to the canvas from the [Outline](#) tab.

Procedure

1. On the [Outline](#) tab, select a control to which you want to add another control.
2. At the top of the [Outline](#) tab, click the [Add](#)  button, then in the popup menu, select the control you want to add.

The control is added on the [Outline](#) tab and appears on the canvas.

Note

The information bar at the top of the canvas shows you where you are about to drop the control.

Related Information

- [Delete Controls from the Outline Tab](#)
- [SAPUI5 Controls Supported in the Layout Editor](#)

Delete Controls from the Outline Tab

You can remove controls from the **Outline** tab.

Procedure

1. On the **Outline** tab, select a control that you want to delete.
2. At the top of the **Outline** tab, click the **Delete**  button.

The control is removed from the view.

Related Information

- [Add Controls from the Outline Tab](#)
- [SAPUI5 Controls Supported in the Layout Editor](#)

Add Controls from the Controls Tab

Add controls to the canvas by using drag and drop functionality.

Select the control that you want to add to the canvas from the **Controls** tab on the left side of the layout editor area and drag it to the drop target on the canvas. A tooltip displays the drop targets as you drag the control around the canvas.

Example

If you want to add an **HBox** layout with a **Button** control to your view, do the following:

1. Choose the **Controls** tab.
2. Open the **Layout** section by clicking the arrow to the left of the section title.
3. Select the **HBox** control and drag it to the canvas. Drop it at the position where you want it to appear.
4. Open the **Action** section by clicking the arrow to the left of the section title.
5. Select the **Button** control and drag it to the canvas.
6. Drop the **Button** control onto the **HBox** layout.

Keyboard Support

Use the keyboard to move selected controls or navigate within the view that you opened with the layout editor.

Selecting Controls

If you selected a control in the canvas of the layout editor, you can move the selection using the arrow keys:

- **UP ARROW**: moves the selection to the parent of the selected control

- **DOWN ARROW**: moves the selection to the child of the selected control
- **LEFT ARROW**: moves the selection to the control that is up/to the right of the selected control (within the same aggregation)
- **RIGHT ARROW**: moves the selection to the control that is down/to the left of the selected control (within the same aggregation)
- **CTRL** + click: moves the selection to the parent of the selected control

Moving Selected Controls

If you have selected a control in the canvas of the layout editor, you can change its position within the aggregation:

- **SHIFT** + **LEFT ARROW**: moves the control up/to the right
- **SHIFT** + **RIGHT ARROW**: moves the control down/to the left

Changing the Drop Target

When you drag and drop a control from the palette to the canvas or from one position within the canvas to another, you can use the keyboard to define the drop position of the dragged control:

- Use **SHIFT** or **ALT** to define the drop position of the dragged control within an aggregation:
 - **SHIFT**: moves the drop position up/to the right
 - **ALT**: moves the drop position down/to the left

Binding Data

In the layout editor, you can bind properties of controls or control aggregations to an artifact in the OData service.

Prerequisites

You have defined a data set for the view that you are working on, by doing one of the following:

- If you are opening a view that has no data set defined for it, the **Data Binding** dialog box opens, where you can define a data set.
- Select the view, and define the data set from the dropdown list.

⚠ Caution

If you change the data set that is defined for the current view, the existing data bindings might become invalid.

Overview

The following types of bindings are possible:

- Properties of controls
- Aggregations of controls

i Note

To bind properties of models that are not OData models, you must work from the source code files and not from the layout editor. Alternatively, if you do not want to work with the source files in the XML editor, you can enter free text for properties in the **Properties** pane.

i Note

If your application does not consume an OData service, you can add the **OData Service** component to it.

Related Information

[SAPUI5 API Reference](#)

Define Entity Set

Before you can bind data to a control, you need to define an entity set.

Prerequisites

- You have created a project in the layout editor. For more information, see [Working with the Layout Editor](#).
- You have dragged a control from the **Controls** pane to the canvas. For more information, see [Add Controls from the Controls Tab](#).

Procedure

1. In the canvas, select the control for which you want to define an entity set.
2. In the **Properties** pane, click the icon.
The **Select Entity Set** dialog box opens.
3. Select and configure one of the entity sets for your control.

i Note

Most users should use either of the first two entity sets listed below.

- **Use ancestor's entity set.**
- **Define dummy entity set for the selected control.**

! Restriction

The "dummy" entity set is only for advanced users.

- **Define entity set and set the selected control as template.**

4. Click **Bind**.

Bind Data to a Simple Control

You can bind data to a simple control.

Procedure

1. On the canvas, select the desired control for which you want to define data binding.
2. In the **Properties** pane to the right of the canvas, do one of the following:

- o To the right of the property to which you want to bind data, click the Binding  button, and then in the Data Binding dialog box:
 - a. In the **Data Fields** list, double-click one or more data fields that you want to add to the expression.
The data fields are automatically concatenated to the string in the **Expression** box.
 - b. Click **Bind** or first manually edit the expression string and then click **Bind**.
- o In the **Properties** pane, for a field or dropdown list, manually enter the required expression within curly brackets {...} according to the data set that you selected.

Bind Data to an Aggregate-Type Control

You can bind data to an aggregate-type control, which creates a template.

Prerequisites

- You have defined an entity set. For more information, see [Define Entity Set](#).

Procedure

1. In the canvas or on the **Outline** tab to the left of the canvas, choose an aggregate-type control that you want to turn into a template, such as a **List Item** control.
2. In the **Properties** pane to the right of the canvas, from the **Select Entity Set** dialog box, select **Define entity set and set the selected control as template**, and click **Bind**.
This control becomes a template.
3. In the **Confirmation Needed** dialog box, confirm the removal of any existing controls on the same level by clicking **OK**.

Results

The template item is now marked **Template** in the **Outline** tab.

Bind to the i18n Model

You can bind a control property to the i18n model or create a new i18n entry.

Procedure

1. On the canvas, select the desired control for which you want to define i18n model binding.
2. In the **Properties** pane to the right of the canvas, do one of the following:
 - o To the right of the property to which you want to bind data, click the Binding  button, and then in the dialog box that appears:
 - a. From the drop down list, select **i18n**, double-click one or more entries that you want to add to the expression.
The entries are automatically concatenated to the string in the **Expression** box.
 - b. Click **Bind** or first manually edit the expression string and then click **Bind**.
 - o In the **Properties** pane, for a field or dropdown list, manually enter the required expression within curly brackets {...}.

- o Click + to add a new i18n entry.

Bind to a Label Annotation

You can bind a control property to a label annotation.

Context

You can bind a control property to a label annotation that resides in the OData metadata file. Other annotation files are not supported.

Procedure

1. On the canvas, select the desired control for which you want to define a label annotation binding.
2. In the **Properties** pane to the right of the canvas, do one of the following:
 - o To the right of the property to which you want to bind data, click the **Binding**  button, and then in the dialog box that appears:
 - a. From the drop down list, select **Labels**, double-click one or more annotation that you want to add to the expression.
 - The annotations are automatically concatenated to the string in the **Expression** box.
 - b. Click **Bind** or first manually edit the expression string and then click **Bind**.
 - o In the **Properties** pane, for a field or dropdown list, manually enter the required expression within curly brackets {...}.

SAPUI5 Controls Supported in the Layout Editor

Provides a list of SAPUI5 controls that are supported in the layout editor.

Controls Tab

The SAPUI5 controls listed below can be dragged and dropped from the **Controls** tab onto the canvas.

i Note

The controls on the **Controls** tab are also available from the **Outline** tab. For more information, see [Add Controls from the Outline Tab](#).

i Note

For more information about SAPUI5 controls, see [UI development toolkit for HTML5 - Demo Kit](#).

SAPUI5 Controls Available on the Controls Tab

| SAPUI5 Control Name | Description |
|----------------------|---|
| Action List Items | Button that is used to fire actions when pressed. |
| sap.m.ActionListItem | |

| SAPUI5 Control Name | Description |
|--|---|
| Action Select
sap.m.ActionSelect | Provides a list of predefined items that allows end users to choose options and additionally trigger some actions. |
| Add Bookmark Button
sap.ushell.ui.footerbar.AddBookmarkButton | Button that is displayed in the application footer. Clicking the button opens a dialog box that allows the user to save the app state, so that the app can be launched in this state directly from the launchpad. |
| Analytic Map
sap.ui.vbm.AnalyticMap | Renders a map based on a GeoJSON source. |
| App
sap.m.App | The root element of an SAPUI5 mobile application. It inherits from the NavContainer control and thus provides its navigation capabilities. App provides certain header tags to the HTML page that are relevant for mobile apps. |
| Bar
sap.m.Bar | Centers a control like a title while having other controls on its left and right. |
| Breadcrumbs
sap.m.Breadcrumbs | Enables users to navigate between items by providing a list of links to previous steps in the user's navigation path. The last three steps can be accessed as links directly, while the remaining links prior to them are available in a drop-down menu. |
| Busy Indicator
sap.ui.core.BusyIndicator | Provides methods to show or hide a waiting animation that covers the whole page and blocks user interaction. |
| Button
sap.m.Button | Allows users to trigger actions. |
| Calendar
sap.ui.unified.Calendar | Basic calendar that is used for DatePickers. |
| Calendar Legend
sap.ui.unified.CalendarLegend | Legend for the Calendar control. Displays special date colors with their corresponding description. |
| CalendarLegendItem
sap.ui.unified.CalendarLegendItem | Item to be displayed in a CalendarLegend. |
| Carousel
sap.m.Carousel | Navigates through a list of controls by swiping right or left. |
| Check Box
sap.m.CheckBox | Allows the user to select one or multiple items from a list. |
| Component Container
sap.ui.core.ComponentContainer | Container that embeds a UIComponent in a control tree. |
| Control Configuration
sap.ui.comp.smartfilterbar.ControlConfiguration | Can be used to add additional configuration for filter fields in the SmartFilterBar control, in order to overwrite the default settings from the OData metadata. For instance, it is possible to change the label, index or control type of a filter field. |
| Column
sap.m.Column | Allows definition of column-specific properties that are applied when rendering a List control. |
| Column List Item
sap.m.ColumnListItem | Used with cell aggregation to create rows for the sap.m.Table control. |

| SAPUI5 Control Name | Description |
|--|---|
| Combo Box
sap.m.ComboBox | Combines a dropdown list with items and a text input field with a button allowing the user to either type a value directly or choose from a list of predefined items. |
| Custom Data
sap.ui.core.CustomData | Contains a single key/value pair of custom data attached to an Element. |
| Custom List Item
sap.m.CustomListItem | With content aggregation, can be used to customize standard list items that are not provided by SAPUI5. <code>ListItem</code> type is applied to <code>CustomListItem</code> as well.

i Note
Content aggregation allows any control. Complex responsive layout controls (such as <code>Table</code> and <code>Form</code>) should not be aggregated as content. |
| Custom Tile
sap.m.CustomTile | Displays application-specific content in the <code>Tile</code> control. |
| Date Picker
sap.m.DatePicker | Date input control with a calendar used as a date picker. |
| Detail Page
sap.m.semantic.DetailPage | An <code>sap.m.semantic.ShareMenuPage</code> control that supports certain semantic buttons that have default semantic-specific properties and are eligible for content aggregation. |
| Display List Item
sap.m.DisplayListItem | Used to represent a label and a value. |
| DraftIndicator
sap.m.DraftIndicator | A draft indicator is <code>sap.m.Label</code> . |
| Feed Input
sap.m.FeedInput | Allows the user to enter text for a new feed entry and then post it. |
| Feed List Item
sap.m.FeedListItem | Provides a set of properties for text, sender information, and time stamp. |
| Filter Group Item
sap.ui.comp.filterbar.FilterGroupItem | Represents a filter belonging to a group other than basic. |
| Filter Item
sap.ui.comp.filterbar.FilterItem | Represents a filter belonging to the basic group. |
| Flex Item Data
sap.m.FlexItemData | Holds layout data for a <code>FlexBox</code> / <code>HBox</code> / <code>VBox</code> . |
| Flex Box
sap.m.FlexBox | Builds the container for a flexible box layout. |
| Form
sap.ui.layout.form.Form | Structured into <code>FormContainer</code> controls, each of which consists of <code>FormElement</code> controls. |
| Form Container
sap.ui.layout.form.FormContainer | Group inside a <code>Form</code> . |

| SAPUI5 Control Name | Description |
|--|---|
| Form Element
sap.ui.layout.form.FormElement | Row in a FormContainer control. |
| Fullscreen Page
sap.m.semantic.FullscreenPage | An sap.m.semantic.ShareMenuPage control that supports certain semantic buttons that have default semantic-specific properties and are eligible for content aggregation. |
| Generic Tile
sap.m.GenericTile | Displays header, subheader, and a customizable main area in a tile format. |
| Geo Map
sap.ui.vbm.GeoMap | A map control that allows the user to position multiple visual objects on top of a map. |
| Grid
sap.ui.layout.Grid | Layout that positions its child controls in a 12-column flow layout. |
| Grid Container Data
sap.ui.layout.form.GridContainerData | The GridLayout-specific layout data for FormContainers. |
| Grid Data
sap.ui.layout.GridData | Grid layout data. |
| Grid Element Data
sap.ui.layout.form.GridElementData | The GridLayout-specific layout data for FormElement fields. |
| Group
sap.ui.comp.smartform.Group | Groups are used to group group elements. |
| Group Configuration
sap.ui.comp.smartfilterbar.GroupConfiguration | Can be used to add additional configurations for groups in the SmartFilterBar. A group in the SmartFilterBar is a group of filter fields in the advanced search. |
| GroupElement
sap.ui.comp.smartform.GroupElement | A combination of one label and different controls associated to this label. |
| Group Header List Item
sap.m.GroupHeaderListItem | Used to display the title of a group and act as a separator between groups in sap.m.List and sap.m.Table. |
| HBox
sap.m.HBox | Builds the container for a horizontal flexible box layout. |
| Horizontal Layout
sap.ui.layout.HorizontalLayout | Provides support for horizontal alignment of controls. |
| Icon
sap.ui.core.Icon | Uses an embedded font instead of a pixel image. |
| Icon Tab Bar
sap.m.IconTabBar | Represents a collection of tabs with associated content. |
| Icon Tab Filter
sap.m.IconTabFilter | Represents a selectable item inside an Icon Tab Bar control. |

| SAPUI5 Control Name | Description |
|--|--|
| Icon Tab Header
sap.m.IconTabHeader | Displays a number of Icon Tab Filter and Icon Tab Separator controls. |
| Icon Tab Separator
sap.m.IconTabSeparator | Icon used to separate two Icon Tab Filter controls. |
| Image
sap.m.Image | Wrapper around the IMG tag. |
| Input
sap.m.Input | Allows users to input data. |
| Input List Item
sap.m.InputListItem | List item used for a label and an input field. |
| Invisible Text
sap.ui.core.InvisibleText | Used to bring hidden texts to the UI for screen reader support. |
| Item
sap.ui.core.Item | Control base type. |
| Label
sap.m.Label | Used in SAPUI5 mobile applications to provide label text for other controls. |
| Layout Data
sap.ui.core.LayoutData | A layout data base type. |
| Link
sap.m.Link | Used to trigger actions or to navigate to other applications or web pages. |
| List
sap.m.List | Provides a container for all types of list items. |
| List Item
sap.ui.core.ListItem | Used in lists or list-like controls, such as DropdownBox. |
| Master Page
sap.m.semantic.MasterPage | An sap.m.semantic.SemanticPage control that supports certain semantic buttons that have default semantic-specific properties and are eligible for content aggregation. |
| Message Strip
sap.m.MessageStrip | Allows the embedding of application-related messages in the application. |
| Nav Container
sap.m.NavContainer | Handles hierarchical navigation between Page controls or other fullscreen controls. |
| Object Attribute
sap.m.ObjectAttribute | Displays a text field that can be normal or active. |
| Object Header
sap.m.ObjectHeader | Allows the user to easily identify a special object. |

| SAPUI5 Control Name | Description |
|---|--|
| Object Identifier
sap.m.ObjectIdentifier | Display control that allows the user to easily identify a specific object. |
| Object List Item
sap.m.ObjectListIem | Display control that provides summary information about an object as an item in a list. |
| Object Number
sap.m.ObjectNumber | Displays number and number unit properties for an object. |
| Object Status
sap.m.ObjectStatus | Status information that can be either text with a value state, or an icon. |
| Overflow Toolbar
sap.m.OverflowToolbar | Container based on sap.m.Toolbar that provides overflow when its content does not fit in the visible area. |
| Overflow Toolbar Button
sap.m.OverflowToolbarButton | Represents an sap.m.Button that shows its text only when in the overflow area of an sap.m.OverflowToolbar. |
| Page
sap.m.Page | Basic container for a mobile application screen. |
| Paging Button
sap.m.PagingButton | Allows users to navigate between items and entities. |
| Pane Container
sap.ui.layout.PaneContainer | An abstraction of Splitter.

Could be used as an aggregation of ResponsiveSplitter or other PaneContainers. |
| Panel
sap.m.Panel | Container for controls that has a header and content. |
| Progress Indicator
sap.m.ProgressIndicator | Shows the progress of a process in a graphical way. |
| Pull To Refresh
sap.m.PullToRefresh | Triggers the refresh event. |
| Radio Button
sap.m.RadioButton | Control similar to CheckBox, but it allows the user to choose only one of a predefined set of options. |
| Radio Button Group
sap.m.RadioButtonGroup | Used as a wrapper for a group of sap.m.RadioButton controls, which then can be used as a single UI element. |
| Rating Indicator
sap.m.RatingIndicator | Used to rate content. |
| Responsive Flow Layout Data
sap.ui.layout.ResponsiveFlowLayoutData | This is a LayoutData element that can be added to a control if this control is used within a ResponsiveFlowLayout. |
| Search Field
sap.m.SearchField | Allows users to input a search string. |

| SAPUI5 Control Name | Description |
|--|--|
| Segmented Button
sap.m.SegmentedButton | Horizontal control made of multiple buttons, which can display a title or an image. |
| Segmented Button Item
sap.m.SegmentedButtonItem | Used for creating buttons for the sap.m.SegmentedButton. It is derived from the sap.ui.core.Item. |
| Select
sap.m.Select | Provides a list of items that allows the user to select an item. |
| Select List
sap.m.SelectList | Displays a list of items that allows the user to select an item. |
| Semantic Page
sap.f.semantic.SemanticPage | An enhanced sap.f.DynamicPage, that contains controls with semantic-specific meaning. |
| Semantic Page
sap.m.semantic.SemanticPage | An enhanced sap.m.Page control that can contain controls with semantic meaning. Content specified in sap.m.semantic.SemanticPage semantic control aggregations are automatically positioned in dedicated sections of the footer or the header of the page, depending on the control's semantics. |
| Share Menu Page
sap.m.semantic.ShareMenuPage | An sap.m.semantic.SemanticPage control that supports a Share menu in the footer. |
| Shell
sap.m.Shell | Can be used as root element of applications. It can contain an App or a SplitApp control. The Shell provides some overarching functionality for the overall application and takes care of visual adaptation, such as a frame around the App, on desktop browser platforms. |
| Simple Form
sap.ui.layout.form.SimpleForm | Provides an API for creating simple forms. Inside a SimpleForm control, a Form control is created along with its FormContainers control and FormElements control, but the complexity in the API is removed. |
| Slider
sap.m.Slider | User interface control that allows the user to adjust values within a specified numerical range. |
| Smart Chart
sap.ui.comp.smartchart.SmartChart | <p>Creates a chart based on OData metadata and the configuration specified. The entitySet property must be specified to use the control. This property is used to fetch fields from OData metadata, from which the chart UI will be generated. It can also be used to fetch the actual chart data.</p> <p>Based on the chartType property, this control will render the corresponding chart.</p> <p>i Note</p> <p>Most of the attributes are not dynamic and cannot be changed once the control has been initialized.</p> |
| Smart Field
sap.ui.comp.smartfield.SmartField | A wrapper for other controls. It interprets OData metadata to determine the control that has to be instantiated. The OData entity is derived from the control's binding context. The OData entity's property that is changed or displayed with the control is derived from the control's value property. |

| SAPUI5 Control Name | Description |
|---|---|
| Smart Filter Bar
sap.ui.comp.smartfilterbar.SmartFilterBar | <p>The <code>SmartFilterBar</code> control uses the OData metadata of an entity in order to create a <code>FilterBar</code>.</p> <p>Whether a field is visible on the <code>FilterBar</code>, supports type-ahead and value help, for example, is automatically determined. When you use control configurations and group configurations it is possible to configure the <code>FilterBar</code> and adapt it according to your needs.</p> |
| Smart Form
sap.ui.comp.smartform.SmartForm | Renders a form (<code>sap.ui.layout.form.Form</code>). When used with the <code>SmartField</code> control the label is taken from the metadata annotation <code>sap:label</code> if not specified directly. |
| Smart Link
sap.ui.comp.navpopover.SmartLink | <p>The <code>SmartLink</code> control uses a semantic object to display <code>NavigationPopover</code> for further navigation steps.</p> <p>i Note
Navigation targets are determined using <code>CrossApplicationNavigation</code> of the unified shell service.</p> |
| Smart Table
sap.ui.comp.smarttable.SmartTable | <p>Creates a table based on OData metadata and the configuration specified. The <code>entitySet</code> attribute must be specified to use the control. This attribute is used to fetch fields from OData metadata, from which columns will be generated; it can also be used to fetch the actual table data.</p> <p>Based on the <code>tableType</code> property, this control will render a standard, analytical, tree, or responsive table.</p> |
| Split Pane
sap.ui.layout.SplitContainer | A container of a single control in a responsive splitter. Could be used as an aggregation of a <code>PaneContainer</code> . |
| Splitter Layout Data
sap.ui.layout.SplitterLayoutData | Holds layout data for the splitter contents. Allowed size values are numeric values ending in "px" and "%" and the special case "auto". (The CSS value "auto" is used internally to recalculate the size of the content dynamically and is not directly set as style property.) |
| Standard List Item
sap.m.StandardListItem | List item that provides the most common use cases, such as image, title, and description. |
| Standard Tile
sap.m.StandardTile | Displayed in the <code>Tile</code> container. |
| Switch
sap.m.Switch | User interface control on mobile devices that is used for switching between binary states. |
| Table
sap.m.Table | Provides a set of sophisticated and convenient functions for responsive table design. |
| Text
sap.m.Text | Used for embedding longer text paragraphs that need text wrapping into your application. |
| Text Area
sap.m.TextArea | Allows multiline text input. |
| Tile Container
sap.m.TileContainer | Container that arranges same-size tiles on carousel pages. |

| SAPUI5 Control Name | Description |
|--|--|
| Tile Content
sap.m.TileContent | This control is used within the GenericTile control. |
| Title
sap.ui.core.Title | Used to aggregate other controls. |
| Time Picker
sap.m.TimePicker | A single-field input control that enables the users to fill time related input fields. |
| Toggle Button
sap.m.ToggleButton | Control that toggles between pressed and normal state. |
| Toolbar
sap.m.Toolbar | Horizontal container that is usually used to display buttons, labels, selects, and other input controls. |
| Toolbar Layout Data
sap.m.ToolbarLayoutData | Defines layout data for the sap.m.Toolbar items.

i Note
ToolbarLayoutData should not be used together with sap.m.ToolbarSpacer. |
| Toolbar Separator
sap.m.ToolbarSeparator | Creates a visual separator between toolbar items. |
| Toolbar Spacer
sap.m.ToolbarSpacer | Adds horizontal space between toolbar items. |
| Upload Collection
sap.m.UploadCollection | Allows users to upload single or multiple files. |
| Upload Collection Item
sap.m.UploadCollectionItem | Provides information about uploaded files. |
| Variant Layout Data
sap.ui.core.VariantLayoutData | Allows to add multiple LayoutData to one control in case that an easy switch of layouts (e.g. in a Form) is needed. |
| VBox
sap.m.VBox | Builds the container for a vertical flexible box layout. |
| Vertical Layout
sap.ui.layout.VerticalLayout | Layout in which the content controls are rendered one below the other. |
| XML View
sap.ui.core.mvc.XMLView | A View defined using (P)XML and HTML markup. |

Outline Tab

The SAPUI5 controls listed below are available only from the **Outline** tab in the layout editor.

i Note

This is custom documentation. For more information, please visit the [SAP Help Portal](#)

For more information about SAPUI5 controls, see [UI development toolkit for HTML5 - Demo Kit](#).

SAPUI5 Controls Available on the Outline Tab

| SAPUI5 Control Name | Description |
|-------------------------------------|---|
| sap.m.semantic.AddAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.m.semantic.CancelAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.CloseAction | A semantic-specific button, eligible for the closeAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.f.semantic.CopyAction | A semantic-specific button, eligible for the copyAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.f.semantic.DeleteAction | A semantic-specific button, eligible for the deleteAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.f.semantic.DiscussInJamAction | A semantic-specific button, eligible for the discussInJamAction aggregation of the sap.f.semantic.SemanticPage to be placed in the share menu within its title. |
| sap.m.semantic.DiscussInJamAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage. |
| sap.f.semantic.EditAction | A semantic-specific button, eligible for the editAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.m.semantic.EditAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.ExitFullScreenAction | A semantic-specific button, eligible for the exitFullScreenAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.f.semantic.FavoriteAction | A semantic-specific button, eligible for the favoriteAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.m.semantic.FavoriteAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.m.semantic.FilterAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.m.semantic.FilterSelect | A sap.m.Select control enhanced with styling according to the semantics of a common "Filter" action.

A FilterSelect cannot be used independently but only as aggregation content of a sap.m.semantic.SemanticPage. |

| SAPUI5 Control Name | Description |
|----------------------------------|---|
| sap.f.semantic.FlagAction | A semantic-specific button, eligible for the flagAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.m.semantic.FlagAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.FooterMainAction | A semantic-specific button, eligible for the footerMainAction aggregation of the sap.f.semantic.SemanticPage to be placed in its footer. |
| sap.m.semantic.ForwardAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.FullScreenAction | A semantic-specific button, eligible for the fullScreenAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.m.semantic.GroupAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.m.semantic.GroupSelect | A sap.m.Select control enhanced with styling according to the semantics of a common "Group" action.

A GroupSelect cannot be used independently but only as aggregation content of a sap.m.semantic.SemanticPage. |
| sap.m.semantic.MainAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.MessagesIndicator | A semantic-specific button, eligible for the messagesIndicator aggregation of the sap.f.semantic.SemanticPage to be placed in its footer. |
| sap.m.semantic.MessagesIndicator | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.m.semantic.MultiSelectAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.NegativeAction | A semantic-specific button, eligible for the negativeAction aggregation of the sap.f.semantic.SemanticPage to be placed in its footer. |
| sap.m.semantic.NegativeAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.m.semantic.OpenInAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.PositiveAction | A semantic-specific button, eligible for the positiveAction aggregation of the sap.f.semantic.SemanticPage to be placed in its footer. |

| SAPUI5 Control Name | Description |
|--------------------------------------|--|
| sap.m.semantic.PositiveAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.PrintAction | A semantic-specific button, eligible for the printAction aggregation of the sap.f.semantic.SemanticPage to be placed in the share menu within its title. |
| sap.m.semantic.PrintAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.m.semantic.SaveAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.SendEmailAction | A semantic-specific button, eligible for the sendEmailAction aggregation of the sap.f.semantic.SemanticPage to be placed in the share menu within its title. |
| sap.m.semantic.SendEmailAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.SendMessageAction | A semantic-specific button, eligible for the sendMessageAction aggregation of the sap.f.semantic.SemanticPage to be placed in the share menu within its title. |
| sap.m.semantic.SendMessageAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage. |
| sap.f.semantic.ShareInJamAction | A semantic-specific button, eligible for the shareInJamAction aggregation of the sap.f.semantic.SemanticPage to be placed in the share menu within its title. |
| sap.m.semantic.ShareInJamAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.m.semantic.SortAction | Has default semantic-specific properties and is eligible to be included in the aggregation content of an sap.m.semantic.SemanticPage control. |
| sap.f.semantic.TitleMainAction | A semantic-specific button, eligible for the titleMainAction aggregation of the sap.f.semantic.SemanticPage to be placed in its title. |
| sap.m.Title | Used for header texts and title. |
| sap.m.Token | Renders a token containing text and an optional Delete icon. |
| sap.m.Tokenizer | Displays multiple tokens. |
| sap.suite.ui.commons.BusinessCard | Allows displaying of business card information, including an image, first title (either URL link or text), second title, and multiple text lines. |
| sap.suite.ui.commons.ComparisonChart | Displays a comparison chart. |
| sap.suite.ui.commons.ComparisonData | Comparison tile value holder. |

| SAPUI5 Control Name | Description |
|---|---|
| sap.suite.ui.commons.CountingNavigationItem | Extends the sap.ui.ux3.NavigationItem control. This control displays the number of items in a corresponding content area. It also provides a rich tooltip that appears and disappears after a certain delay. |
| sap.suite.ui.commons.DateRangeScroller | Provides a method to scroll through a series of time periods, each of which is represented by a start date and an end date, known as the date range. |
| sap.suite.ui.commons.DateRangeSliderInternal | Provides the user with a RangeSlider control that is optimized for use with dates. |
| sap.suite.ui.commons.DeltaMicroChart | Displays a delta of two values as a chart. |
| sap.suite.ui.commons.DynamicContainer | Displays multiple GenericTile controls as changing slides. |
| sap.suite.ui.commons.FacetOverview | Used in UnifiedThingInspector to display a preview of facet content. |
| sap.suite.ui.commons.GenericTile | Tile control that displays a title, description, and customizable main area. |
| sap.suite.ui.commons.HarveyBallMicroChart | Chart that shows a comparative part to a total. |
| sap.suite.ui.commons.HarveyBallMicroChartItem | Configuration of a slice on a pie chart. |
| sap.suite.ui.commons.HeaderCell | Contains four cells (West, North, East, South). It can display one or more controls in different layouts. Each aggregation must contain only one instance of HeaderCellItem. |
| sap.suite.ui.commons.HeaderCellItem | Object that contains an instance of a control and information about its height. It should be used inside sap.suite.ui.commons.HeaderCell. |
| sap.suite.ui.commons.HeaderContainer | Container that provides a horizontal layout. On mobile devices, it provides a horizontal scroll. On desktops, it provides scroll left and scroll right buttons. This control supports keyboard navigation. You can use left and right arrow keys to navigate through the inner content. The Home key puts focus on the first control and the End key puts focus on the last control. Use the Enter key or Spacebar key to choose the control. |
| sap.suite.ui.commons.JamContent | Displays SAP Jam content text, subheader, and numeric value in a tile. |
| sap.suite.ui.commons.KpiTile | Used in UnifiedThingInspector to display object-related KPIs in a factsheet. |
| sap.suite.ui.commons.NewsContent | Displays news content text and subheader in a tile. |
| sap.suite.ui.commons.NoteTaker | Allows creation and storage of notes for further reference. |
| sap.suite.ui.commons.NoteTakerCard | Allows storage of NoteTaker card header and body text. |
| sap.suite.ui.commons.NoteTakerFeeder | Allows entering quick notes and note cards. |
| sap.suite.ui.commons.NumericContent | Numeric content to be used in a tile or other place where it is needed to show numeric values with semantic colors and deviations. |
| sap.suite.ui.commons.TileContent | Serves as a universal container for different types of content and footer. |

| SAPUI5 Control Name | Description |
|----------------------------------|--|
| sap.ui.commons.ApplicationHeader | Located at the top of an application page and consists of four areas. |
| sap.ui.commons.Button | Allows users to trigger actions such as save or print. For the button UI, you can define text or an icon, or both. |
| sap.ui.commons.CheckBox | Provides a box that can be flagged and has a label. A checkbox can either stand alone, or be in a group with other checkboxes. |
| sap.ui.commons.ColorPicker | Allows the user to choose a color. The color can be defined using HEX, RGB, or HSV values, or a CSS colorname. |
| sap.ui.commons.FileUploader | Framework that generates an input field and a button with the text Browse.... |
| sap.ui.commons.MenuBar | Represents a user interface area that is the entry point for menus with their menu items. |
| sap.ui.commons.MenuButton | Common button control that opens a menu when chosen by the user. The control provides an API for configuring the docking position of the menu. |
| sap.ui.commons.Paginator | Provides navigation between pages within a list of numbered pages. |
| sap.ui.commons.Panel | Represents a container with scroll functionality that can be used for text and controls. |
| sap.ui.commons.PasswordField | Text field with masked characters that borrows its properties and methods from the TextField control. |
| sap.ui.commons.ProgressIndicator | Shows the progress of a process in a graphical way. |
| sap.ui.commons.RadioButton | Consists of a round element and descriptive text. |
| sap.ui.commons.RangeSlider | Interactive control that is displayed either as a horizontal or vertical line with two pointers and units of measurement. |
| sap.ui.commons.RatingIndicator | Allows the user to rate a certain topic. |
| sap.ui.commons.SegmentedButton | Provides a group of buttons. |
| sap.ui.commons.Slider | Interactive control that is displayed either as a horizontal or vertical line with a pointer and units of measurement. |
| sap.ui.commons.Splitter | Allows splitting the screen into two areas. |
| sap.ui.commons.TextArea | Control for entering or displaying multiple rows of text. |
| sap.ui.commons.TextField | Renders an input field for text input. |
| sap.ui.commons.Toolbar | Horizontal row of items where in many cases the single toolbar items are buttons that contain icons. |
| sap.ui.commons.Tree | Simple tree for displaying an item in a hierarchical way. |
| sap.ui.commonsTreeNode | Tree node element. |
| sap.ui.layout.FixFlex | Builds the container for a layout with a fixed and a flexible part. |
| sap.ui.layout.form.FormLayout | Base layout used to render a Form control. |
| sap.ui.layout.form.GridLayout | Renders a Form control using an HTML table-based grid. |

| SAPUI5 Control Name | Description |
|---|---|
| sap.ui.layout.form.ResponsiveGridLayout | Renders a Form control using a responsive grid. |
| sap.ui.layout.form.ResponsiveLayout | Renders a Form control with a responsive layout. |
| sap.ui.layout.ResponsiveSplitter | A responsive splitter which divides the application into several areas. |
| sap.ui.unified.Currency | Text view that displays currency values and aligns them at the separator. |
| sap.ui.unified.FileUploader | Framework that generates an input field and a button with the text Browse |
| sap.ui.unified.FileUploaderParameter | Represents a parameter for the FileUploader, which is rendered as a hidden input field. |
| sap.ui.unified.Menu | Interactive element that provides a choice of different actions to the user. |
| sap.ui.unified.MenuItem | Standard item used inside a menu. Represents an action that can be selected by a user in the menu or that can be used as a submenu that organizes the actions hierarchically. |
| sap.ui.unified.ShellOverlay | Opened in front of an sap.ui.unified.Shell control. |
| sap.ui.unified.SplitContainer | Provides a main content and a secondary content area. |
| sap.ui.ux3.ExactArea | Consists of two sections: a toolbar and a content area where arbitrary controls can be added. |
| sap.ui.ux3.FeedChunk | Unit that is embedded, standalone or multiple, into a Feed control. |
| sap.ui.ux3.Feeder | Lean common feed, or a comment feed, with a text commit function. |
| sap.uxap.ObjectPageHeader | Static part of an Object page header. |
| sap.uxap.ObjectPageHeaderContent | Dynamic part of an Object page header. |

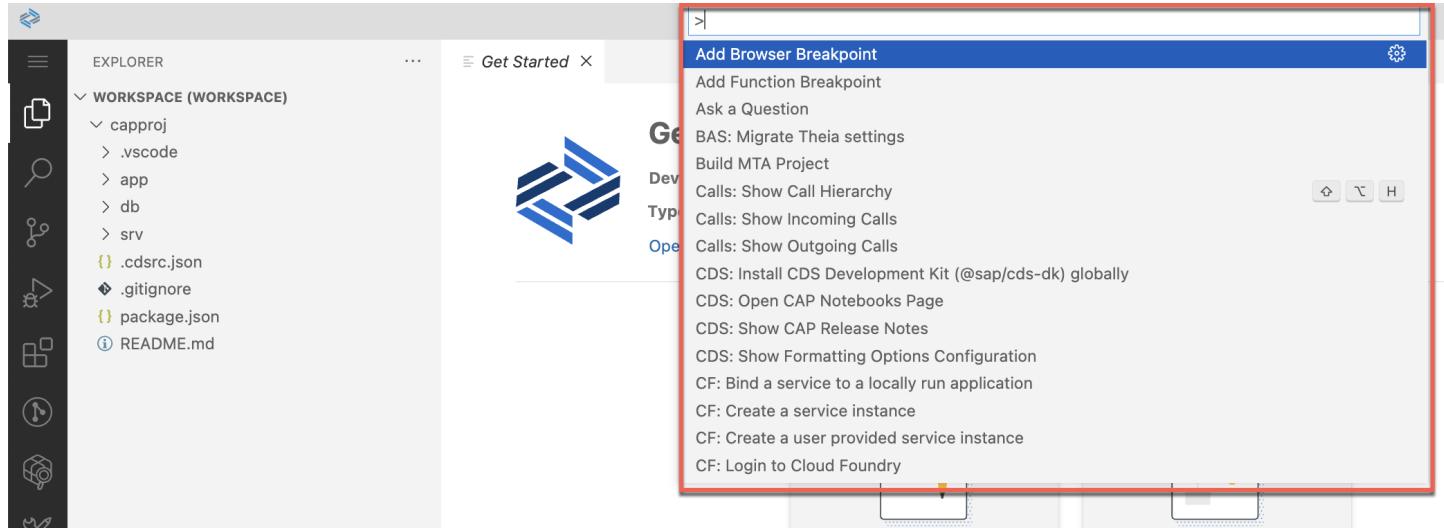
Command Palette

The command palette provides access to all the IDE functionality including shortcuts for the most common operations.

To open the command palette, select **View > Command Palette...** from the left-side menu or press **F1** (Windows/Linux) or **Command + Shift + P** (Mac).

This will open an input field at the top of the IDE allowing you to type a command. Content assist then allows you to find commands quickly.

Some commands will lead you into a minimal text-based wizard, allowing you to enter additional parameters.



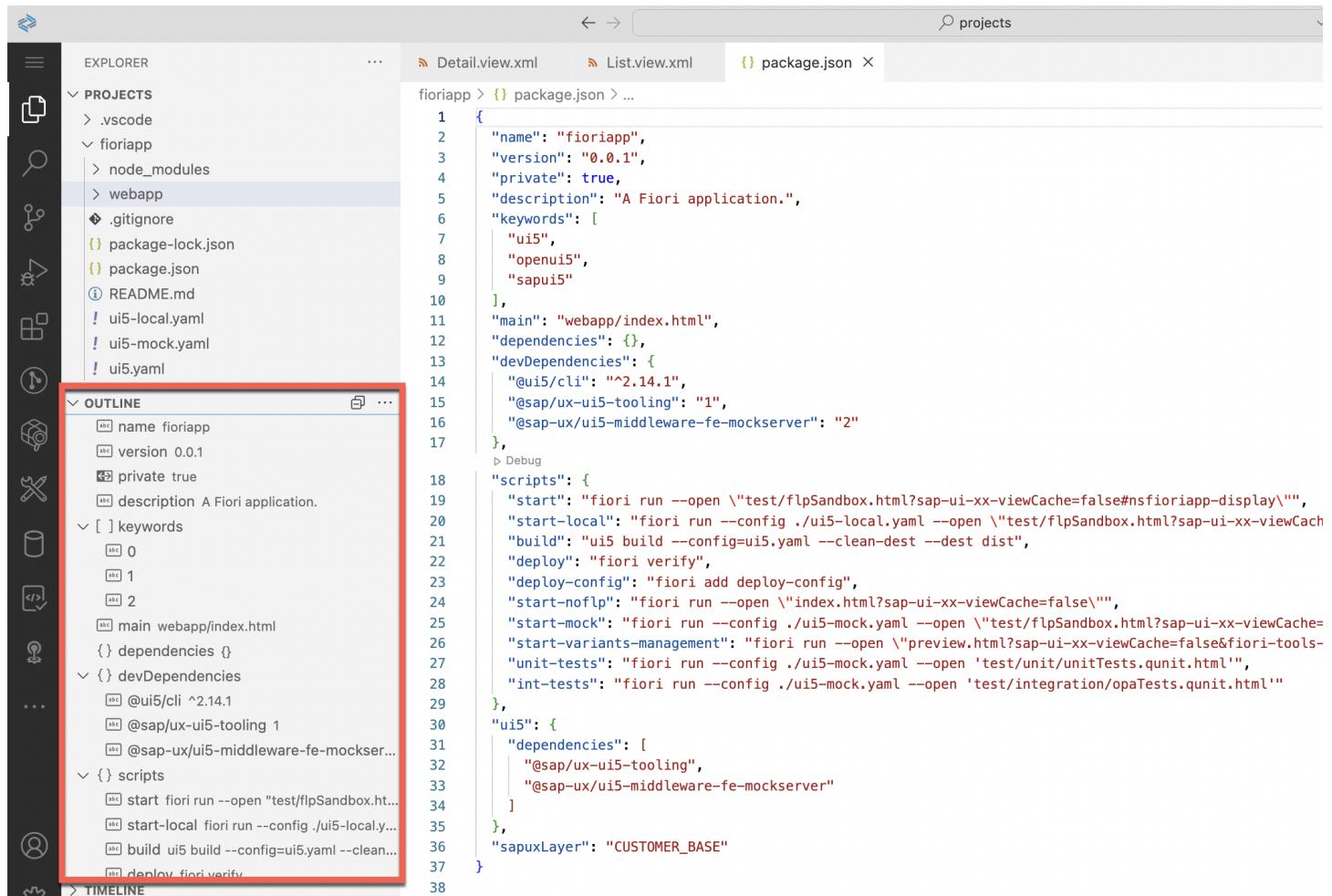
Outline View

The Outline view displays a symbol tree of the currently active editor. This view is useful for understanding the structure of a file or for navigating to a specific element in a file.

You can click on an element in the Outline view to open that element in the editor tab.

To open the Outline view, select [Explorer: Focus on Outline View](#) from the command palette.

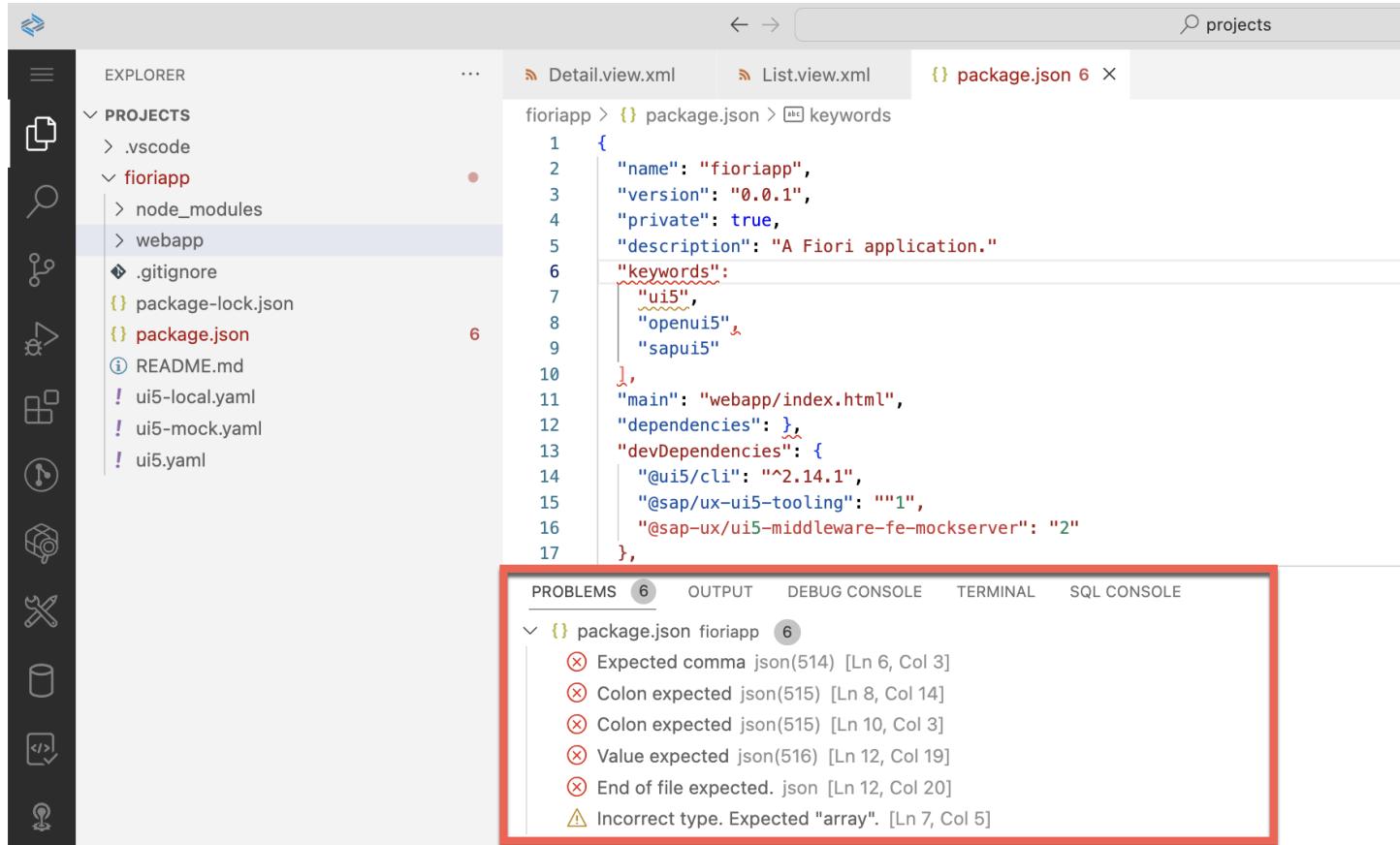
The Outline view opens on the left side of the IDE, within the Explorer view.



Problems View

The Problems view displays the coding errors and warnings of all open files in a list. When you click an item from the list, the problematic piece of code is highlighted in the editor.

From the left-side menu, select **View > Problems** to open the Problems view.

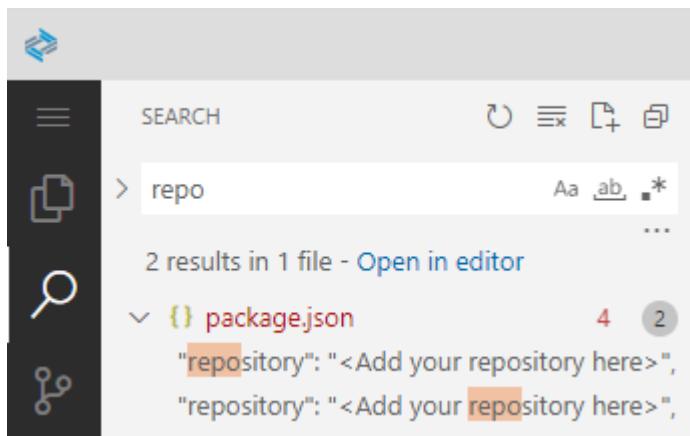


Search

There are different Search capabilities in SAP Business Application Studio.

You can perform a search from the Search view or from the Find widget in the editor.

- To open the Search view, select **View > Search** from the left-side menu.



- To open the Find widget within a file, press **Ctrl+F**.

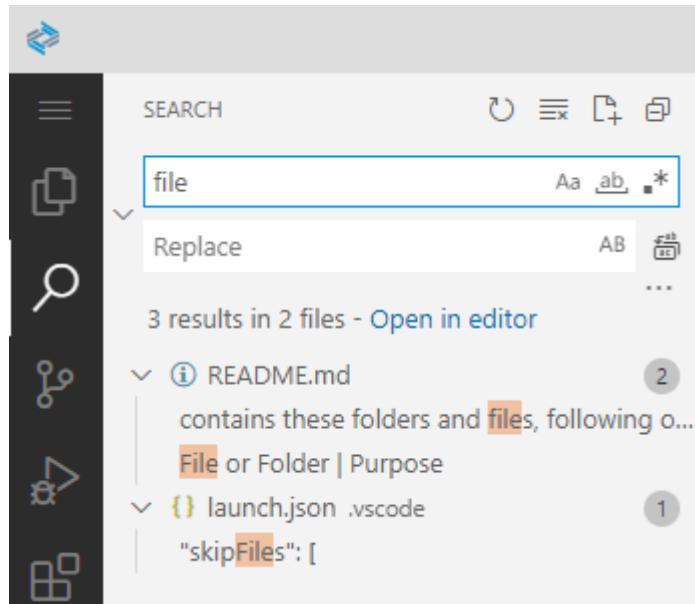
```

1 { "name": "Project2",
2   "version": "1.0.0",
3   "description": "A simple CAP project.",
4   "repository": "<Add your repository here>",
5   "license": "UNLICENSED",
6   "private": true,
7   "dependencies": {
8     "@sap/cds": "^6".
9   }

```

The screenshot shows the SAP IDE Editor interface. At the top, there's a navigation bar with tabs for 'package.json' and 'package.json > ...'. Below the tabs is a search bar with the word 'Find' and a 'No results' message. To the right of the search bar are icons for navigating between files and a minimap. The main area displays the content of the 'package.json' file. The code editor shows several lines of JSON configuration, with the first line starting with a brace '{' highlighted.

Find and Replace



You can find text and replace in the currently opened file. The search results will be highlighted in the editor, overview ruler, and minimap.

If there is more than one matched result in the current opened file, you can press **Enter** and **Shift+Enter** to navigate to next or previous result when the find input box is focused.

When the Find Widget is open, it will automatically populate the selected text in the editor into the find input box. If the selection is empty, the word under the cursor will be inserted into the input box instead.

Find In Selection

By default, the find operations are run on the entire file in the editor. It can also be run on selected text. You can turn this feature on by clicking the hamburger icon on the Find Widget.

Multiline support

You can search text in multiple lines by pasting it into the **Find** input box. Pressing **Ctrl+Enter** inserts a new line in the input box.

Resize Find Widget

You can drag the left sash of the Find Widget to enlarge it. You can also double-click the left sash to maximize it or shrink it to its default size.

Search across files

You can search over all files in the currently opened folder. Press **Ctrl+Shift+F** and enter your search term. Search results are grouped into files containing the search term, with an indication of the hits in each file and its location. Expand a file to see a preview of all of the hits within that file. Then single-click on one of the hits to view it in the editor.

Advanced search options

In the input box below the search box, you can enter patterns to include or exclude from the search.

If you enter a word, a search will be performed on every folder and file with the name of the word you entered in the workspace.

If you enter `./` before the word, that will match the folder name at the top level of your workspace.

Use an exclamation mark `!` to exclude those patterns from the search.

Use a comma `,` to separate multiple patterns.

Paths must use forward slashes.

You can also use glob syntax:

- `*` to match one or more characters in a path segment
- `?` to match one character in a path segment
- `**` to match any number of path segments, including none
- `{}` to group conditions (for example `{**/* .html, **/* .txt}` matches all HTML and text files)
- `[]` to declare a range of characters to match

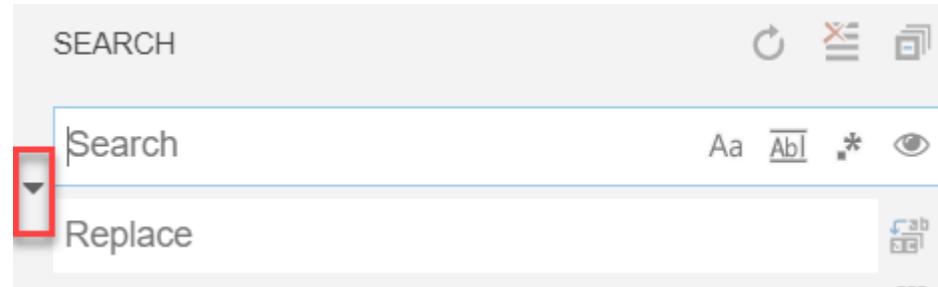
Some folders are excluded by default to reduce the number of search results that you are not interested in (for example, `node_modules`). Open settings to change these rules.

Also note the **Use Exclude Settings** and **Ignore Files** toggle button in the **files to exclude** box. The toggle determines whether to exclude files that are ignored by your `.gitignore` files and/or matched by your `files.exclude` and `search.exclude` settings.

From the Explorer, you can right-click on a folder and select **Find in Folder** to search inside a folder only.

Search and replace

You can search and replace across files. Expand the **Search** input field to display the **Replace** one.



When you type text into the Replace input field, you will see a diff display of the pending changes. You can replace across all files from the Replace input field, replace all in one file or replace a single change.

Advanced Search and Replace Options

In addition to search and replace with plain text, there are also advanced search options:

This is custom documentation. For more information, please visit the [SAP Help Portal](#)

- Match Case
- Match Whole Word
- Regular Expression
- Include Ignored Files

Test and Run

Once you have finished coding, you can test and run your application.

[Creating Run Configurations](#)

Create run configurations that define how your project or unit test is executed.

[Application Preview Settings](#)

Each application runs on a specific port. If you want to open a new browser tab with your running application, use the Ports: Preview command.

[Cloud Foundry Tools](#)

Connect and perform actions on the Cloud Foundry environment.

[Debugging](#)

SAP Business Application Studio has built-in debugging support for the Node.js runtime and can debug JavaScript, TypeScript, or any other language that gets transpiled to JavaScript.

Creating Run Configurations

Create run configurations that define how your project or unit test is executed.

SAP Business Application Studio provides default run configurations for your projects. You can create and configure additional run configurations that define how your project or unit test is executed. You can also create a new run configuration by duplicating an existing run configuration and then editing it.

Clicking  (Run and Debug) on the right-hand side of the header provides one of the following options:

- If there is a default run configuration that's created during project creation, this configuration runs.
- If you add a new configuration and run it, this configuration runs.
- If you add multiple configurations, the last configuration that you ran runs.
- If you have run configurations from multiple projects, you can choose which configuration to run.

Related Information

- [Creating Run Configurations for Java Modules](#)
- [SAP Fiori tools- Create a New Run Configuration in SAP Business Application Studio](#)
- [Creating Run Configurations for CAP Java Modules](#)
- [Creating Run Configurations for CAP Node Applications](#)

Creating Run Configurations for Java Modules

Create new run configurations to run a Java module for a multitarget application.

Run a Java module on the local Apache Tomcat server and allow binding the module's required resources to specific Cloud Foundry services.

Prerequisites

- Your project must include an `mta.yaml` file that points to the Java module.
- The Java module's `pom.xml` file must include the following definition: `packagingType= war`.

Add a New Configuration

1. Click  from the activity bar to open the **Run Configurations** view.

2. Click  (Create Configuration).



3. Select the Java module as the runnable object.

A new configuration is added to your `launch.json` file.

Note

Any manual change performed to the `launch.json` file is reflected in the configuration tree.

Bind Dependencies

In the **Run Configurations** view, you can see the resources that are defined in the MTA descriptor. You can bind or unbind these resources to a specific Cloud Foundry service instance.

Note

The following Cloud Foundry service types are supported for binding:

- `hana` (`managed-hana` isn't supported)
 - PSA-based SAP HANA
 - HaaS (if configured as "Available for all IPs")
- `xsuaa`
- `destination`
- `connectivity`
- `auditlog`
- `application-logs`

To bind the resource:

1. Open the **Run Configurations** view.
2. Select the desired configuration.

3. Select the desired resource.

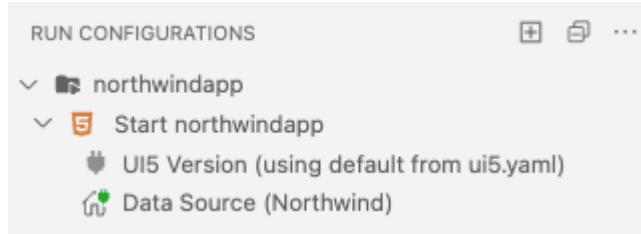
4. Click  (bind).

If not already logged in, you're prompted to log in to Cloud Foundry.

A list of all available services that match your resource type are displayed in the command palette.

5. Select the desired service.

The resource is bound to the service.



This updates the resource's configuration files. See the [Advanced Options](#) section below to see the changes made to the configuration files.

If you're binding to an SAP HANA service, a new connection called '<my_service_instance_name>' is added to the SQLTools view where your tables and data are displayed.

Unbinding the resource removes all of the changes made to the configuration files.

To unbind the resource:

1. Open the [Run Configurations](#) view.

2. Select the desired configuration.

3. Select the desired resource.

4. Click  (unbind).

Run a Configuration

1. If you bound your service to a service that requires Chisel to run:

a. In the command palette, enter Tasks and select [Tasks: Run Task](#).

b. Select `openChiselTunnelFor -<service name>`.

Note

If Chisel is already running in the same port and space, skip this step.

2. Select the desired run configuration.

3. Click  (Run) to run the project.

Prelaunch and dependent tasks are run.

The Debug Console opens.

4. Click [Open in New Tab](#) to view the UI in a new tab.

5. If you need to stop a configuration that is already running, you can do so from the [Run and Debug](#) view.

i Note

For more information about the tasks triggered by the run configuration, see the [Advanced Options](#) section below.

Stopping a configuration from the [Run and Debug](#) view doesn't stop any running tasks.

Edit a Run Configuration

1. Right-click a relevant run configuration to do the following:

- o [Configure Environment](#) - Open the environment file to view the binding configuration.
- o [Rename](#) - Provide a new name for the selected run configuration.
- o [Show in File](#) - Open the JSON file containing the set of configuration properties, with the name highlighted.
- o [Delete](#) - Delete the set of configuration properties from the JSON file.

Delete a Run Configuration

1. Right-click a run relevant configuration and choose [Delete](#).

i Note

If you delete the launch configuration, it's removed from the `launch.json` file but the tasks remain.

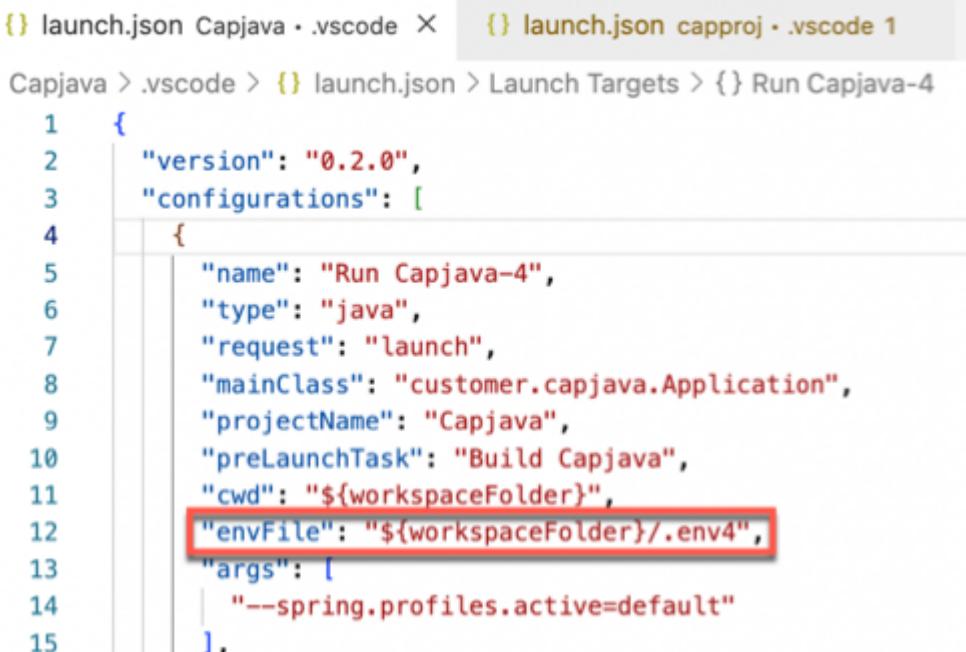
Advanced Options

In addition to the `launch.json` file that is created as part of the new configuration, the following files are added or updated when creating a run configuration:

- [Environment configuration file](#)

A new environment file is created. After the resource is bound to a service, the file is populated with all the environment variables required to connect to Cloud Foundry.

The environment configuration file is referenced from your Launch configuration.



```

1  {
2    "version": "0.2.0",
3    "configurations": [
4      {
5        "name": "Run Capjava-4",
6        "type": "java",
7        "request": "launch",
8        "mainClass": "customer.capjava.Application",
9        "projectName": "Capjava",
10       "preLaunchTask": "Build Capjava",
11       "cwd": "${workspaceFolder}",
12       "envFile": "${workspaceFolder}/.env4",
13       "args": [
14         "--spring.profiles.active=default"
15     ],

```

- [New tasks in the tasks.json file](#)

The following tasks are added to the tasks.json file:

- A technical generic task. This is the configuration's prelaunch task.

This task enables you to define additional tasks to run before starting the configuration (using the dependsOn property).

```
"tasks": [
  {
    "label": "run-cloud-sample-spaceflight-java-srv-1",
    "type": "shell",
    "command": "echo 'Run cloud-sample-spaceflight-java-srv'",
    "dependsOn": [
      "run-tomcat-cloud-sample-spaceflight-java-srv-1"
    ]
}
```

- A task that triggers the Apache Tomcat server running with the context of the application resources.
- A build task that triggers the mvn clean install command.

- **Tomcat runtime configuration directory**

When you create a new configuration, a new **Tomcat runtime configuration directory** is created containing the following configuration files:

- ROOT.xml (user/.tomcat/<configuration_name>/Catalina/localhost)

For example, /home/user/.tomcat/bookshop-srv-1/conf/Catalina/localhost

- server.xml (user/.tomcat/<configuration_name>/conf)

For example, /home/user/.tomcat/bookshop-srv-1/conf

i Note

By default, Tomcat runs on port 8080. If you want to run multiple configurations at the same time, you need to configure a different port for the additional Tomcat in the server.xml file. In addition, you need to change the default ports 8009 and 8005 defined in this file to other ports to avoid collision.

You also need to define a debug port (that isn't the default 8000), both in the 'run-tomcat' task in the tasks.json file, and in the matching launch configuration in the launch.json file, which are all associated with the same run configuration.

You can modify the content of this directory to configure Tomcat as desired for this run configuration. For example, you can add libraries to be used at runtime or change ports. For more information, see [Apache Tomcat](#).

Binding Process

Not all of the services that you want to bind to are publicly exposed. Therefore, we must use a secure tunnel to access them from Cloud Foundry.

When binding to one of these services, we use [chisel](#) to open a secure channel to your Cloud Foundry space.

A new task is created within the binding step to run chisel. Run this task before running the configuration.

The environment configuration file is updated with the chisel and the selected service parameters.

The Tomcat configuration files are updated according to the chosen service.

Application Preview Settings

Each application runs on a specific port. If you want to open a new browser tab with your running application, use the Ports : Preview command.

Previewing Ports

1. Enter the Ports : Preview command in the command palette.

A list of all the exposed applications is displayed.

2. Click the relevant application.

The exposed application opens in a new tab.

Configuring Port Notification Settings

You can define which ports should omit a notification when an application is being run.

1. In SAP Business Application Studio, click  to open the **Settings** view.
2. Search for **Ports**.
3. From the list of preferences, select **Ports**.
4. Under **Exclude Expose Notifications** click **Edit in settings.json**.
5. Specify the port or range of ports for which you do not want to show a notification.
6. Save your changes.

Cloud Foundry Tools

Connect and perform actions on the Cloud Foundry environment.

You can access the Cloud Foundry tools by opening the command palette and entering CF. You can also create a list of pre-defined targets using the **CLOUD FOUNDRY: TARGETS** view.

Login to Cloud Foundry

You must be logged in to Cloud Foundry to use the Cloud Foundry Tools.

1. In the command palette, select CF: Login to Cloud Foundry. The **Cloud Foundry Sign In and Targets** page opens.
 2. Select the type of authentication method you prefer.
- See [Connecting to Cloud Foundry Using Identity Providers](#).
3. Depending on the method you selected, enter your username and Cloud Foundry password or your temporary SSO authentication code.
 4. Select the organization to which you want to connect.
 5. Select the desired space within the organization.

Click on the status bar to change the target.

Select Cloud Foundry Target

1. Select the organization to which you want to connect.
2. Select the desired space within the organization.
3. Click **Apply**.

Set Org and Space

You can change the organization and space you defined when logging into Cloud Foundry.

1. In the command palette, select CF: Select a space from your allowed spaces. The **Cloud Foundry Sign In and Targets** page opens.
2. Select the organization to which you want to connect.
3. Select the desired space within the organization.

Create a New Service Instance

Create service instance in your current Cloud Foundry org and space. You can later consume this service for your development needs.

1. In the command palette, select CF: Create a service instance.
2. Provide a service instance name. The name must be unique, if you enter an already existing name, the creation fails.
3. Select a Cloud Foundry service.
4. Select the service plan that best fits your service instance.
5. Optional: Provide additional parameters for the service instance. You can also press **Enter** to enter an empty parameter.

Note

You can create a service instance in the **CLOUD FOUNDRY: TARGETS** view. The **CLOUD FOUNDRY: TARGETS** view opens.

1. Click  from the activity bar.
2. Click  (**Create a service instance**) next to the **Services** folder under the active target.

Create a User-Provided Service Instance

With a user-provided service instance, you can use services that are not available in the marketplace.

1. From the activity bar, click . The **CLOUD FOUNDRY: TARGETS** view opens.
2. Click  next to the **Services** node under the active target.



3. In the command center, provide a service instance name. The name must be unique, if you enter an already existing name, the creation fails.
4. Select a Cloud Foundry service.
5. Select the service plan that best fits your service instance.
6. Optional: Provide additional parameters for the service instance. You can also press **Enter** to enter an empty parameter.

Bind a Service to a Locally Run Application

1. In the command palette, select **CF: Bind a service to a locally run application**.
2. Select the folder where the **.env** file will be created. This file contains the information for connecting to the Cloud Foundry service.
3. Click **OK**.
4. Select the service instance to which you want to bind.

i Note

You can also bind a service to an application using the **CLOUD FOUNDRY: TARGETS** view by right-clicking on the desired service and clicking **Bind a service to a locally run application**.

Create a New Cloud Foundry Target

You can create a list of frequently used Cloud Foundry targets. You can then move from one target to the next with only one click.

1. From the left side menu, click **The CLOUD FOUNDRY: TARGETS** view opens. The **CLOUD FOUNDRY: TARGETS** view opens.
2. Click **[+]** (Create a Cloud Foundry target)
3. Click **Create New** in the command center. The target is based on the current org and space to which you are connected.
4. Provide a name for the target.

You can change the current target in three different ways:

- Log in to Cloud Foundry using a different endpoint.
- Select a different organization and space within the current endpoint.
- Select a different space within the current organization.

Once you have set up your targets, you can define which one will be the active target by clicking **[→] (Set Cloud Foundry Target)** by the desired target name.

Reload the Targets Tree

If the target tree is not showing updated information, you can manually trigger a reload to refresh the view.

1. In the command palette, select CF: Reload Targets Tree.

Connecting to Cloud Foundry Using Identity Providers

Connect to Cloud Foundry using the UI or the command line.

The manner in which you can connect to Cloud Foundry depends on the identity provider (IdP) you use.

Cloud Foundry Sign In and Targets

Provide your Cloud Foundry parameters to sign in to the Cloud Foundry environment

Cloud Foundry Sign In

Enter Cloud Foundry Endpoint *

`https://api.cf.us10.hana.ondemand.com`

Select authentication method [?](#)

Credentials SSO Passcode

Enter your username *

User ID

Enter your password *

Sign in

Comparison Between the Different Identity Providers for Cloud Foundry Login in SAP Business Application Studio

| | SAP ID Service | Custom IdP | Corporate IdP |
|---|--|--|---|
| SAP Business Application Studio UI-based login with username and password | Supported | Not supported | Not supported |
| SAP Business Application Studio UI-based SSO login | Supported | Supported | Supported |
| SAP Business Application Studio CLI-based login | Supported | Supported | Supported |
| CLI-based login example

user: project \$ cf login
API endpoint: https://api.
Email:
[REDACTED] | Reference

<code>cf login</code> | Reference

<code>cf login --origin <origin></code> | Reference

<code>cf login --sso</code> |
| Authorization flow | OAuth Resource Owner Password | OAuth Resource Owner Password | OAuth Authorization Code Grant (browser flow) + One-Time Passcode |

For more information, see [this blog](#).

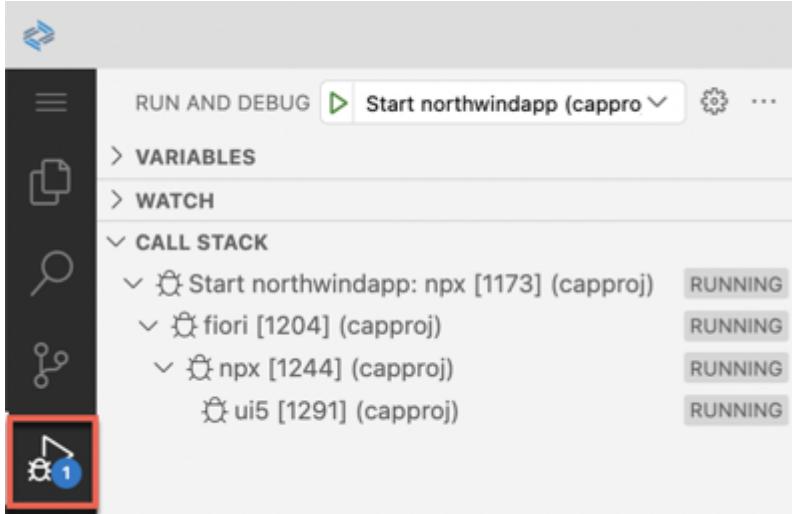
Debugging

SAP Business Application Studio has built-in debugging support for the Node.js runtime and can debug JavaScript, TypeScript, or any other language that gets transpiled to JavaScript.

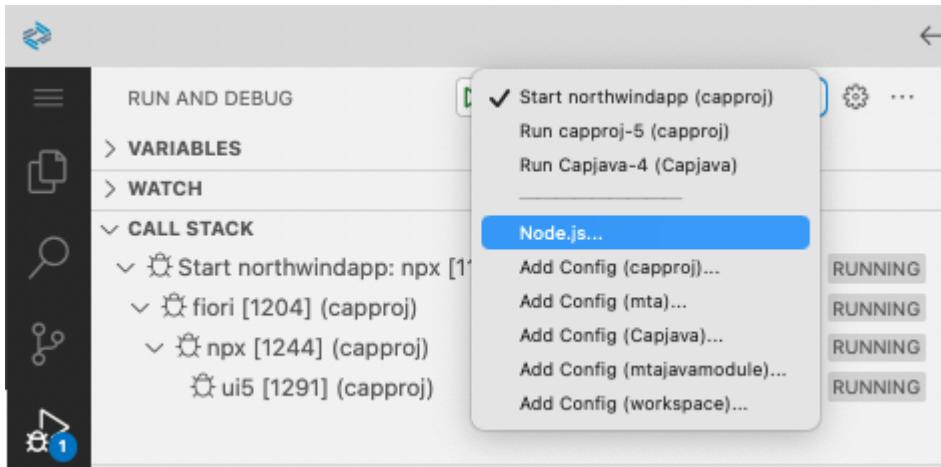
Debugging a File

To debug a node.js file:

1. Open the Run and Debug view.



2. Open the dropdown list to select the relevant configuration.



A list of configuration options is displayed.

3. Select **Node.js**. A launch configuration file (`launch.json`) is created automatically. You can configure and save debugging setup details in this file.

This file contains 3 configurations:

- Launch Program
- Create JavaScript Debug Terminal
- Run Current File

4. To add a new configuration to an existing `launch.json`, from the dropdown list, select **Add Configuration**.

5. From the dropdown list, select **Run Current File** or **Launch Program** (which provides you the option to skip node internal files).

You can run your configuration through the command palette, by filtering on [Debug: Start Debugging](#).

i Note

Note that the attributes available in launch configurations vary from debugger to debugger.

Debugging Modes

There are two core debugging modes, Launch and Attach.

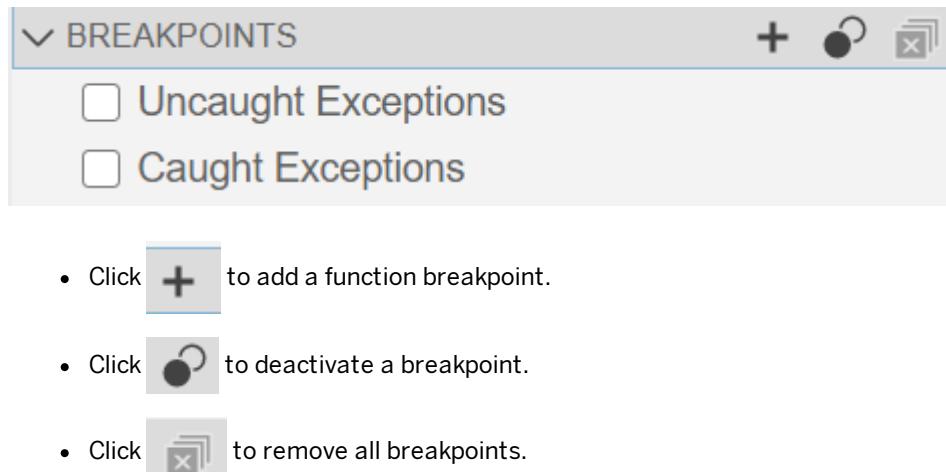
The debugger can launch a program in debug mode, or it can attach to an already running program in debug mode.

You can trigger these modes from the command palette: [Debug : Attach to Node Process](#)

Breakpoints

Breakpoints can be toggled by clicking on the editor margin or using [F9](#) on the current line.

You can also use the BREAKPOINTS section.



Build and Deploy

Use our dedicated tools to build and deploy your application.

Use the SAP Business Application Studio development tools for working with multitarget applications. See [MTA Development](#).

You can also find documentation for scenario-specific deployment options.

- If you want to deploy an SAP Fiori application, see [Deploy an Application](#).
- If you want to deploy an SAP HANA application, see [Maintaining the Multitarget Application Development & Deployment Descriptors](#).

MTA Development

Learn how to use the SAP Business Application Studio development tools for working with multitarget applications.

MTA Tools

The MTA Tools allow you to perform operations such as build, deploy, and validation on multitarget applications.

The MTA Tools are provided as an extension to SAP Business Application Studio and contains the following:

Cloud Foundry CLI

The Cloud Foundry Command Line Interface provides commands to deploy and manage CF services and applications.

For more information, see [Using the Cloud Foundry Command Line Interface](#).

Cloud MTA Build Tool

The Cloud MTA Build Tool is a standalone command-line tool that builds a deployment-ready multitarget application (MTA) archive .mtar file from the artifacts of an MTA project according to the project's MTA development descriptor (mta.yaml file), or from the module build artifacts according to the MTA deployment descriptor (mtad.yaml file).

For more information, see the [Cloud MTA Build Tool](#) user guide.

Cloud Foundry CLI MTA Plugin

A CLI plugin for Multitarget Application (MTA) operations in Cloud Foundry.

For more information, see the [documentation](#).

Cloud Foundry Targets Plugin

This plugin facilitates the use of multiple API targets with the Cloud Foundry CLI.

For more information, see the [documentation](#).

Cloud Foundry CLI Copy Env Plugin

A Cloud Foundry CLI plugin to export application VCAP_SERVICES and VCAP_APPLICATION onto the local machine.

For more information, see the [documentation](#).

generator-basic-multitarget-application

The generator-basic-multitarget-application is a Yeoman generator for creating a basic (empty) multitarget application.

cf-cli-service-info-plugin

The cf-cli-service-info-plugin is a Cloud Foundry plugin which enables the following:

- Provides service key details.
- Provides service credentials.
- Calculates a VCAP_SERVICES json, compatible with how Cloud Foundry binds services to apps and persists to file.

Chisel

Chisel is a fast TCP tunnel, transported over HTTP, secured via SSH.

For more information, see the [documentation](#).

MTA Editor

The visual MTA editor allows you to edit the MTA descriptor (the `mta.yaml` file located in the root project folder) using tables and forms instead of the text-based code editor.

The multitarget application (MTA) descriptor contains the metadata of all entities comprising an application or used by it during deployment or runtime, and the dependencies between them.

The MTA descriptor is automatically generated when an application project is created from scratch, and it is updated when the project properties change or when a module is added or removed. However, not all the necessary information can be generated automatically. You need to maintain the descriptor manually to define resources, properties, and dependencies, as well as fill in missing information.

The MTA descriptor is written in the YAML format, which has strict syntax requirements. You can edit the descriptor in the text-based code editor, but we recommend you use the visual MTA editor. The visual MTA editor allows you to easily navigate between the objects in the `mta.yaml` file and helps you avoid dealing with the complex and sensitive syntax of YAML files.

To open the visual MTA Editor:

1. Right-click the desired `mta.yaml` file.
2. Choose  [MTA Editor](#).

i Note

The visual MTA editor removes comments and formats the file. If you want to add comments, use the code editor. To open the code editor, double-click on the desired `mta.yaml` file or right-click the file and choose  [Code Editor](#).

If you edit the file with the code editor, it is important to use spaces rather than tabs for indentation.

Related Information

[The Multi-Target Application Model](#)

[SAP Business Application Studio Multitarget Application \(MTA\) development toolkit](#)

Building and Deploying Multitarget Applications

Build and deploy multitarget applications to SAP Cloud Foundry.

Building Multitarget Applications

Prerequisites

- Your dev space must contain a multitarget application.

There are several ways for building multitarget applications in SAP Business Application Studio:

- From the context menu.
 1. Right-click on the `mta.yaml` file.
 2. Choose **Build MTA Project**.
- From the command palette.
 1. Enter MTA.
 2. Choose **Build MTA Project**.
 3. Select the desired `mta.yaml` file.

i Note

If there's only one `mta.yaml` available, the build starts automatically.

- From the **Task Explorer**.
 1. From the activity bar, click  to open the **Task Explorer** view.
 2. Click **+** (Create Task).
 3. Click **Build**.
 4. Select the MTA project descriptor of the project you want to build.
 5. Click **Configure** to edit the build configuration parameters.
 6. Save your changes.

Use the **Task Explorer** to change the default MTA Build options, for example, to change the default location of the MTA archive or to provide an MTA extension for the build. In the **Task Explorer**, you can save this build configuration for later use.

- From the CLI. See [Cloud MTA Build Tool](#).

The terminal opens showing the output of the build. Once the build is complete, a folder named `mta_archives` is added to the project that contains the relevant MTA archive (MTAR file).

i Note

If you changed the default configurations using the Task Explorer, the output will correspond to the specified build parameters.

Deploying Multitarget Applications

Prerequisites

- You must be logged on to a Cloud Foundry organization and space. See [Cloud Foundry Tools](#).
- You must have permissions to deploy to your Cloud Foundry space.
- Your dev space must contain a multitarget application.
- Your project must contain an MTA archive (MTAR) file.

There are several ways for deploying multitarget applications to SAP Cloud Foundry:

- From the context menu.

1. Right-click on the relevant MTAR file.
 2. Choose **Deploy MTA Archive**.
- From the command palette.
 1. Enter MTA.
 2. Choose **Deploy MTA Archive**.
 3. Select the desired MTAR file.

i Note

If there's only one MTAR file available, the deployment starts automatically.

- From the **Task Explorer**.

1. From the activity bar, click  to open the **Task Explorer** view.
2. Click **+** (Create Task).
3. Click **Deploy**.
4. Select the MTA archive of the project you want to build.
5. Click **Configure** to edit deployment configuration parameters.
6. Save your changes.

Use the **Task Explorer** to change the default MTA deploy options. In the **Task Explorer**, you can save this configuration for later use.

- From the CLI. See [Deploy Commands](#) .

The terminal opens showing the output of the deploy process.

Continuous Integration and Delivery

SAP Continuous Integration and Delivery lets you configure and run predefined continuous integration and delivery (CI/CD) pipelines that automatically build, test, and deploy your code changes to speed up your development and delivery cycles.

Prerequisites

Perform the following configuration steps to use SAP Continuous Integration and Delivery in SAP Business Application Studio:

1. You must subscribe to the **Continuous Integration & Delivery** service, assign the required roles and permissions, add the relevant service plan, and add the relevant instance.

See [Initial Setup](#) in the SAP Continuous Integration and Delivery documentation or run the [Get Started with SAP Business Application Studio](#) booster to automate these steps. See [Initial Setup](#) in the Developing Business Applications Using Productivity Tools documentation.

2. In the SAP BTP cockpit, make sure to check that you have the following:

- A subscription to **SAP Business Application Studio** and **Continuous Integration & Delivery**.
- An instance for SAP Continuous Integration and Delivery.

If you ran the booster, the instance name is **default_cicd-service**. If you completed the manual steps, the instance name is the name that you chose.

See [Enabling the API Usage](#).

3. Open a dev space in SAP Business Application Studio.

4. Open a project in the terminal.

5. Enter the following command to get the space GUID:

```
cf space dev --guid
```

6. Open the **Continuous Integration & Delivery** service from the SAP BTP cockpit.

7. In SAP Continuous Integration and Delivery, click  (Settings).

8. Click  (Add space to allow list), enter the space GUID that you obtained in Step 5, and click **OK**.

9. Click **Save**.

10. In the SAP BTP cockpit, navigate to  .

11. Click **New Destination**.

12. Click the **Service Instance** tab and create a destination with the following configurations:

| Property | Value |
|---|--------------------------------|
| Service Instance | <the instance created earlier> |
| Name | cicd-backend |
|   | true |

13. Click **Next**.

14. Leave the default values, but change **Authentication** to **OAuth2UserTokenExchange** and click **Save**.

15. Create a new dev space or restart your existing dev space to use the SAP Continuous Integration and Delivery service.

Procedure

The **CI/CD** view in SAP Business Application Studio, allows you to see all jobs configured for the current project, as long as the project is connected to a Git repository.

You can create a job for your project using a CI/CD pipeline.

1. From the left-side menu, select  .

2. Search for **Guide Center: Create a CI/CD Job**. Select the guide and follow the instructions.

Each job is configured using a `config.yaml` file in the project Git repository.

The **CI/CD** view shows the latest build triggered by the user. To see all builds, open the SAP Continuous Integration and Delivery service. See [SAP Continuous Integration and Delivery](#) to learn about this service. You can see the build details for each job, such as the creation date and status.

Once a new build is triggered, the view is updated with the latest build.

From the job's context menu, you can:

- See the build steps and logs.

Click [View Build Log](#) to open.

- Manually trigger a build.

Click [Trigger a Build](#). The best practice is to use Git webhooks to automatically trigger a build with each build action. Nevertheless, you can manually trigger a build without pushing changes to Git.

- Open the code editor.

Click [Edit](#) to open the config.yaml file in the code editor.

- Delete the job.

Click [Delete](#) to remove the job from the SAP Continuous Integration and Delivery service and the configuration file is deleted from the repository. This affects all users working in the repository.

From the [CI/CD JOBS](#) view menu bar, you can click  (Settings) to open the Settings page, or [+](#) to add a new job.

Develop an App Using Different Subaccounts

You can develop your application with different subaccounts. You use one subaccount to create and run your application in SAP Business Application Studio. You use the other subaccount, in a different region, to deploy your application to Cloud Foundry.

This scenario is useful in the following situations:

- You're using a single development subaccount to develop many target accounts.
- Your development account isn't in the same region as your target account.

Develop an app with two subaccounts as follows:

1. From your global account in the SAP BTP cockpit, create two subaccounts in two different regions. See [Create a Subaccount \[Feature Set B\]](#).

One subaccount is for the design time environment and the other is for the runtime environment.

2. Complete the following steps in the design time subaccount:

- a. Add the relevant SAP Business Application Studio service plan. See [Configure Entitlements and Quotas from Your Subaccount](#).

- b. [Subscribe to SAP Business Application Studio](#).

3. Navigate to the [Overview](#) page of your runtime subaccount and click [Enable Cloud Foundry](#). This enables you to deploy the application to Cloud Foundry. See [Create Orgs](#).

4. If you're using an external data source (outside SAP BTP) for your application, create the same destination, with the same name, in **both** subaccounts. See [Create HTTP Destinations](#) and [Add a System](#).

5. [Log in to Cloud Foundry](#). Make sure to update the Cloud Foundry endpoint with the region of the runtime subaccount (for example, change `https://api.cf.us10.hana.ondemand.com` to `https://api.cf.eu10.hana.ondemand.com`).

6. [Create a Project](#) in the design time subaccount. Make sure to connect to the relevant destination during data source and service selection.

7. Test your application by [creating a run configuration](#). Make sure to bind the relevant destination.
8. [Build and deploy](#) your application.

Your application uses the runtime subaccount to deploy to Cloud Foundry.

Extend SAPUI5 Applications

You can extend SAPUI5 applications that reside remotely on the on-premise SAPUI5 ABAP repository.

Prerequisites

- Activate the /sap/bc/adt and the /sap/bc/ui2/app_index/ services in your back end.
- Make sure you have configured the connectivity to your ABAP system as described in [Connecting to External Systems](#).

Procedure

1. Migrate your extension project from SAP Web IDE.

See [Migrate an Extension Project from SAP Web IDE](#).

2. (Optional) Use source control, such as Git, to maintain your extension project source code.

You must use the extension project source code to preview the extension project and add more extensions to it.

See [Git Source Control](#).

3. Add an extension, such as a view or controller extension, to the extension project. See [Create New Extensions](#).

4. Preview your extension project locally in the SAP Business Application Studio workspace.

See [Preview an Application](#).

5. Deploy your extension project to the on-premise SAPUI5 ABAP repository.

See [Deployment to ABAP](#).

i Note

When extending a project, compatibility issues may arise between the original and the extended project. For more information, see [Caveats Regarding Stability Across Application Upgrades](#).

i Note

The SAPUI5 ABAP repository is based on the BSP repository of the ABAP Server. The BSP repository is used only as a repository or storage for SAPUI5 application files. However, BSP server-side processing is not used at runtime and therefore the flow logic of ABAP parts cannot be used, since they are not executed at runtime.

Migrate an Extension Project from SAP Web IDE

To add new extensions to your extension project, you need to first migrate it from SAP Web IDE.

Prerequisite

Copy the destination from the SAP Web IDE subaccount to the SAP Business Application Studio subaccount:

- Find the name of the destination to be copied from the extension project's neo-app.json file.

- Export the destination from the Neo subaccount.

See [Exporting Solutions](#).

- Go to the SAP Business Application Studio subaccount and import the destination.

See [Import Destinations](#).

- Add the following new property:

| Property | Value |
|--------------------------|-------|
| HTML5.DynamicDestination | true |

- Make sure that the following properties were added:

| Property | Value |
|---------------|----------------------|
| WebIDEEnabled | true |
| WebIDEUsage | odata_abap, dev_abap |

See [Connecting to External Systems](#).

- Configure the Cloud Connector to your system.

See [Cloud Connector](#).

Procedure

- Clone your extension project to SAP Business Application Studio from your Git repository or import the project that you exported from the SAP Web IDE workspace.

- Make sure that all the resources created in SAP Web IDE are included in this project, including the .che folder and the neo-app.json file.

- In the popup window that appears, click **Start Migration**.

The **Migration** view opens.

i Note

You can also open the **Migration** view by entering **Fiori: Migrate Project for use in Fiori tools** in the command palette.

- In the **Migration** view, perform the following steps:

- Select the destination associated with your original application system (the destination from the [Prerequisite](#) section).

- Select an SAPUI5 version.

Currently, the minimum version required is 1.71.0.

- Start the migration.

See [Migration steps](#) for more information.

- Verify that the .extconfig.json configuration file was created under the extension project's root folder, which is required for further development of this extension project in SAP Business Application Studio.

Development Actions after Migration

You can add extensions, preview, and deploy. See [Extend SAPUI5 Applications](#) for more information.

Create New Extensions

Extensions enable you to change the views or the logic of an extended project.

Prerequisites

You migrated an extension project.

Context

You can create extensions to:

- Replace an existing view with a new view in an existing project.
- Add logic to an existing view using an extension point that is defined in the original project.
- Change control visibility.
- Extend an existing controller with new logic.
- Implement a UI controller hook with new logic.
- Customize the strings of the original application.

Once the extensions have been created, a reference to them is created in the `Component.js/manifest.json` file of the extended project.

i Note

If you delete or rename a file that is referenced from the `component.js/manifest.json` file, the application does not work properly. Make sure that you delete the reference or update the file name on the `component.js/manifest.json` file as well.

[Extend Controllers](#)

You can extend a controller of the original application by replacing it with an empty controller or with a copy of the original controller. You can also implement UI controller hooks if they are provided by the original application. Once one of these controllers is in place, you can customize it as needed.

[Extend Views](#)

You can extend a view using an extension point.

[Hide Controls](#)

You can hide a specific control of the original application.

[Edit Strings](#)

The i18n Resource Text Customization extension allows you to copy the `i18n` folder of the original application to your extended application. This allows you to edit the UI strings in the extended application without altering the original application.

[Replace Views](#)

You can replace a specific view in an original application with a new view.

Extend Controllers

You can extend a controller of the original application by replacing it with an empty controller or with a copy of the original controller. You can also implement UI controller hooks if they are provided by the original application. Once one of these controllers is in place, you can customize it as needed.

Replacing Controllers

Procedure

1. In the [File Explorer](#), navigate to the extension project to which you want to add the extension.
2. Right-click the `.extconfig.json` file and click [Create Extension](#).
3. Make sure that the desired extension project is selected and click [Next](#).
4. Select [Extend Controller](#) and then click [Next](#).
5. Select the controller that you want to extend.
6. From the [Replace with](#) dropdown list, select [Copy of the original controller](#) to edit the controller based on the original controller, or select [Empty Controller](#) to replace the controller with an entirely new one and click [Next](#).
7. Click [Finish](#) to add the extension to the selected extension project.

i Note

The new controller extends the controller that is provided by SAP. Methods of the custom controller override standard methods with the same name (except for the controller lifecycle methods that are called in addition to the original controller method implementations). When overriding a controller method, any functionality that was previously provided by the SAP controller in this method is no longer available. Likewise, any future changes made to the SAP controller method implementation will not be reflected in the custom controller.

Implementing UI Controller Hooks

Procedure

1. In the [File Explorer](#), navigate to the extension project to which you want to add the extension.
2. Right-click the `.extconfig.json` file and click [Create Extension](#).
3. Make sure that the desired extension project is selected and click [Next](#).
4. Select [Implement UI Controller Hook](#) and click [Next](#).
5. Select the controller and the UI controller hook that you want to implement and click [Next](#).
6. Click [Finish](#) to add the extension to the selected extension project.

Extend Views

You can extend a view using an extension point.

Prerequisites

You must have defined extension points in the original application.

Procedure

1. In the [File Explorer](#), navigate to the extension project to which you want to add the extension.
2. Right-click the `.extconfig.json` file and click [Create Extension](#).
3. Make sure that the desired extension project is selected and click [Next](#).
4. Select [Extend View/Fragment](#) and click [Next](#).
5. Select the view or fragment that you want to extend.
6. Select the desired extension point.

i Note

Not all views or fragments have extension points.

7. Click [Next](#).
8. Click [Finish](#) to add the extension to the selected extension project.

Hide Controls

You can hide a specific control of the original application.

Context

Controls that are configured in a fragment that is loaded dynamically might still appear in the UI. Elements that are set as [visible](#) manually by the view's controller will not be hidden.

You can try and hide these controls by replacing the view or extending the controller that hides it and override the method.

Procedure

1. In the [File Explorer](#), navigate to the extension project to which you want to add the extension.
2. Right-click the `.extconfig.json` file and click [Create Extension](#).
3. Make sure that the desired extension project is selected and click [Next](#).
4. Select [Hide Control](#) and click [Next](#).
5. Select the view or fragment containing the control that you want to hide.
6. Select the specific control that you want to hide.

i Note

Only controls with an ID that is defined in the original application appear in the list.

7. Click [Next](#).
8. Click [Finish](#) to add the extension to the selected extension project.

i Note

You can only hide controls that have their `Visible` property defined as `true`. If the `Visible` property does not exist, you cannot hide the control.

i Note

If you hide a control and then want to show it again, you must delete the extension from the `component.js/manifest.json` customizing block. Changing the `visible` property from `False` to `True` does not make the control reappear.

Edit Strings

The i18n Resource Text Customization extension allows you to copy the `i18n` folder of the original application to your extended application. This allows you to edit the UI strings in the extended application without altering the original application.

Prerequisites

The original application must have an `i18n` folder with at least one `Properties` file that contains the relevant strings.

Procedure

1. In the [File Explorer](#), navigate to the extension project to which you want to add the extension.
2. Right-click the `.extconfig.json` file and click [Create Extension](#).
3. Make sure that the desired extension project is selected and click [Next](#).
4. Select the [i18n Resource Text Customization](#) tile and click [Next](#).
5. Click [Finish](#) to confirm and add the extension.

Results

The `i18n` folder of the original application is copied to your extended application, including all its `.properties` files. You can change one or more of the strings in the `.properties` file and run your extended application to see them in runtime. The original application remains unchanged.

Replace Views

You can replace a specific view in an original application with a new view.

Context

- The new view can be edited using the layout editor.
- The new view replaces the view provided by SAP. Any future changes made to the SAP view will not be reflected in the new view. Furthermore, if the new view is an empty view, any functionality that was previously provided by the SAP view will not be available.

Procedure

1. In the [File Explorer](#), navigate to the extension project to which you want to add the extension.
2. Right-click the `.extconfig.json` file and click [Create Extension](#).
3. Make sure that the desired extension project is selected and click [Next](#).
4. Select [Replace View](#) and click [Next](#).
5. Select the view that you want to replace.
6. From the [Replace with](#) dropdown list, select [Copy of the original view](#) to edit the view based on the original view, or select [Empty View](#) to replace the view with an entirely new one.
7. Click [Next](#).
8. Click [Finish](#) to add the extension to the selected extension project.

Working with a Trial Account

Get a trial account to experience SAP Business Application Studio for free.

Trial accounts are intended for personal exploration, and not for production use or team development. They allow restricted use of the services. To learn more about the difference between enterprise and trial accounts, see [Enterprise versus Trial Accounts](#).

i Note

SAP Business Application Studio is available on Trial in the Singapore, Frankfurt, and US East (VA) regions.

If you do not have a subaccount in these regions, you need to create a new subaccount with the following settings:

| Provider | Supported Regions |
|---------------------------|---|
| Amazon Web Services (AWS) | Europe (Frankfurt) or US East (VA)
i Note
There is no support for new trial accounts in the Europe (Frankfurt) region. Trial accounts created before October 2021 will still be supported. |
| Microsoft Azure | Singapore |

[Getting Started with a Trial Account](#)

Set up your trial system to develop applications using SAP Business Application Studio.

[Trial Account Restrictions](#)

[Creating a New Subaccount](#)

Your trial account comes with a default subaccount that contains all the relevant roles and authorizations. You can create additional subaccounts, if needed.

Getting Started with a Trial Account

Set up your trial system to develop applications using SAP Business Application Studio.

1. Sign up for an SAP BTP trial account. See [Get a Free Trial Account](#).

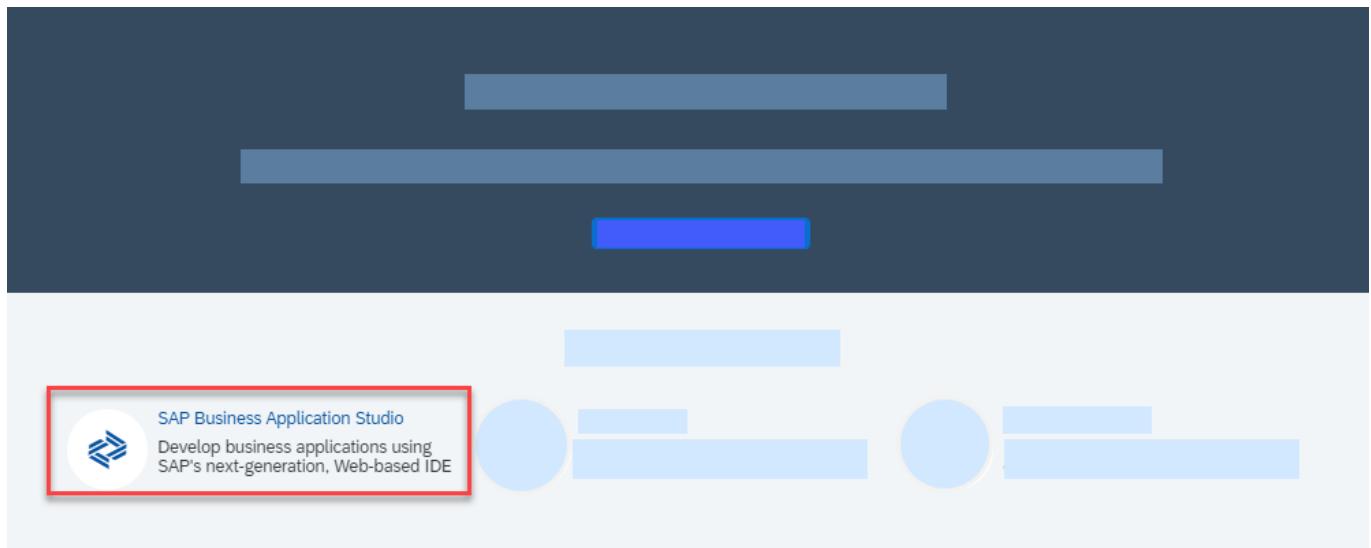
i Note

An SAP BTP trial account is free of charge. However, every trial user gets one trial account only.

Your trial account contains a subaccount called **trial** that is automatically created and already subscribed to SAP Business Application Studio.

Any other subaccount that you create requires a manual subscription. See [Creating a New Subaccount](#).

2. Open the SAP BTP trial cockpit.
3. From the **Quick Tool Access** section, click **SAP Business Application Studio**.



SAP Business Application Studio opens.

4. Click **Create Dev Space** to begin working.

Trial Account Restrictions

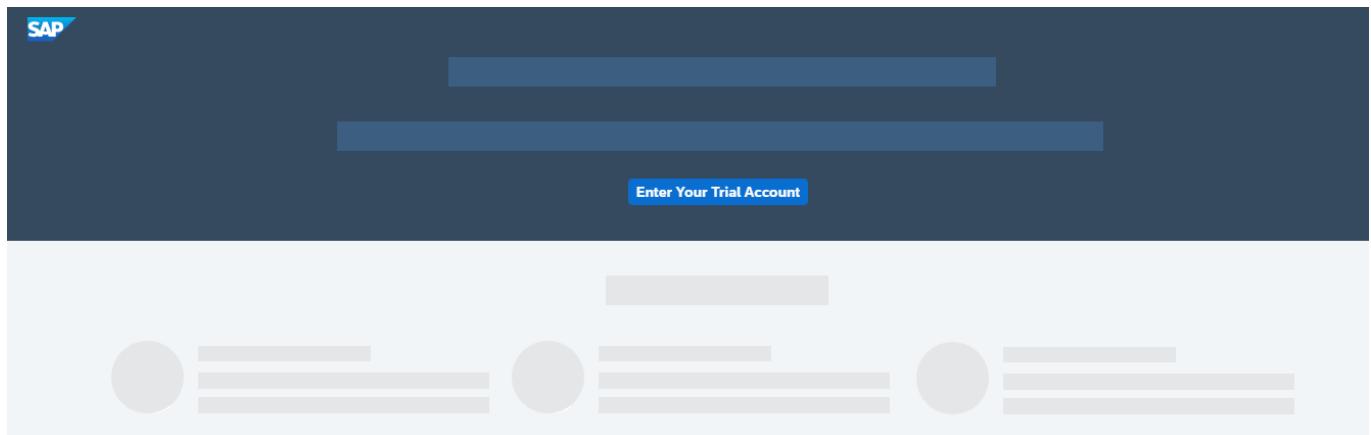
In addition to the regular SAP Business Application Studio [restrictions](#), when using a trial account the following restrictions also apply:

- A user can only have up to 2 dev spaces.
- A user can only have 1 dev space in the RUNNING state at a time.
- The session times out after one hour of inactivity.
- The maximum size limit of a dev space is 4 GB.
- Dev spaces that have not been in the RUNNING state for 30 consecutive days will be deleted.

Creating a New Subaccount

Your trial account comes with a default subaccount that contains all the relevant roles and authorizations. You can create additional subaccounts, if needed.

1. From the SAP BTP cockpit, click **Enter your Trial Account**.



2. Click **New Subaccount**.

3. Fill in the required fields and click **Create**.

4. Open your new subaccount.

5. From the navigation area, click **Entitlements**.

The screenshot shows the SAP Fiori interface with a dark blue header. In the top right corner, there is a breadcrumb trail: 'NewSubaccount'. Below the header, on the left, is a navigation tree with several collapsed categories. On the right, under the heading 'Subaccount:', there is a list of entitlements. At the top right of this list, there is a button with a checkmark icon and the text '0 (0 available)'. The 'Entitlements' button in the navigation bar is highlighted with a red box.

6. Click **Configure Entitlements**.

7. Click **Add Service Plans**.

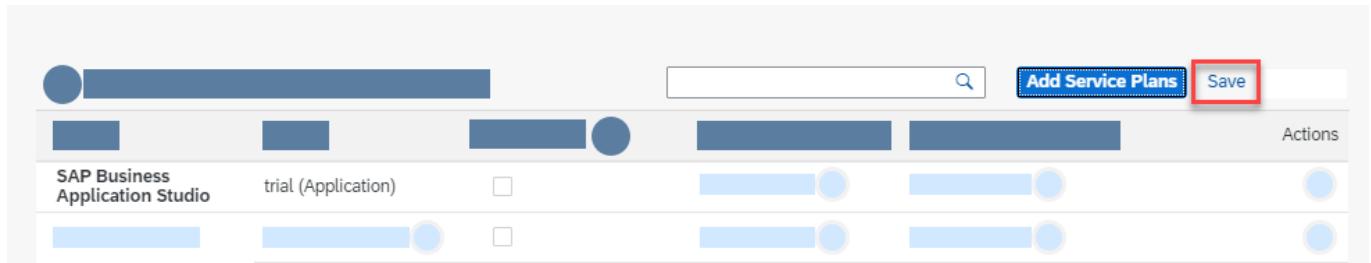
8. Search for **Studio**.

9. Select SAP Business Application Studio and, under **Available Plans**, select **trial (Application)**.

10. Click **Add 1 Service Plan**.

The screenshot shows the 'Entitlements' screen with a search bar containing 'Studio', which is highlighted with a red box. Below the search bar, there is a list of entitlements: 'SAP Business Application Studio'. On the right side, there is a panel titled 'Service Details: SAP Business Application Studio' with a section for 'Available Plans'. Under 'Available Plans', the 'trial (Application)' plan is selected, indicated by a checked checkbox, and is also highlighted with a red box. At the bottom of the screen, there is a message '1 selected plan' and 'Services: SAP Business Application Studio (1 plan)'. At the very bottom right, there is a red-bordered button labeled 'Add 1 Service Plan'.

11. Click **Save**.



12. From the navigation area, click **Service Marketplace**.
13. Search for Studio.
14. Select SAP Business Application Studio and click **Create**.
15. From the **New Instance or Subscription** dialog box, leave the default selections and click **Create**.
16. Click **View Subscription** to see the details of your new subaccount.
17. Click **Go to Application**.

Restrictions

SAP Business Application Studio computing resources (CPU, memory, storage) are limited and optimized for serving standard SAP application development use-cases.

To ensure an optimal performance and developer experience, the following restrictions must be maintained:

- A user can create up to 10 dev spaces.
- A user can only have up to two running dev spaces.
- A user can have disk space of up to 10 GB per dev space.
- A user can only have up to 100 projects stored on their dev space.
- A user can only have up to 20 projects or MTA modules open in their workspace.
- A user can only have up to 1000 Java classes on a single project compilation.
- A user can only have up to 1000 SAP HANA database artifacts on a single project compilation.

If your resource usage is close to any of the restrictions above, the system performance may be impacted.

If the restrictions are surpassed, performance can't be assured by the SAP Business Application Studio product license.

i Note

We recommend you connect to the data center that is closer to your physical location to ensure best performance. See [SAP Business Application Studio Availability](#).

Troubleshooting

You can find solutions for common troubleshooting issues in SAP Business Application Studio in our [Guided Answers](#).

You can also access the Guided Answers directly from SAP Business Application Studio by searching for **Guided Answers** in the command palette.

Contact SAP Support

We suggest you report an incident or error through the SAP Support Portal.

1. Create a new incident. See [Getting Support](#).

Select the relevant component from the list below:

| Component | Description |
|-----------|---|
| CA-BAS | SAP Business Application Studio issues. |

| Component | Description |
|------------------|--|
| CA-BAS | SAP Business Application Studio issues. |
| CA-BAS-BLD-HTML5 | HTML5 module build - SAP Business Application Studio |
| CA-BAS-BLD-MTA | Build MTA applications - SAP Business Application Studio |
| CA-BAS-DPL-ABAP | Deploy to ABAP - SAP Business Application Studio |
| CA-BAS-DPL-MTA | Deploy MTA applications - SAP Business Application Studio |
| CA-BAS-RUN-HTML5 | Run HTML5 Module - SAP Business Application Studio |
| CA-BAS-RUN-CFG | Run Configurations view - SAP Business Application Studio |
| CA-BAS-RUN-CAP | Run CAP application - SAP Business Application Studio |
| CA-BAS-TPL-FIORI | SAP Fiori project template - SAP Business Application Studio |
| CA-BAS-TPL-MTA | MTA templates - SAP Business Application Studio |
| CA-BAS-WS-MNG | Dev space Manager - SAP Business Application Studio |
| CA-BAS-WS-CTRL | Dev Space Controller - SAP Business Application Studio |
| CA-BAS-EDT-HTML5 | Fiori development (code assist, validations, i18n) - SAP Business Application Studio |
| CA-BAS-EDT-W5G | Layout Editor (WYSIWYG) - SAP Business Application Studio |
| CA-BAS-EDT-JAVA | JAVA tools - SAP Business Application Studio |
| CA-BAS-EDT-MTA | MTA descriptor (<code>mta.yaml</code>) editor |
| CA-BAS-CNSM | Consume SAP Services - SAP Business Application Studio |
| CA-BAS-BSC | Basic Tools (npm, GIT) - SAP Business Application Studio |
| CA-BAS-CF | Cloud Foundry Tools command palette - SAP Business Application Studio |
| CA-BAS-WIZ | Yeoman-UI generator - SAP Business Application Studio |
| CA-BAS-FLO | File system, logging, Operator Clusters - SAP Business Application Studio |
| CA-BAS-MON | Monitoring - SAP Business Application Studio |
| CA-BAS-AUT | Login, roles, authentication, authorizations - SAP Business Application Studio |
| CA-BAS-WEX | Extension management - SAP Business Application Studio |
| CA-BAS-HAN-DPL | HANA Explorer for SAP Business Application Studio |

i Note

Contact the Customer Interaction Center (CIC) in order to ask for a speed-up to your request. You will find additional information in SAP Note [560499](#).

We invite you to participate in the SAP Product Support Accreditation Program. This program will show you how you can work best with Product Support to get faster, easier closure to your incidents. For additional information see the SAP KBA [2911278](#).