Operation Deployment and Execution

Introduction

This page describes how to deploy operations or selected project components to the Jitterbit Harmony cloud. Once all components that an operation is dependent on are deployed, those operations can be executed. For convenience, dependent components are automatically deployed when manually executing an operation.

Deploying

There are three options for operation deployment: deploying directly, configuring a deploy, and deploying directly and running the operation:

- **Deploy:** This option refers to direct deployment of an operation and its dependent components. Selecting this option immediately deploys the operation and all components it is dependent on, or reports validation errors preventing deployment.
- **Deploy and Run:** This option is the same as the **Deploy** option, except that after a successful deploy the operation and any downstream operations will also be executed (see Executing later on this page).
- **Configurable Deploy:** This option refers to deployment of selected project components. Selecting this option opens a deployment configuration screen where you can choose which project components to deploy. The operation and project components that the operation is dependent on are selected by default.

With all three options, if there are any project variables or schedules being deployed that have already been deployed in the Harmony cloud, a screen will present you with options for selecting which values to use. This is covered later on this page under Selecting Schedules and Project Variables.

Deploy

The option to deploy an operation is accessible from the project pane and the design canvas:

- **Project Pane:** In the **Workflows** or **Components** tab of the project pane, hover over an operation name and click the actions menu icon ⚫⚫⚫ to open the actions menu. From the menu, select **Deploy**.
- **Design Canvas:** In the top right of an operation, hover over the actions menu icon ⚫⚫⚫ to open the actions menu. From the menu, select **Deploy**.

Upon selecting this option, a deploy will immediately be attempted for the operation and any components it is dependent on. In order for the deploy to succeed, all dependent components must be valid. If any dependent components are invalid, the specific validation error(s) will be provided in a popup message. For documentation on each error and how to resolve it, refer to Workflow Validity, Operation Validity, or Component Validity, respectively.

Deploy and Run

The option to deploy and run an operation is accessible from the project pane and the design canvas:

- **Project Pane:** In the **Workflows** or **Components** tab of the project pane, hover over an operation name and click the actions menu icon ⚫⚫⚫ to open the actions menu. From the menu, select **Deploy and Run**.
- **Design Canvas:** In the top right of an operation, hover over the actions menu icon ⚫⚫⚫ to open the actions menu. From the menu, select **Deploy and Run**.

Upon selecting this option, a deploy will immediately be attempted for the operation and any components it is dependent on. In order for the deploy to succeed, all dependent components must be valid. If any dependent components are invalid, the specific validation error(s) will be provided in a popup message. For documentation on each error and how to resolve it, refer to Workflow Validity, Operation Validity, or Component Validity, respectively.

If the deploy succeeds, the operation and any downstream operations will also be run. For details, see Executing later on this page.

Configurable Deploy

The option to configure a deploy for all project components, with the operation and its dependent components selected by default, is accessible from the project pane and the design canvas:

- **Project Pane:** In the **Workflows** or **Components** tab of the project pane, hover over an operation name and click the actions menu icon ⚫⚫⚫ to open the actions menu. From the menu, select **Configurable Deploy**.

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- **Design Canvas:** In the top right of an operation, hover over the actions menu icon ••• to open the actions menu. From the menu, select **Configurable Deploy**.

Upon selecting this option, a deployment configuration screen opens where you can choose which project components to deploy:
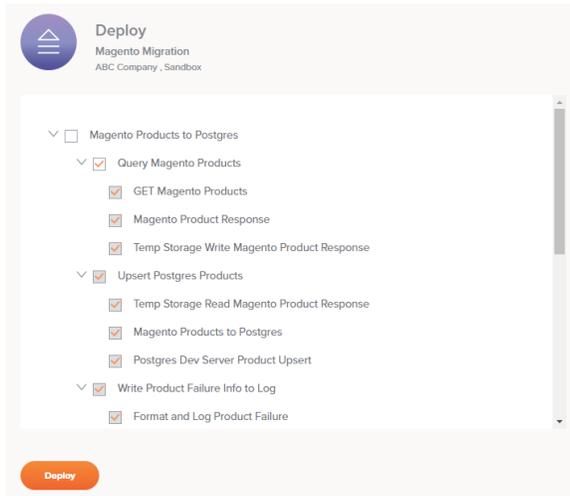
The operation and its dependent components will be selected by default. Clear the checkbox selections as desired to deploy only selected project components. Components that are dependencies of other selected components cannot have their selections cleared, as failure to deploy these items would cause the component that has the dependency to become invalid.

To collapse or expand workflows, operations, and operation steps, use the disclosure triangles ∨ ⟩ displayed to the left of the component name.

The names of invalid components appear in the color red and italics. In addition, the names of components that are not used directly in a workflow are preceded by a tilde ~, as demonstrated with this schedule:

When all the desired project components you want to be deployed are selected, click the **Deploy** button.

If any selected components are invalid, the specific validation error(s) will be provided in a popup message. For documentation on each error and how to resolve it, refer to Workflow Validity, Operation Validity, or Component Validity, respectively.

Executing

Once all components that an operation is dependent on are deployed, those operations can be executed. For convenience, dependent components are automatically deployed when manually executing an operation. When you run an operation, any downstream (linked) operations are also executed.

As described below, you can execute operations manually at design time, using a script (in either Cloud Studio or Design Studio), from a command line on an agent, using an API trigger, or using a schedule. Once operations are executed, you can validate proper behavior by checking operation logs.

Manually

Manual execution of an operation is commonly used during project development to test select operations or the entire project. This can be done in Cloud Studio as described below, or can be accomplished from the Projects page of the Management Console for operations that have already been deployed.

Almost all operations can be executed manually. The exception is operations that are triggered through the Harmony API Manager if they use an API or API SOAP request activity that provides source data to the operation. These operations cannot be run manually because they require data to be provided by an API that is exposed through the API Manager.

Since an operation cannot be run unless it has first been deployed, execution is coupled with deployment using the **Deploy and Run** option that is accessible from the project pane and the design canvas:

- **Project Pane:** In the **Workflows** or **Components** tab of the project pane, hover over an operation name and click the actions menu icon ••• to open the actions menu. From the menu, select **Deploy and Run**.

- **Design Canvas:** In the top right of an operation, hover over the actions menu icon ••• to open the actions menu. From the menu, select **Deploy and Run**.

Upon selecting this option, a deploy will immediately be attempted for the operation and any components it is dependent on. The deploy must succeed for the operation to be run, as described earlier on this page under Deploying.

If the deploy succeeds, the operation and any downstream operations linked with operation actions will also be kicked off based on the configured conditions.

If the operation has been successfully submitted to the operation queue, the real-time operation status is reported in the lower left of an operation:
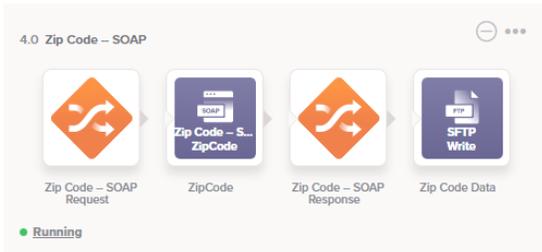
The operation status is displayed for all operations that are run within an operation chain.

The reported status corresponds with the statuses described on the Operation Logs page under Filter by Status. Click the operation status to view detailed log information. The operation log screen automatically opens in a separate tab so that you can continue working while operations are running (see Operation Logs).

Once you have manually run the operation, the operation status is displayed indefinitely and is not affected by additional deploys or by running the operation in another way. Only by manually re-running the operation will the operation status be refreshed. Hover over the operation status to view the last time the status was refreshed (reported in local browser time):
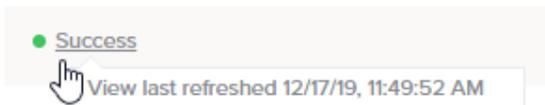
The text formatting style of the operation status is bold if an operation is running, or normal text if the operation is complete or at rest.

The color of the icon to the left of the reported status indicates the category of operation status:

Icon	Color	State
●	Green	The operation is currently running or has completed with a successful status.
●	Red	The operation has completed with an error status.
●	Gray	The operation is currently pending, has been canceled, or is inactive in some way.

> ⓘ **NOTE:** When operations are in the collapsed view, only the colored icons indicating the category of operation status are displayed.

Using a Script

To run an operation from a script, call the `RunOperation()` function in a script, as described in the function documentation.

To call another operation in the same project, simply drag it into the script. The complete function will automatically be created:

```
RunOperation("<TAG>operation:Operation 2</TAG>");
```

To call an operation in another project, obtain the GUID of the operation by running a simple script in that operation (using script testing) that uses the operation reference path to output the operation's GUID:

```
<trans>"<TAG>operation:Example Operation</TAG>";</trans>
```

(Once you have the GUID of an operation, the script can be removed.) The result from the script testing will be similar to `op.52c3eaa8-bc45-491f-b77f-cfeff994cf31`.

You can then use it with the `RunOperation()` function in the form `op.<GUID>` where `<GUID>` is the GUID of the other project's operation:

```
RunOperation("op.52c3eaa8-bc45-491f-b77f-cfeff994cf31");
```

To call a Design Studio operation from Cloud Studio, pass the `operationId` parameter to the function in the form `op.<GUID>` where `<GUID>` is the GUID of the Design Studio operation. This can be obtained from within Design Studio as shown in Calling an Operation from a Command Line, such as:

```
RunOperation("op.52c3eaa8-bc45-491f-b77f-cfeff994cf31");
```

To call a Cloud Studio operation from Design Studio, you will need the names of the project and operation. Cloud Studio operations, once their projects are deployed, are available to be called by Design Studio projects by project and operation name. See the Design Studio `RunOperationFromProject()` function:

```
RunOperationFromProject("<TAG>Projects/MyCloudStudioProject/Operations
/MyCloudStudioOperation</TAG>");
```

Using a Command Line from an Agent

Operations can also be called from a command line on an agent in the environment where the project is deployed. See Calling an Operation from a Command Line for details.

Using an API Trigger

To call the operation from an external application, use the API Manager to configure a Jitterbit Custom API and assign the operation to trigger on request. For more information, refer to API Manager documentation.

Using a Schedule

To run the operation automatically on a schedule, you must first configure a schedule and then apply it to an operation. Schedules can be created and applied directly in Cloud Studio as described below, or they can be created and applied from the Projects page in the Management Console.

> ⓘ **NOTE:** After a schedule has been applied to an operation, it can also be disabled or re-enabled from the Projects page in the Management Console. This functionality is available only in the Management Console (not in Cloud Studio).

Schedules are added from the **Schedules** tab of the operation settings, which is accessible from the project pane and the design canvas:

- **Project Pane:** In the **Workflows** or **Components** tab of the project pane, hover over an operation name and click the actions menu icon ••• to open the actions menu. From the menu, select **Settings**.
- **Design Canvas:** In the top right of an operation, hover over the actions menu icon ••• to open the actions menu. From the menu, select **Settings**.

Upon selecting this option, the operation settings screen opens on the **Schedules** tab. For detailed configuration information, see Operation Schedules. To create a schedule, first use the link to **Create New Schedule**. Once a schedule is created, select it from the **Schedule** dropdown and click **Assign** to apply it to an operation.

To edit an existing schedule that is already assigned to an operation, click the schedule icon 🗓 in the top right of the operation to display the **Schedules** tab of the settings, where you can edit or delete the schedule.

Selecting Schedules and Project Variables

If there are any project variables or schedules being deployed that have already been deployed in the Harmony cloud, a screen will present you with options for selecting which values to use. This allows you to keep or override values set outside of Cloud Studio, such as through the Management Console Projects page.
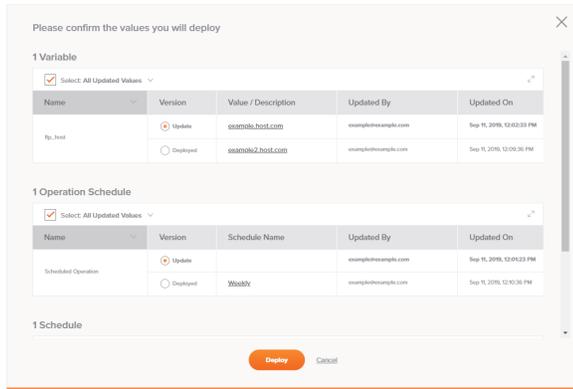
Each category, of variables, operation schedules, and schedules, is covered below. Once you have made your selections, click **Deploy** to continue with the deploy or configurable deploy as configured, or **Cancel** to return to the design canvas without deploying.

Variables

This table includes any project variables that have a different value or description from those already deployed in the Harmony cloud:

- **Select:** When selected, this checkbox is used to toggle the selections in the **Version** column. When cleared, the option selected in the dropdown has no effect on the table. These dropdown options are available:
    - **All Updated Values:** When the checkbox and this option are selected, all selections in the **Version** column are toggled to **Update**.
    - **All Deployed Values:** When the checkbox and this option are selected, all selections in the **Version** column are toggled to **Deployed**.
- **Popout:** Click the popout icon to show only the table of variables, hiding any operation schedules and schedules. Once within this view, click the return icon to come back to the full screen.
- **Name:** The names of any project variables that have a different value or description from those already deployed in the Harmony cloud are listed.

    This *doesn't include* project variables that are already deployed but have the same value and description as that in the Cloud Studio project, or project variables that are only within the Cloud Studio project and haven't yet been deployed.

    > ✅ **TIP:** A project variable may have already been deployed in the Harmony cloud if you previously deployed the project or if you edited the project variable through the Management Console Projects page.

- **Version:** Select between the two versions of the project variable:
    - **Update:** Use the value and description of the project variable that is present in the Cloud Studio project. This will override the value and description currently deployed in the Harmony cloud. Once deployed, the project variable value and description in Cloud Studio and in the Harmony cloud will be in sync.
    - **Deployed:** Use the value and description of the project variable that is currently deployed in the Harmony cloud.

> ⚠ **WARNING:** Once deployed, the project variable value and description in Cloud Studio will not be updated. To continue using the version deployed in the Harmony cloud, you will need to make this selection each time you deploy the Cloud Studio project, or you can update the project variable in Cloud Studio to match that deployed in the Harmony cloud to prevent it from appearing on this screen.

- **Value / Description:** The value of the project variable is listed. If the value is configured to be hidden in the UI, asterisks that mask the value are displayed. Additional details can be viewed by hovering over the cell:
    - **Value:** The value of the project variable is listed. If the value is configured to be hidden in the UI, asterisks that mask the value are displayed.
    - **Description:** The description of the project variable is listed.
- **Updated By:** The Jitterbit Harmony username of the user who last updated the project variable component is listed. The update may have been made in Cloud Studio or the Management Console.
- **Updated On:** The date and time that the project variable component was last updated, reported in your local browser time zone.

Operation Schedules

This table includes any operations that have a difference in applied schedules compared with those already deployed in the Harmony cloud:

- **Select:** When selected, this checkbox is used to toggle the selections in the **Version** column. When cleared, the option selected in the dropdown has no effect on the table. These dropdown options are available:
    - **All Updated Values:** When the checkbox and this option are selected, all selections in the **Version** column are toggled to **Update**.
    - **All Deployed Values:** When the checkbox and this option are selected, all selections in the **Version** column are toggled to **Deployed**.
- **Popout:** Click the popout icon ⤢ to show only the table of operation schedules, hiding any variables and schedules. Once within this view, click the return icon ⤡ to come back to the full screen.
- **Name:** The names of any operations that have a difference in applied schedules compared with those already deployed in the Harmony cloud are listed.

    This *doesn't include* operations that have applied schedules that are already deployed but are the same in the Cloud Studio project, or applied schedules that are only within the Cloud Studio project and haven't yet been deployed.

    This *doesn't consider* whether the schedule has been enabled or disabled from the Management Console, as that isn't a setting that can be toggled in Cloud Studio.

    > ✅ **TIP:** A schedule applied on an operation may have already been deployed in the Harmony cloud if you previously deployed the project or if you applied or removed a schedule from an operation through the Management Console Projects page.

- **Version:** Select between the two versions of the operation that has schedule applied:
    - **Update:** Use the schedule that is applied on the operation in the Cloud Studio project. This will override the applied schedule setting currently deployed in the Harmony cloud. Once deployed, the applied schedule in Cloud Studio and in the Harmony cloud will be in sync.
    - **Deployed:** Use the schedule that is applied on the operation that is currently deployed in the Harmony cloud.

        > ⚠ **WARNING:** Once deployed, the operation to which the schedule is applied in Cloud Studio will not be updated. To continue using the version deployed in the Harmony cloud, you will need to make this selection each time you deploy the Cloud Studio project, or you can update the applied schedule in Cloud Studio to match that deployed in the Harmony cloud to prevent it from appearing on this screen.

- **Schedule Name:** The name of the schedule applied on the operation is listed. If the operation doesn't have an applied schedule, this cell will be empty. Additional details can be viewed by hovering over the cell:
    - **Name:** The name of the schedule applied on the operation.
    - **Occurs:** The days on which the schedule is configured to run.
    - **Frequency:** The times at which the schedule is configured to run. The time zone is that of the agent running the operation.
    - **Start Date:** The date on which the schedule is configured to start.
    - **End Date:** The date on which the schedule is configured to end.
- **Updated By:** The Jitterbit Harmony username of the user who last updated the applied schedule. The update may have been made in Cloud Studio or the Management Console.
- **Updated On:** The date and time that the applied schedule was last updated, reported in your local browser time zone.

Schedules

This table includes any operation schedules that have a different configuration from those already deployed in the Harmony cloud. Schedules in this category are listed regardless of whether they are applied on any operations:

- **Select:** When selected, this checkbox is used to toggle the selections in the **Version** column. When cleared, the option selected in the dropdown has no effect on the table. These dropdown options are available:
    - **All Updated Values:** When the checkbox and this option are selected, all selections in the **Version** column are toggled to **Update**.
    - **All Deployed Values:** When the checkbox and this option are selected, all selections in the **Version** column are toggled to **Deployed**.
- **Popout:** Click the popout icon to show only the table of schedules, hiding any variables and operation schedules. Once within this view, click the return icon to come back to the full screen.
- **Name:** The names of any schedules that have a different configuration from those already deployed in the Harmony cloud are listed. Schedules in this category are listed regardless of whether they are applied on any operations.

    This *doesn't include* schedules that are already deployed but have the same configuration in the Cloud Studio project, or schedules that are only within the Cloud Studio project and haven't yet been deployed.

    > ✓ **TIP:** A schedule may have already been deployed in the Harmony cloud if you previously deployed the project or if you created, edited, or deleted a schedule through the Management Console Projects page.

- **Version:** Select between the two versions of the schedule:
    - **Update:** Use the schedule configuration that is present in the Cloud Studio project. This will override the configuration currently deployed in the Harmony cloud. Once deployed, the schedule configuration in Cloud Studio and in the Harmony cloud will be in sync.
    - **Deployed:** Use the schedule configuration that is currently deployed in the Harmony cloud.

        > ⚠ **WARNING:** Once deployed, the schedule configuration in Cloud Studio will not be updated. To continue using the version deployed in the Harmony cloud, you will need to make this selection each time you deploy the Cloud Studio project, or you can update the schedule configuration in Cloud Studio to match that deployed in the Harmony cloud to prevent it from appearing on this screen.

- **Value:** A summary of the schedule configuration is listed. Additional details can be viewed by hovering over the cell:
    - **Name:** The name of the schedule.
    - **Occurs:** The days on which the schedule is configured to run.
    - **Frequency:** The times at which the schedule is configured to run. The time zone is that of the agent running the operation.
    - **Start Date:** The date on which the schedule is configured to start.
    - **End Date:** The date on which the schedule is configured to end.
- **Updated By:** The Jitterbit Harmony username of the user who last updated the schedule is listed. The update may have been made in Cloud Studio or the Management Console.

- **Updated On:** The date and time that the schedule was last updated, reported in your local browser time zone.