Universal Controller 6.7.x

Variables and Functions

Variables and Functions

The information on these pages also is located in the [UACDOC67:All Universal Automation Center PDFs^Universal Controller 6.7.x Variables and Functions.pdf].

Variables and Functions Overview

Variables and Functions

Variables and functions can be used in free-text fields within tasks and workflows. When a variable or function is specified in a free-text field, the Controller inserts its value into the field when the task or workflow is run.

Triggers can pass variables and functions into the tasks and workflows that they launch.

Additionally, email notifications for Controller resources (agents, OMS servers, and cluster nodes) can use Built-In Variables that are specific to that type of resource.

Types of Variables

Universal Controller supports the following types of variables, all of which can be used in free text fields within tasks:

User-Defined Variables	These variables are created by the user for use within: • A single trigger, task, or workflow (that is a trigger-, task-, or workflow-specific variable). • All trigger, tasks, and workflows (that is, a Global variable).
Built-In Variables	These variables, maintained by the Controller, allow you to access information about task instances and other related data, such as task name, task status, and trigger name.
Functions	These variables calculate some value, such as current date and time, or perform some function, such as _replaceAll.

Setting Variables under Special Circumstances

The Controller also supports several features that allow you to set variables under special circumstances:

- Manually launch tasks and temporarily set user-defined variables.
- Manually launch all of the tasks associated with a trigger while supplying variable values used by the task(s) (see Triggering with Variables).
- Use the Set Variable action to set variables within a task or workflow.
- Use the ops-variable-set CLI function to set variables.

User-Defined Variables

Overview

User-defined Universal Controller variables are available for use in triggers, tasks, and Workflows.

You can define variables to be either:

- Available to a single trigger, task, or workflow; that is, **Local**.
- Available to all triggers, tasks, and workflows; that is, Global.

You define **Local** variables (variables specific to a single trigger, task, or workflow) on the **Variables** tab in the Details of that trigger, task, or workflow. These variables are stored in the ***ops_local_variable*** table.

You define Global variables either by:

- Selecting **Other > Variables** from the Automation Center navigation pane.
- Using the Set Variable action for a task or workflow.

Global variables are stored in the ***ops_variable*** table.

Variable Naming Conventions

- Variable names must begin with a letter.
- Allowable characters are alphanumerics (upper or lower case), and underscore (_).
- White spaces are not permitted
- Variable names are not case-sensitive.

Warning
Do not define Controller variables with the prefix **ops**_. That prefix is reserved for built-in variables.

Resolving User-Defined Variables

When the Controller creates a task instance from a task, it also resolves all variables specified in its free text fields. Because you can define variables at four different levels (trigger, task, workflow, and global), the Controller follows a prescribed formula to determine which variable takes precedence if duplicate variables have been defined. The general order of precedence, each of which may or may not exist in any given situation, is as follows:

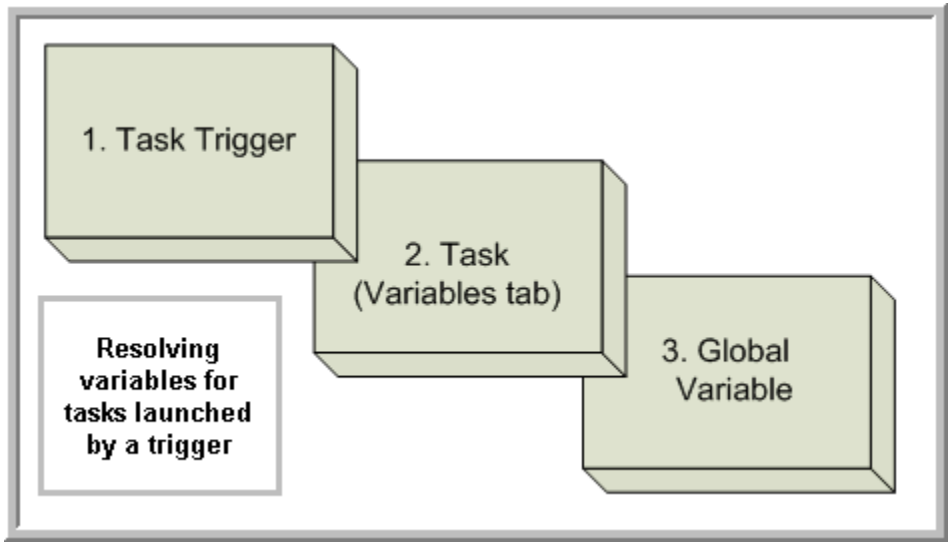
1. Task trigger (highest precedence)
2. Task
3. Workflow trigger
4. Workflow
5. Global (lowest precedence)

Note
You also can use the Set Variable Action of any task or workflow to define a variable. The Set Variable action explicitly states what scope you are setting the variable at, and under what circumstances.

The following scenarios provide more detailed information about how Controller variables are resolved.

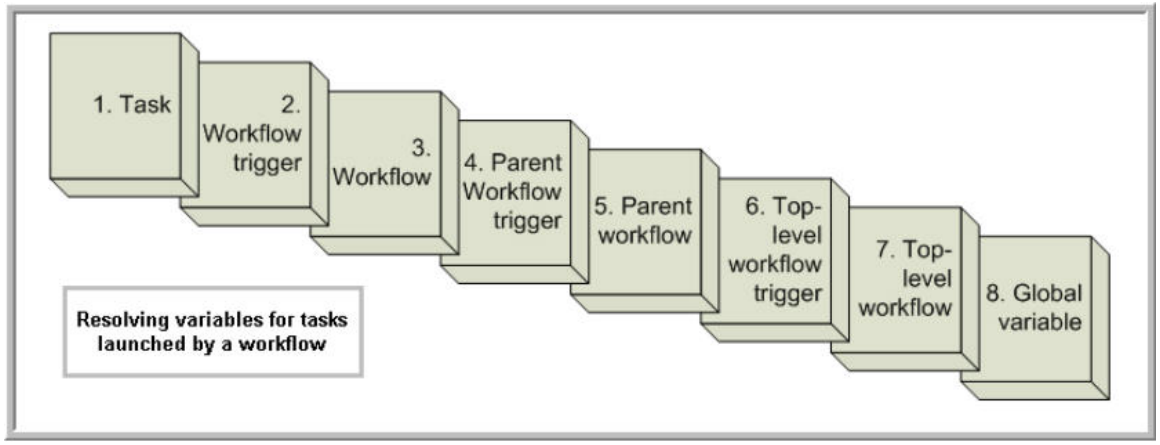
For Tasks Launched by a Trigger

1. If the trigger defines the variable in the variables tab, that value is used to resolve the variable.
2. If the trigger does not define the variable, the value from the variable tab in the task Details is used.
3. If neither the trigger nor the task define the variable, the variable definition in the global variables table is used.
4. If the global variables table does not define the variable, the variable remains unresolved.



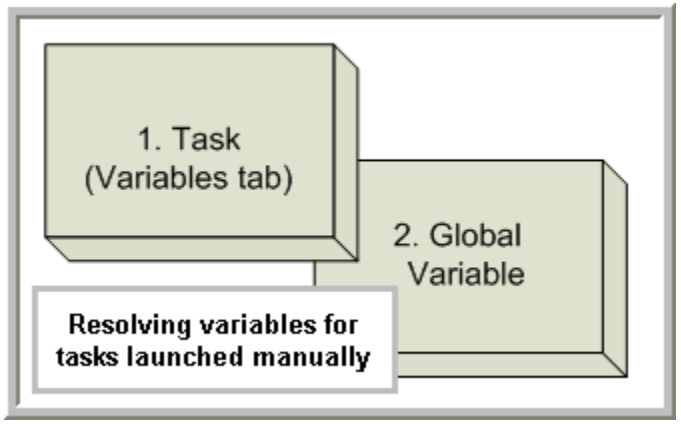
For Tasks Launched by a Workflow

1. If the task defines the variable in the variables tab, that value is used to resolve the variable.
2. If the task does not define the variable, and the workflow was launched by a trigger, the value defined in the trigger is used.
3. If the workflow's trigger does not define the variable or the workflow was not launched by a trigger, the value defined in the workflow is used.
4. If the workflow does not define the variable, and there is a parent workflow, the value defined in the parent workflow's trigger is used.
5. If the parent workflow's trigger does not define the variable or if there is no trigger, the value defined in the parent workflow is used.
6. If the parent workflow does not define the variable, the Controller checks up a level for the trigger on the next parent workflow.
7. If that trigger does not define the variable, it checks for variables associated with the workflow. (This continues until the top level workflow is reached.)
8. If the top-level workflow does not define the variable, the variable definition in the global variables table is used.
9. If the global variables table does not define the variable, the variable remains unresolved.



For Tasks Launched Manually

1. If the task defines the variable in the variables tab, that value is used to resolve the variable.
2. If the task does not define the variable, the variable definition in the global variables table is used.
3. If the global variables table does not define the variable, the variable remains unresolved.



Format for Using Variables

When you enter a variable into a text field, precede the variable with the dollar sign ($) and enclose the variable in curly braces ({ }). You can enter a series of variables or nested variables.

Examples:

```
${variable_name}
${v1}${v2}
${${inner_variable}}
```

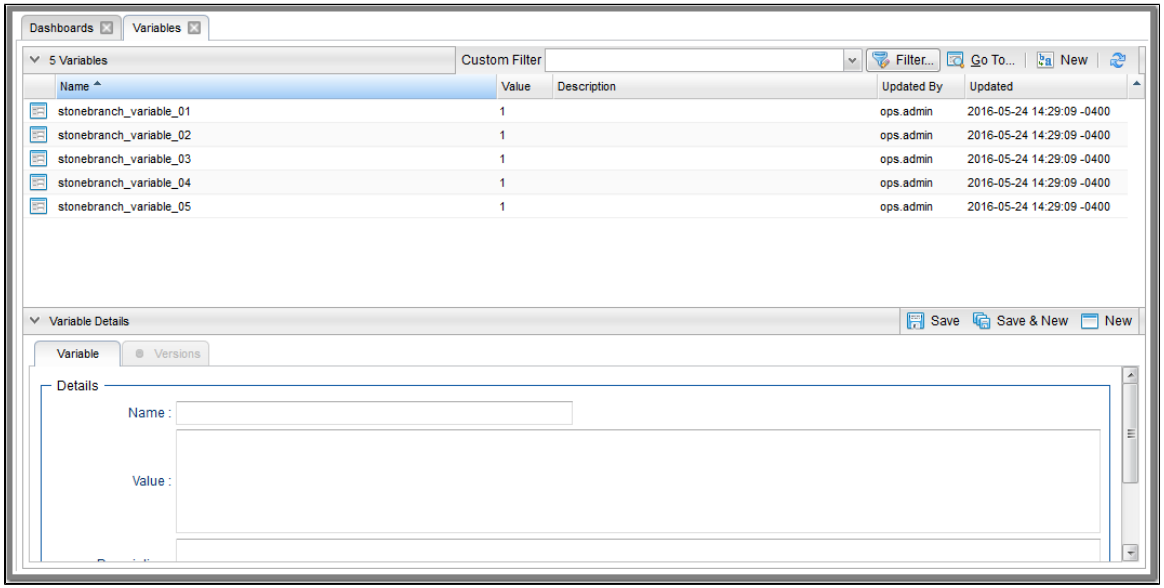
Creating a Variable

You can create variables that are:

1. Available on a Global level; that is, available for all triggers, tasks, and Workflows.
2. Available only for a specific trigger, task, or Workflow.

Creating a Global Variable

To create a Global variable that is available for all triggers, tasks, and Workflows:

Step 1	From the Automation Center navigation pane, select **Other > Variables**. The Variables list displays a list of all Global variables. (You also can define a Global variable by using the Set Variable action for a task or workflow.) Below the list, Variable Details for a new Global variable displays. 
Step 2	Enter / select Details for a new Variable, using the field descriptions below as a guide. • Required fields display in **boldface**. • Default values for fields, if available, display automatically. To display more of the Details fields on the screen, you can either: • Use the scroll bar. • Temporarily hide the list above the Details. • Click the **New** button above the list to display a pop-up version of the Details.
Step 3	Click a **Save** button to save the record in the Controller database.

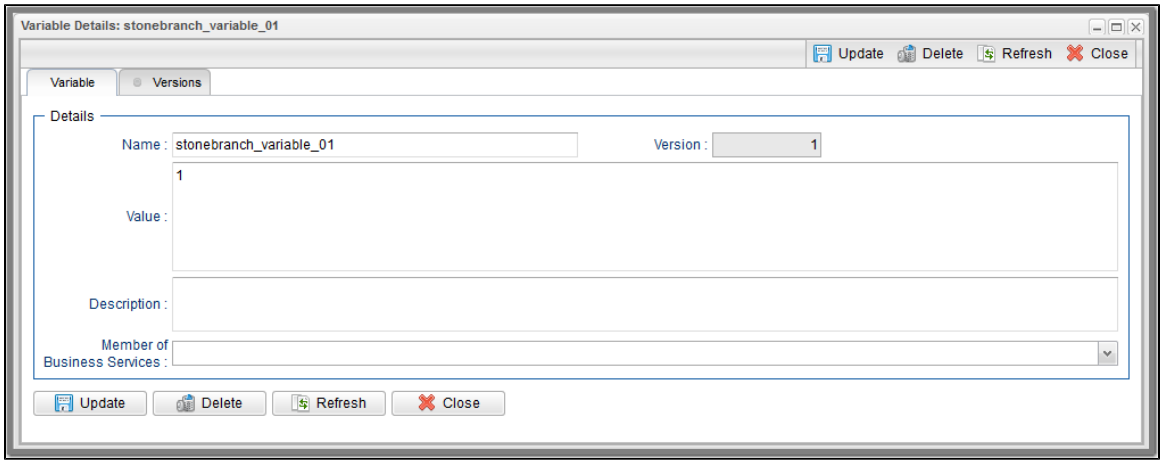
Note
To open an existing record on the list, either:

- Click a record in the list to display its record Details below the list. (To clear record Details below the list, click the **New** button that displays above and below the Details.)
- Clicking the Details icon next to a record name in the list, or right-click a record in the list and then click **Open** in the Action menu that displays, to display a pop-up version of the record Details.
- Right-click a record in the a list, or open a record and right-click in the record Details, and then click **Open In Tab** in the Action menu that displays, to display the record Details under a new tab on the record list page (see Record Details as Tabs).

Global Variable Details

The following Variable Details is for an existing Global Variable.

See the field descriptions below for a description of all fields that display in the Global Variable Details.



For information on how to access additional details - such as Metadata and complete database Details - for Variables (or any type of record), see Records.

Global Variable Details Field Descriptions

The following table describes the fields and buttons in the Variables Details.

Field Name	Description

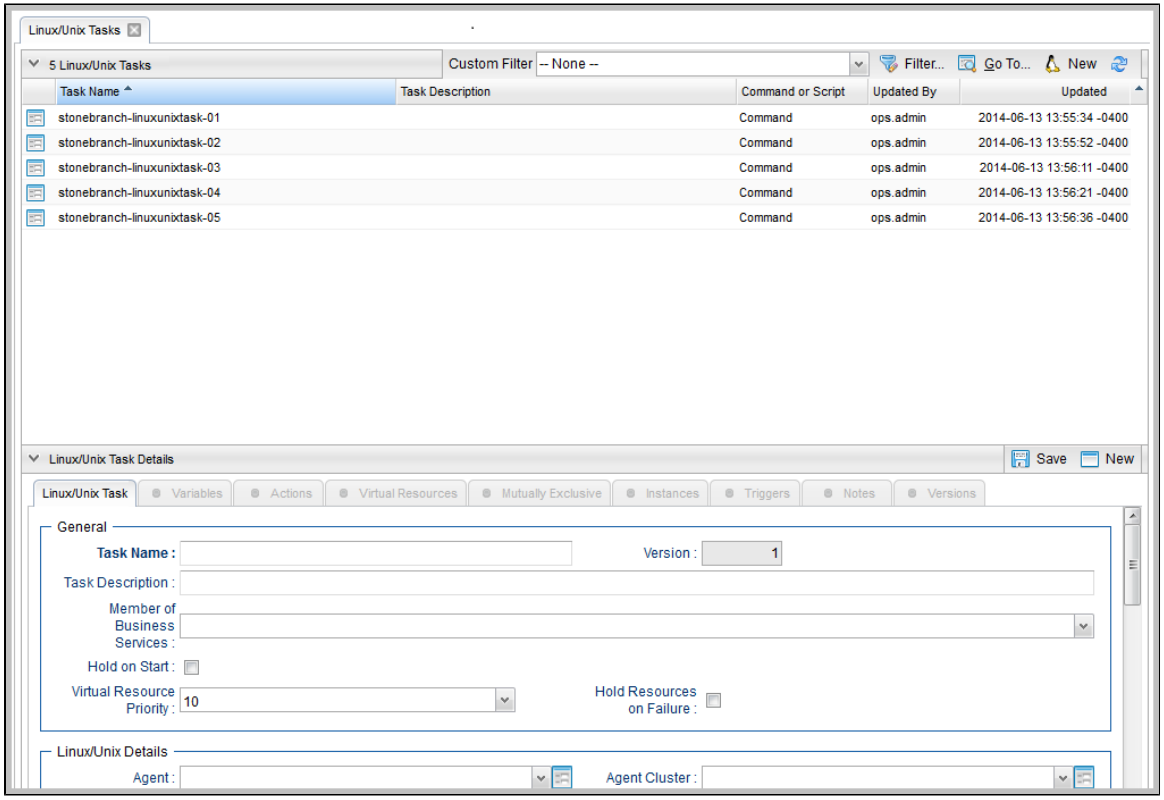
Name	Name of the variable. Up to 128 alphanumerics. The name must begin with an alphabetic character and can consist of: alphas (a-z, A-Z), numerics 0-9, _ (underscore). White spaces are not permitted; names are not case-sensitive. **Important** Do not define variables with the prefix **ops**_. The **ops**_ prefix is reserved for built-in variables.
Version	System-supplied. The version number of the current record, which is incremented by the Controller every time a user updates a record. Click the Versions tab to view previous versions. For details, see Record Versioning.
Value	Value of the variable up to a maximum of 4000 characters.
Description	Optional. Description of this variable.
Member of Business Services	User-defined; allows you to select one or more Business Services that this record belongs to. If the Business Service Visibility Restricted Universal Controller system property is set to true, depending on your assigned (or inherited) Permissions or Roles, Business Services available for selection may be restricted.
Metadata	This section contains Metadata information about this record.
UUID	Universally Unique Identifier of this record.
Updated By	Name of the user that last updated this record.
Updated	Date and time that this record was last updated.
Created By	Name of the user that created this record.
Created	Date and time that this record was created.
Buttons	This section identifies the buttons displayed above and below the Global Variable Details that let you perform various actions.
Save	Saves a new variable record in the Controller database.
Save & New	Saves a new record in the Controller database and redisplays empty Details so that you can create another new record.
Save & View	Saves a new record in the Controller database and continues to display that record.
New	Displays empty (except for default values) Details for creating a new record.
Update button	Saves updates to the record.

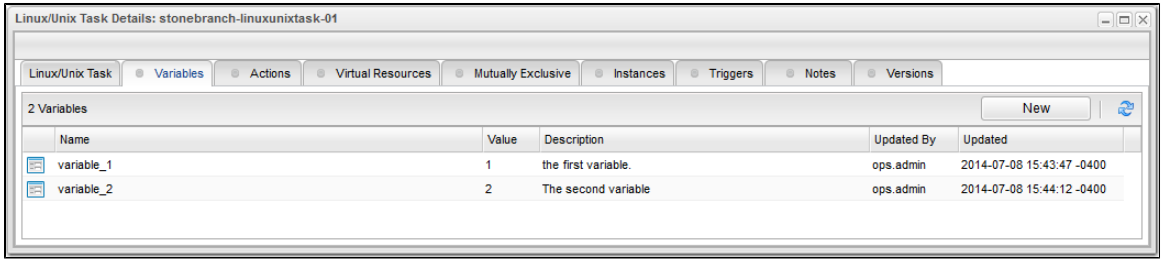
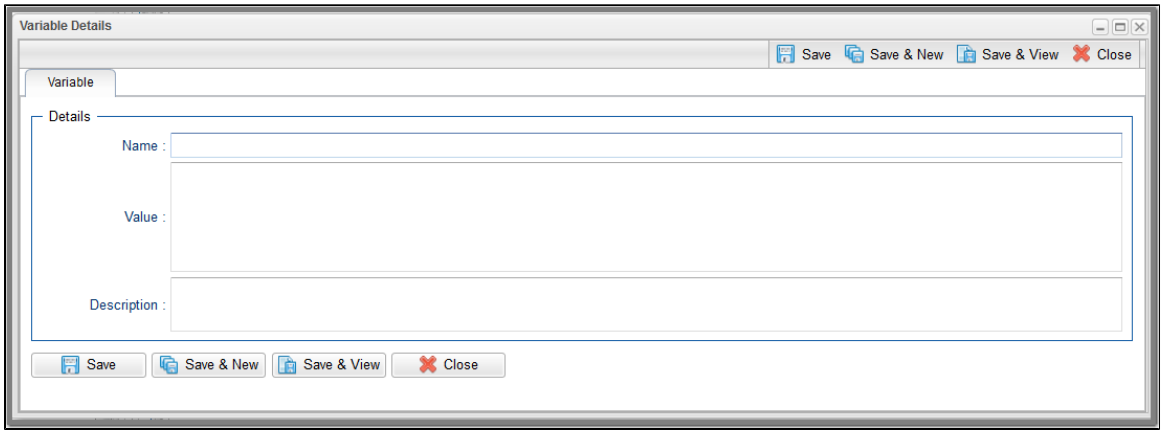
Delete button	Deletes the current record.
Refresh	Refreshes any dynamic data displayed in the Details.
Close	For pop-up view only; closes the pop-up view of this task.

Creating a Variable Specific to a Trigger, Task, or Workflow

To create a variable that is specific to a single trigger, task, or Workflow:

Step 1 From the Automation Center navigation pane, select **Trigger > <trigger type>** or **Tasks > <task type>**. The records list for that trigger or task type displays. For example:



Step 2	Open a task on the list and click the **Variables** tab to display a list of any currently defined variables specific to that record. 
Step 3	Click the **New** button to display Variables Details for a new variable. 
Step 4	Using the field descriptions provided for Global Variable Details as a guide, complete the fields as needed.
Step 5	Click the **Save** button, or right-click in the Details and click **Save**, to save the record.
Step 6	If appropriate, repeat these steps for any additional variables you want to add.

Automatically Incrementing a Variable

For example: To increment **`${counter}`**, use a Set Variable action to set **`${counter}`** with a value of **`${_trim(${__add("${counter}", "1")})}`**.

Built-In Variables

        - Cluster Node Hostname
        - Cluster Node ID
        - Cluster Node IP Address
        - Cluster Node Mode
        - Cluster Node Name
        - Cluster Node Running Time
        - Cluster Node Start Time
        - Command
        - Command Parameters
        - Custom Field 1
        - Custom Field 2
        - Description
        - Duration
        - Duration In Seconds
        - End Time
        - End Time: Average Estimated
        - End Time: Highest Estimated
        - End Time: Lowest Estimated
        - End Time: User Estimated
        - Execution User ID
        - Instance Number
        - Launch Time
        - Maximum Retry Count
        - Parent Workflow Instance sys_id
        - Parent Workflow Name
        - Queued Time
        - Reference Id
        - Retry Count
        - Retry Interval
        - Script ID
        - Script Name
        - Script Parameters
        - Starting Time
        - Task Instance Attempts
        - Task Instance Exit Code
        - Task Instance Name
        - Task Instance Status
        - Task Instance Status Description
        - Task Instance sys_id
        - Task Type
        - Time Zone (Task time zone)
        - Time Zone (Trigger time zone)
        - Top-Level Workflow Task Instance ID
    - Task Monitor Task Instance/Trigger Variables
        - Trigger Task Name
        - Trigger Task Status
        - Trigger Task sys_id
        - Trigger Task Type
        - Trigger Workflow
    - Trigger Variables
        - Trigger Name
        - Trigger Time
        - Trigger Time (Trigger time zone)
    - Variable Monitor Task Instance/Trigger Variables

Overview

Built-in variables are maintained by Universal Controller and provide information about task instances, agents, Universal Message Service (OMS), and cluster nodes. They can be used in free text fields in triggers, tasks, task actions, and email notifications for agents, OMS servers, and cluster nodes.

Supported built-in variables and their descriptions are provided below. All built-in variables are prefixed with `ops_`.

Built-In Variable Categories

Built-in variables are listed alphabetically within the following categories on this page:

- Agent Variables
- Agent-Based Task Instance Variables
- Agent Cluster Variables
- Application Monitor Trigger Variables
- Cluster Node Variables
- Common Variables
- Composite Trigger Variables
- Email Monitor Task Instance/Trigger Variables
- File Monitor Task Instance/Trigger Variables
- File Transfer Task Instance Variables
- FTP File Monitor Task Instance Variables
- OMS Server Variables
- PeopleSoft Task Instance Variables
- SAP Task Instance Variables
- SQL and Stored Procedure Task Instance Variables
- SQL Task Instance Variables
- Stored Procedure Task Instance Variables
- Stored Procedure Task Instance Variables
- System Monitor Task Instance Variables
- Task Instance Variables

Agent Variables

The following agent variables can be used to pass information into an Agent notification.

Agent Hostname

Description	Resolves to the agent hostname.
Syntax	${ops_agent_hostname}
Example	

Agent IP Address

Description	Resolves to the agent IP address (see `${ops_agent_ip}`, below.
Syntax	${ops_agent_ipaddr}
Example	

Agent IP Address

Description	Resolves to the agent IP address.
Syntax	${ops_agent_ip}
Example	

Agent Mode

Description	Resolves to the agent operational mode (Active, Offline).
Syntax	${ops_agent_mode}
Example	

Agent Name

Description	Resolves to the agent name.
Syntax	${ops_agent_name}
Example	

Agent Queue Name

Description	Resolves to the agent queue name. **Note** In the user interface, the queue name is labelled **Agent Id**.
Syntax	${ops_agent_id}
Example	

Note
Although they have the same syntax, ${ops_agent_id}, this Agent Queue Name Agent variable resolves to a different value than the Agent sys_id Agent-based task instance variable.

Agent-Based Task Instance Variables

The following variables can be used to pass agent information into agent-based task (Windows, Linux/Unix, z/OS, and SAP) notifications; see Creating Email Notifications and Creating SNMP Notifications.

Agent Hostname

Description	Resolves to the agent hostname.
Syntax	${ops_agent_hostname}
Example	

Agent IP Address

Description	Resolves to the agent IP address (see `${ops_agent_ip}`, below.
Syntax	${ops_agent_ipaddr}
Example	

Agent IP Address

Description	Resolves to the agent IP address.
Syntax	${ops_agent_ip}
Example	

Agent Name

Description	Resolves to the agent name.
Syntax	${ops_agent_name}
Example	

Agent sys_id

Description	Resolves to the sys_id of the agent.
Syntax	${ops_agent_id}
Example	

> **Note**
> Although they have the same syntax, ${ops_agent_id}, this Agent sys_id Agent-based task instance variable resolves to a different value than the Agent Queue Name Agent variable.

Agent Queue Name

Description	Resolves to the agent queue name. **Note** In the user interface, the queue name is labelled **Agent Id**.
Syntax	${ops_agent_queue_name}
Example	

Agent Cluster Variables

The following agent cluster variables can be used to pass information into an Agent Cluster notification.

Agent Cluster Name

Description	Resolves to the agent cluster name.
Syntax	${ops_agent_cluster_name}
Example	

Agent Cluster Distribution

Description	Resolves to the Distribution type for the agent cluster.
Syntax	${ops_agent_cluster_distribution}
Example	

Agent Cluster Task Execution Limit

Description	Resolves to the type of Task Execution Limit for the agent cluster.
Syntax	${ops_agent_cluster_limit_type}
Example	

Agent Cluster Suspended

Description	Resolves to the current suspension status of the agent cluster.
Syntax	${ops_agent_cluster_suspended}
Example	

Agent Cluster Task Execution Limit Amount

Description	Resolves to the maximum number of tasks that can be running at the same time by Agents in this agent cluster.
Syntax	${ops_agent_cluster_limit_max}
Example	

Agent Cluster Task Execution Current Limit

Description	Resolves to the current number of tasks currently being run by the Agents in this agent cluster.
Syntax	${ops_agent_cluster_limit_current}
Example	

Agent Cluster Network Alias

Description	Resolves to the Network Alias of this agent cluster.
Syntax	${ops_agent_cluster_network_alias}
Example	

Agent Cluster Network Alias Port

Description	Resolves to the Agent Port of this agent cluster.
Syntax	${ops_agent_cluster_network_alias_port}
Example	

Agent Cluster Notification State

Description	Resolves to the Notification State for which the notification matched.
Syntax	${ops_agent_cluster_notification_state}
Example	

Application Monitor Trigger Variables

When a task is launched by an Application Monitor trigger, the following built-in variables are passed into the task being launched by the trigger:

Trigger Application Name

Description	Resolves to the name of the Application being monitored by the trigger.
Syntax	${ops_trigger_appl_name}
Example	

Trigger Application Status

Description	Resolves to the status of the Application being monitored by the trigger.
Syntax	${ops_trigger_appl_status}
Example	

Trigger Application sys_id

Description	Resolves to the sys_id of the application.
Syntax	${ops_trigger_appl_id}
Example	

Trigger Application Type

Description	Resolves to the type of Application being monitored by the trigger, as defined by the Application Type field.
Syntax	${ops_trigger_appl_type}
Example	

Cluster Node Variables

The following cluster node variables allow you to pass information into a cluster node (Controller server) notification:

Cluster Node Hostname

Description	Resolves to the hostname of this cluster node.
Syntax	${ops_cluster_hostname}
Example	`ops_cluster_hostname = MACHINEC19A`

Cluster Node ID

Description	Resolves to the cluster node's internally-generated build ID.
Syntax	${ops_cluster_id}

Example	`ops_cluster_id = MACHINEC19A:8080-opswise`

Cluster Node IP Address

Description	Resolves to the IP address of this cluster node.
Syntax	${ops_cluster_ipaddr}
Example	`ops_cluster_ipaddr = 10.N.N.NN`

Cluster Node Mode

Description	Resolves to the current mode of this cluster node: Offline, Active, Passive. For more information, see Viewing Node Status.
Syntax	${ops_cluster_mode}
Example	`ops_cluster_mode = Active`

Cluster Node Name

Description	${ops_cluster_name} is an alias for the ${ops_cluster_id} variable.
Syntax	${ops_cluster_name}
Example	`ops_cluster_name = MACHINEC19A:8080-opswise`

Cluster Node Running Time

Description	Resolves to the numbers of days, hours, and minutes that this cluster node has been running since it was last started.

Syntax	${ops_cluster_uptime}
Example	`ops_cluster_uptime = 7 Seconds`

Cluster Node Start Time

Description	Resolves to the date and time the cluster node (server) was started.

Syntax	${ops_cluster_start_time}
Example	`ops_cluster_start_time = 2011-09-26 17:35:01 -0400`

Common Variables

The following variable is available for Task Instances, Agents, OMS Servers, and Cluster Nodes.

System Identifier

Description	Resolves to the value of the System Identifier Universal Controller system property.
Syntax	${ops_system_identifier}
Example	

Composite Trigger Variables

The following built-in variable is associated with the Composite Trigger type. This variable is only available for Composite Trigger components that have a Built-in Variable Prefix specified.

Trigger Component Event Time

Description	Resolves to the time when a Composite Trigger component fired.
Syntax	${<prefix>_trigger_component_event_time}
Example	

Email Monitor Task Instance/Trigger Variables

When one or more tasks are launched by an Email Monitor trigger after the conditions in its associated Email Monitor task are met, the built-in variables described below are passed into the tasks being launched by the trigger.

For example, the Email Monitor trigger may specify the launch of an Email task each time the associated Email Monitor task detects the status in a Mailbox folder. The Windows task might use one of these built-in variables as a command argument. Or, if the File Monitor task is not associated with a trigger but is running within a workflow, on completion you can propagate one or more of these built-in variable values to the parent workflow level using the Set Variable action. This allows you to pass information from the Email Monitor task to a successor task within the same workflow hierarchy.

Body Field

Description	Resolves to the Body field of the Email.
Syntax	${ops_trigger_email_body}
Example	

Cc Field

Description	Resolves to the Cc field of the Email.
Syntax	${ops_trigger_email_cc}
Example	

From Field

Description	Resolves to the From field of the Email.
Syntax	${ops_trigger_email_from}
Example	

HTML Body Field

Description	Resolves to the HTML Body field of the Email.
Syntax	${ops_trigger_email_body_html}
Example	

Received Date Field

Description	Resolves to the Received Date field of the Email.

Syntax	${ops_trigger_email_received_date}
Example	

Reply To Field

Description	Resolves to the Reply-To field of the Email.
Syntax	${ops_trigger_email_reply_to}
Example	

Sent Date Field

Description	Resolves to the Sent Date field of the Email.
Syntax	${ops_trigger_email_sent_date}
Example	

Subject Field

Description	Resolves to the Subject field of the Email.
Syntax	${ops_trigger_email_subject}
Example	

To Field

Description	Resolves to the To field of the Email.
Syntax	${ops_trigger_email_to}
Example	

File Monitor Task Instance/Trigger Variables

When one or more tasks are launched by a File Monitor trigger after the conditions in its associated File Monitor task are met, the built-in variables described below are passed into the tasks being launched by the trigger.

For example, the File Monitor trigger may specify the launch of a Windows task each time the associated File Monitor task detects the creation of a specific file. The Windows task might use one of these built-in variables as a command argument. Or, if the File Monitor task is not associated with a trigger but is running within a workflow, on completion you can propagate one or more of these built-in variable values to the parent workflow level using the Set Variable action. This allows you to pass information from the File Monitor task to a successor task within the same workflow hierarchy.

Base File Name

Description	Resolves to the base file name.
Syntax	${ops_trigger_file_name_simple}

File Directory

Description	Resolves to the directory where the new file was created, but not the file itself. If the existence or non-existence of the final directory separator is a requirement, we recommend the use of `${ops_trigger_file_fullpath}` and `${ops_trigger_file_fullpath_no_separator}`, respectively.
Syntax	${ops_trigger_file_path}
Example	

File Directory (with Final Directory Separator)

Description	Resolves to the directory where the new file was created, but not the file itself; includes the final directory separator.
Syntax	${ops_trigger_file_fullpath}
Example	

File Directory (without Final Directory Separator)

Description	Resolves to the directory where the new file was created, but not the file itself; does not include the final directory separator.
Syntax	${ops_trigger_file_fullpath_no_separator}
Example	

File Extension

Description	Resolves to the file extension of a file.
Syntax	${ops_trigger_file_name_extension}
Example	

Separator

Description	Resolves to the separator appropriate to the platform where the agent is running. For Windows, resolves to a backslash (\ ); for Linux/Unix, resolves to forward slash (/). This variable may be useful if you want to piece together a pathname using a combination of text and variables.

Syntax	${ops_trigger_file_separator}
Example	`${ops_trigger_file_fullpath}sub_folder_name` `${ops_trigger_file_separator}filename.txt`

Trigger File Date

Description	Resolves to the file date of the file that fired the trigger.
Syntax	${ops_trigger_file_date}
Example	

Trigger File Group

Description	Resolves to the file group of the file that fired the trigger.
Syntax	${ops_trigger_file_group}
Example	

Trigger File Name

Description	Resolves to the name of the file that fired the trigger.
Syntax	${ops_trigger_file_name}
Example	

Trigger File Name (No Path)

Description	Resolves to the name of the file that fired the trigger, but without any path information.
Syntax	${ops_trigger_file_name_nopath}
Example	

Trigger File Owner

Description	Resolves to the file owner of the file that fired the trigger.
Syntax	${ops_trigger_file_owner}

Example	

Trigger File Scan Result

Description	Resolves to the result of the file scan: FOUND or NOT_FOUND.
Syntax	${ops_trigger_file_scan}
Example	

Trigger File Size

Description	Resolves to the file size of the file that fired the trigger.
Syntax	${ops_trigger_file_size}
Example	

File Transfer Task Instance Variables

File Transfer variables are available for use in UDM scripts.

> **Note**
> These variables differ from all other built-in variables in that they are resolved by Universal Data Mover (UDM) on a UDM agent, not by the Universal Controller. File Transfer variables are sent to an agent unresolved and UDM performs all resolution for them. The resolved value is never available to the Controller.
>
> Unlike the syntax of built-in variables resolved by Universal Controller - **`${<variable-name>}`** - the syntax of File Transfer variables is the same as all UDM variables - **`$(<variable-name>)`**.

The following example illustrates the correct way to code them:

```
open src=srcserver user=$(ops_src_cred_user) pwd=$(ops_src_cred_pwd) dst=dstserver user=$(ops_dst_cred_user) pwd=$(ops_dst_cred_pwd)
```

Destination Password

Description	Resolves to the destination password.
Syntax	$(ops_dst_cred_pwd)
Example	

Destination User ID

Description	Resolves to the destination user ID.
Syntax	$(ops_dst_cred_user)
Example	

Source Password

Description	Resolves to the source password.
Syntax	$(ops_src_cred_pwd)
Example	

Source User ID

Description	Resolves to the source user ID.
Syntax	$(ops_src_cred_user)
Example	

FTP File Monitor Task Instance Variables

The following built-in variables are available for FTP File Monitor task instances and provide information about the file or file(s) that matched the monitor's criteria.

You can use these variables in an FTP File Monitor action or in a successor task instance by propagating one or more of these built-in variable values to a parent workflow using the Set Variable action.

Base Trigger File Name

Description	Resolves to the base file name.
Syntax	${ops_trigger_file_name_simple}
Example	

Files Matching Wildcard

Description	Resolves to a comma-separated list of files that matched the wildcard, if one was specified in the Remote Filename field in the FTP File Monitor task.

Syntax	${ops_trigger_files}
Example	`ops_trigger_files = COMPANY-2011-11-22.xls, COMPANY-2011-11-23.xls,COMPANY-2011-11-24.xls`

Remote Trigger File Name

Description	Resolves to the remote file name.
Syntax	${ops_trigger_file_name}
Example	

Remote Trigger File Name (No Path)

Description	Resolves to the remote file name without any path information.
Syntax	${ops_trigger_file_name_nopath}
Example	

Trigger File Directory

Description	Resolves to the directory where the remote file is located, but not the file itself. ${ops_trigger_file_path} is an alias for ${ops_trigger_file_fullpath_no_separator}.
Syntax	${ops_trigger_file_path}
Example	

Trigger File Directory (with Final Directory Separator)

Description	Resolves to the directory where the remote file is located, but not the file itself; includes the final directory separator.
Syntax	${ops_trigger_file_fullpath}
Example	

Trigger File Directory (without Final Directory Separator)

Description	Resolves to the directory where the remote file is located, but not the file itself; does not include the final directory separator.
Syntax	${ops_trigger_file_fullpath_no_separator}

Example	

Trigger File Extension

Description	Resolves to the file extension of the file.
Syntax	${ops_trigger_file_name_extension}
Example	

Trigger Wildcard

Description	Resolves to the contents of the Remote Filename field in the FTP File Monitor task.
Syntax	${ops_trigger_wildcard}
Example	`ops_trigger_wildcard = /home/prod/stonebranch/COMPANY*.xls`

Trigger Wildcard Path Only

Description	Resolves to the path only, with the final slash but without the file name, from the Remote Filename field in the FTP File Monitor task.
Syntax	${ops_trigger_wildcard_path}
Example	`ops_trigger_wildcard_path = /home/prod/stonebranch/`

Trigger Wildcard Path Only (without Final Slash)

Description	Resolves to the path only, without the final slash and without the file name, from the Remote Filename field in the FTP File Monitor task.
Syntax	${ops_trigger_wildcard_path_no_separator}
Example	`ops_trigger_wildcard_path_no_separator = /home/prod/stonebranch`

OMS Server Variables

The following OMS Server variables allow you to pass information into an OMS Server notification.

Last OMS Server Connected

Description	Resolves to the last OMS Server connected to the Controller in an OMS HA cluster.
Syntax	${ops_oms_last_connected}
Example	

OMS Server IP Address

Description	Resolves to the OMS Server IP address.
Syntax	${ops_oms_server_address}
Example	

OMS Server Status

Description	Resolves to the current status of the OMS Server.
Syntax	${ops_oms_status}
Example	

OMS Server sys_id

Description	Resolves to the sys_id of the OMS server.
Syntax	${ops_oms_id}
Example	

OMS Server Messaging Sessions Status

Description	Resolves to the current status of the OMS Server messaging sessions (heartbeat, input, output): Operational, Impaired, None.
Syntax	${ops_oms_session_status}
Example	

PeopleSoft Task and Task Instance Variables

The following built-in variables are available for PeopleSoft tasks and task instances:

Distribution Status

(For task instances only.)

Description	Resolves to the PeopleSoft task instance Distribution Status.
Syntax	${ops_distribution_status}
Example	

Main Job Name

Description	Resolves to the PeopleSoft Main Job Name.
Syntax	${ops_main_job_name}
Example	

Main Schedule Name

Description	Resolves to the PeopleSoft task/task instance Main Schedule Name.
Syntax	${ops_main_schedule_name}
Example	

Process Instance

(For task instances only.)

Description	Resolves to the PeopleSoft task instance Process Instance.
Syntax	${ops_process_instance}
Example	

Process Name

Description	Resolves to the PeopleSoft task/task instance Process/Job Name.
Syntax	${ops_process_name}

Example	

Process Type

Description	Resolves to the PeopleSoft task/task instance Process Type.
Syntax	${ops_process_type}
Example	

Run Status

(For task instances only.)

Description	Resolves to the PeopleSoft task instance Run Status.
Syntax	${ops_run_status}
Example	

SAP Task Instance Variables

For an SAP task instance, where applicable, the following built-in variables resolve to the SAP jobname and SAP jobid of the job running in the SAP system. If you need to use the SAP jobname and/or the SAP jobid from one SAP task instance in a successor SAP task instance, you can use the Set Variable action to propagate these built-in variable values to the parent workflow.

SAP InfoPackage Request ID

Description	Resolves to the SAP InfoPackage Request ID.
Syntax	${ops_sap_requestid}
Example	

SAP Job ID

Description	Resolves to the SAP job ID.
Syntax	${ops_sap_jobid}
Example	

SAP Job Name

Description	Resolves to the SAP job name.
Syntax	${ops_sap_jobname}
Example	

SAP Process Chain ID

Description	Resolves to the SAP Process Chain ID.
Syntax	${ops_sap_chainid}
Example	

SAP Process Chain Log ID

Description	Resolves to the SAP Process Chain Log ID.
Syntax	${ops_sap_logid}
Example	

SQL and Stored Procedure Task Instance Variables

The following built-in variables are used in SQL tasks and Stored Procedure tasks to collect SQLException data, if any:

Error Message

Description	Resolves to any error message generated by the database.
Syntax	${ops_sql_error_msg}
Example	

Processed Rows

Description	Resolves to the number of rows processed.
Syntax	${ops_sql_rows}
Example	

Return Code for SQL Statement Outcome

Description	Resolves to a return code that indicates the outcome of the most recently executed SQL statement.
Syntax	${ops_sql_state}
Example	

SQL Task Instance Variables

The following built-in variable is available for SQL task instances.

SQL Command Field

Description	Resolves to the value of the SQL Command field.
Syntax	${ops_sql_command}
Example	

Stored Procedure Task Instance Variables

The following built-in variable is available for Stored Procedure task instances and provides information about the stored procedure itself.

Stored Procedure Name

Description	Resolves to the value from the Stored Procedure Name field.
Syntax	${ops_stored_proc_name}
Example	

System Monitor Task Instance Variables

The following System Monitor variables show the results for **Resource Available** and **Actual Available** that can be utilized in System Monitor tasks.

Actual Size

Description	Actual size determined by the agent.
Syntax	${ops_sm_actual_size}
Example	

Actual Size (Rounded)

Description	Same as ops_sm_actual_size, except rounded to the nearest integer.
Syntax	${ops_sm_actual_int_size}
Example	

Actual Size (Scale)

Description	Scale of the actual size determined by the agent.
Syntax	${ops_sm_actual_scale}
Example	

Scale

Description	Scale specified in the **By Scale** field for **Resource Available** of the System Monitor task definition.
Syntax	${ops_sm_scale}
Example	

Size

Description	Size specified in the **Resource Available** field of the System Monitor task definition.
Syntax	${ops_sm_size}
Example	

Size (Rounded)

Description	Same as ops_sm_size, except that ops_sm_int_size is rounded to the nearest integer.
Syntax	${ops_sm_int_size}
Example	

Task Instance Variables

The following built-in variables are associated with task instances for all task types.

Cluster Node Hostname

Description	Resolves to the hostname of the Active cluster node.
Syntax	${ops_cluster_hostname}
Example	`ops_cluster_hostname = MACHINEC19A`

Cluster Node ID

Description	Resolves to the Active cluster node's internally-generated build ID.
Syntax	${ops_cluster_id}
Example	`ops_cluster_id = MACHINEC19A:8080-opswise`

Cluster Node IP Address

Description	Resolves to the IP address of the Active cluster node.
Syntax	${ops_cluster_ipaddr}
Example	`ops_cluster_ipaddr = 10.N.N.NN`

Cluster Node Mode

Description	Resolves to the current mode of the cluster node: Offline, Active, Passive. For more information, see Viewing Node Status.
Syntax	${ops_cluster_mode}
Example	`ops_cluster_mode = Active`

Cluster Node Name

Description	${ops_cluster_name} is an alias for the ${ops_cluster_id} variable.
Syntax	${ops_cluster_name}
Example	`ops_cluster_name = MACHINEC19A:8080-opswise`

Cluster Node Running Time

Description	Resolves to the numbers of days, hours, and minutes that the Active cluster node has been running since it was last started.
Syntax	${ops_cluster_uptime}
Example	`ops_cluster_uptime = 7 Seconds`

Cluster Node Start Time

Description	Resolves to the date and time the Active cluster node (server) was started.
Syntax	${ops_cluster_start_time}
Example	`ops_cluster_start_time = 2011-09-26 17:35:01 -0400`

Command

Description	For tasks that launch a command on a Windows or Linux/Unix machine; resolves to the task command.
Syntax	${ops_cmd}
Example	

Command Parameters

Description	For tasks that launch a command on a Windows or Linux/Unix machine; resolves to the task command parameters.

Syntax	${ops_cmd_parms}
Example	

Custom Field 1

Description	Resolves to the value of user-defined field #1.
Syntax	${ops_custom_field1}
Example	

Custom Field 2

Description	Resolves to the value of user-defined field #2.
Syntax	${ops_custom_field2}
Example	

Description

Description	Resolves to the value of the Task Description field.
Syntax	${ops_description}
Example	

Duration

Description	Resolves to the task instance Duration.
Syntax	${ops_duration_text}
Example	ops_duration_text = 2 Minutes 10 Seconds

Duration In Seconds

Description	Resolves to the task instance Duration In Seconds.
Syntax	${ops_duration}
Example	ops_duration = 130000

End Time

Description	Resolves to the task ending time.
Syntax	${ops_end_time}
Example	

End Time: Average Estimated

Description	Resolves to the Average Estimated End Time in the server's time zone.
Syntax	${ops_avg_estimated_end_time}
Example	${ops_avg_estimated_end_time} > 2018-10-16 15:01:45 -0400

End Time: Highest Estimated

Description	Resolves to the Highest Estimated End Time in the server's time zone.
Syntax	${ops_highest_estimated_end_time}
Example	${ops_highest_estimated_end_time} > 2018-10-16 15:01:45 -0400

End Time: Lowest Estimated

Description	Resolves to the Lowest Estimated End Time in the server's time zone.
Syntax	${ops_lowest_estimated_end_time}
Example	${ops_lowest_estimated_end_time} > 2018-10-16 15:01:44 -0400

End Time: User Estimated

Description	Resolves to the User Estimated End Time in the server's time zone.
Syntax	${ops_user_estimated_end_time}
Example	${ops_user_estimated_end_time} > 2018-10-16 15:01:54 -0400

Execution User ID

Description	Resolves to the ID of the user who launched the task or to the ID of the user who enabled the trigger that launched the task.

Syntax	${ops_execution_user}
Example	

Instance Number

Description	Resolves to the sequentially assigned number, maintained per task, representing the creation order of the instance. For example, if you launch a task twice, the first task instance will have instance number 1, and the second task instance will have instance number 2.
Syntax	${ops_instance_number}
Example	

Launch Time

Description	Resolves to the task launch time. For workflows, all descendants will have the same launch time as the top-level workflow.
Syntax	${ops_launch_time}
Example	

Maximum Retry Count

Description	Resolves to the maximum retry count.
Syntax	${ops_retry_maximum}
Example	

Parent Workflow Instance sys_id

Description	Resolves to the sys_id of the parent workflow task instance.
Syntax	${ops_workflow_id}
Example	

Parent Workflow Name

Description	Resolves to the name of the parent workflow.
Syntax	${ops_workflow_name}
Example	

Queued Time

Description	Resolves to the date and time that the task was queued for processing.
Syntax	${ops_queued_time}
Example	

Reference Id

Description	Resolves to the sequentially assigned number, maintained per task, representing the creation order of the instance. For example, if you launch a task twice, the first task instance will have instance number 1, and the second task instance will have instance number 2. **Note** Although it still is supported, the Reference Id built-in variable has been superseded by the Instance Number built-in variable.
Syntax	${ops_task_ref_count}
Example	

Retry Count

Description	Resolves to the current retry count.
Syntax	${ops_retry_count}
Example	

Retry Interval

Description	Resolves to the retry interval (seconds).
Syntax	${ops_retry_interval}
Example	

Script ID

Description	For Windows, Linux/Unix, and SAP tasks where a Script or SAP Definition from Scripts is specified; resolves to the Controller system ID of the script.
Syntax	${ops_script_id}

Example	

Script Name

Description	For Windows, Linux/Unix, and SAP tasks where a Script or SAP Definition from Scripts is specified; resolves to the Controller name of the script.
Syntax	${ops_script_name}
Example	

Script Parameters

Description	For tasks that run a script on a Windows or Linux/Unix machine; resolves to the task script parameters.
Syntax	${ops_script_parms}
Example	

Starting Time

Description	Resolves to the task starting time.
Syntax	${ops_start_time}
Example	

Task Instance Attempts

Description	Resolves to the current task instance attempt count. Each Re-run operation increments the attempt. Initial attempt is 1.
Syntax	${ops_attempt}
Example	

Task Instance Exit Code

Description	Resolves to the task instance exit code, if any.
Syntax	${ops_exit_code}
Example	

Task Instance Name

Description	Resolves to the task instance name.
Syntax	${ops_task_name}
Example	

Task Instance Status

Description	Resolves to the current task instance status.
Syntax	${ops_status}
Example	

Task Instance Status Description

Description	Resolves to the task instance status description.
Syntax	${ops_status_description}
Example	

Task Instance sys_id

Description	Resolves to the sys_id of the task instance.
Syntax	${ops_task_id}
Example	

Task Type

Description	Resolves to the task type.
Syntax	${ops_task_type}
Example	

Time Zone (Task time zone)

Description	Resolves to the time zone of the task instance, as specified by the Time Zone Preference field.
Syntax	${ops_task_time_zone}
Example	

Time Zone (Trigger time zone)

Description	Resolves to the time zone of the trigger that launched the task. If the task was launched by the Trigger Now/Launch Task command, the built-in variable will resolve to the command's time zone option, or if no time zone option was specified, the server time zone.
Syntax	${ops_time_zone}
Example	

Top-Level Workflow Task Instance ID

Description	Resolves to the sys_id of the top-level workflow task instance.
Syntax	${ops_top_level_workflow_id}
Example	

Task Monitor Task Instance/Trigger Variables

When the conditions of a Task Monitor task are met and its associated Task Monitor trigger launches one or more tasks, the following built-in variables are passed into the task instances being launched by the trigger.

For example, the Task Monitor trigger may specify an Email task that will launch each time the conditions in the associated Task Monitor task are met. You might want to specify one or more of these variables in the body of the email.

If the Task Monitor task is not associated with a trigger but is running within a workflow, on completion you can propagate one or more of these built-in variable values to the parent workflow level by using the Set Variable action. This allows you to pass information from the Task Monitor task to a successor task within the same workflow hierarchy.

Trigger Task Name

Description	Resolves to the name of the task instance that fired the trigger.
Syntax	${ops_trigger_task_name}
Example	

Trigger Task Status

Description	Resolves to the status of the task instance that fired the trigger.
Syntax	${ops_trigger_task_status}
Example	

Trigger Task sys_id

Description	Resolves to the sys_id of the task instance that fired the trigger.
Syntax	${ops_trigger_task_id}
Example	

Trigger Task Type

Description	Resolves to the type of the task instance that fired the trigger.
Syntax	${ops_trigger_task_type}
Example	

Trigger Workflow

Description	Resolves to the name of the workflow instance that fired the trigger. This variable is available only for a Task Monitor task that has a Workflow Condition specified. If a workflow condition is specified, **`${ops_trigger_workflow_name}`** will resolve to the name of the workflow instance that the workflow condition matched.
Syntax	${ops_trigger_workflow_name}
Example	

Trigger Variables

The following built-in variables are associated with all trigger types.

When a task is launched by a trigger, the values of the following built-in variables, if they are specified in the task, are passed into the task instance.

Trigger Name

Description	Resolves to the name of the trigger that launched the task instance.
Syntax	${ops_trigger_name}
Example	

Trigger Time

Description	Resolves to the scheduled time of the trigger or, if the trigger is not scheduled, the actual trigger time. If the task is triggered by date/time, it resolves to that specified date/time.
Syntax	${ops_trigger_time}
Example	

Trigger Time (Trigger time zone)

Description	Resolves to the trigger time in the time zone of the trigger.
Syntax	${ops_trigger_time_tz}
Example	

Variable Monitor Task Instance/Trigger Variables

When the conditions of a Variable Monitor task are met and its associated Variable Monitor trigger launches one or more tasks, the following built-in variables are passed into the task instances being launched by the trigger.

For example, the Variable Monitor trigger may specify an Email task that will launch each time the conditions in the associated Variable Monitor task are met. You might want to specify one or more of these variables in the body of the email.

If the Variable Monitor task is not associated with a trigger but is running within a workflow, on completion you can propagate one or more of these built-in variable values to the parent workflow level by using the Set Variable action. This allows you to pass information from the Variable Monitor task to a successor task within the same workflow hierarchy.

Trigger Variable Name

Description	Resolves to the name of the variable being monitored.
Syntax	${ops_trigger_variable_name}
Example	

Trigger Variable Value

Description	Resolves to the current value of the variable being monitored.
Syntax	${ops_trigger_variable_value}
Example	

Trigger Variable Previous Value

Description	Resolves to previous value of the variable being monitored.
Syntax	${ops_trigger_variable_prev_value}
Example	

Web Service Task Instance Variables

The following built-in variables are available for Web Service task instances:

URL

Description	Resolves to the entire encoded URL containing the host, port, path and query.
Syntax	${ops_url}
Example	

Raw Value of URL

Description	Resolves to the raw value of the URL field.
Syntax	${ops_url_raw}
Example	

URL Host

Description	Resolves to the URL host.
Syntax	${ops_url_host}
Example	

URL Port

Description	Resolves to the URL port.
Syntax	${ops_url_port}
Example	

URL Path

Description	Resolves to the encoded URL path.
Syntax	${ops_url_path}
Example	

Unencoded URL Path

Description	Resolves to the unencoded URL path.
Syntax	${ops_url_path_unencoded}
Example	

URL Query

Description	Resolves to the URL query.
Syntax	${ops_url_query}
Example	

Unencoded URL Query

Description	Resolves to the unencoded URL query.
Syntax	${ops_url_query_unencoded}
Example	

z/OS Task Instance Variables

The following built-in variables are available for z/OS task instances:

JCL Location

Description	Resolves to the file and member name containing the JCL script.
Syntax	${ops_jcl_location}
Example	

Job Number

Description	Resolves to the job number assigned to the job by JES.
Syntax	${ops_job_id}
Example	

Override JCL Location

Description	Resolves to the file and member name of the JCL location containing a potential override JCL script.
Syntax	${ops_override_jcl_location}
Example	

Submitted JCL Location

Description	Resolves to the file and member name of the JCL location that was actually used for job submission.
Syntax	${ops_submitted_jcl_location}
Example	

Launching With Variables

For information on how to launch a task with variables, see Provide Temporary Variable Values and Launch a Task Manually on the Manually Running and Controlling Tasks page.

Trigger With Variables

For information on how to use variables when manually launching tasks associated with a trigger, see Triggering with Variables (in the Triggers and Calendars section of this documentation).

Creating a Set Variable Action within a Task or Workflow

Overview

The Set Variable action allows you to set a variable to a specific value for a task or workflow, and to select a scope (level of usage) for that variable (see Variables and Variable Scope, below). Unless you set the scope of the variable to **GLOBAL**, which specifies that the variable can be accessed at any time by any task, workflow, or trigger, the value exists in memory only for the time that the task or workflow is running, or until another Set Variable action sets the variable to another value.

Note
Variables with a Variable Scope set to **GLOBAL** are added to the list of global variables on the Variables list (**Automation Center > Other > Variables**) after the task or workflow is run.

You can use the Set Variable action to create a new variable or modify an existing variable.

When creating a Set Variable action, you can trigger the Set Variable action based on one or more of the following:

- Status
- Exit codes
- Late start
- Late or early finish

Variables and Variable Scope

A variable defined for a task under the **Variables** tab for that task is used only by that task.

A variable defined for a workflow under the **Variables** tab for that workflow is available for any task in that workflow; a task will use the variable value defined for the workflow unless the variable is defined for that task.

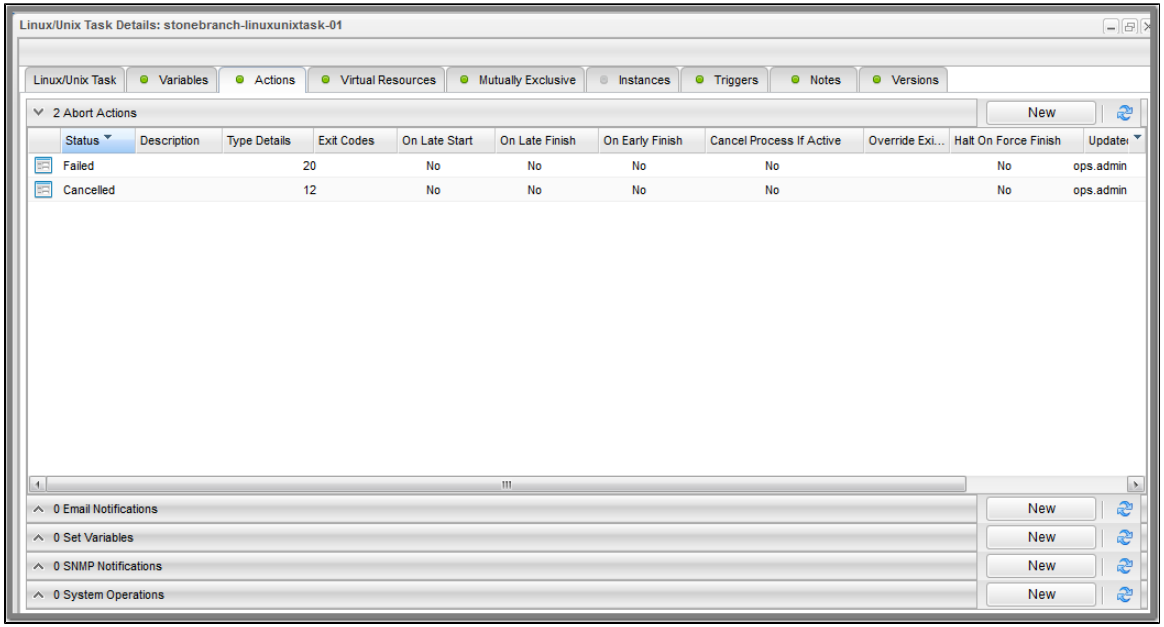
A variable defined for a task or workflow in the Set Variable Action Details lets you specify, in the Variable Scope field, the scope of that variable. You can specify that a variable be available for:

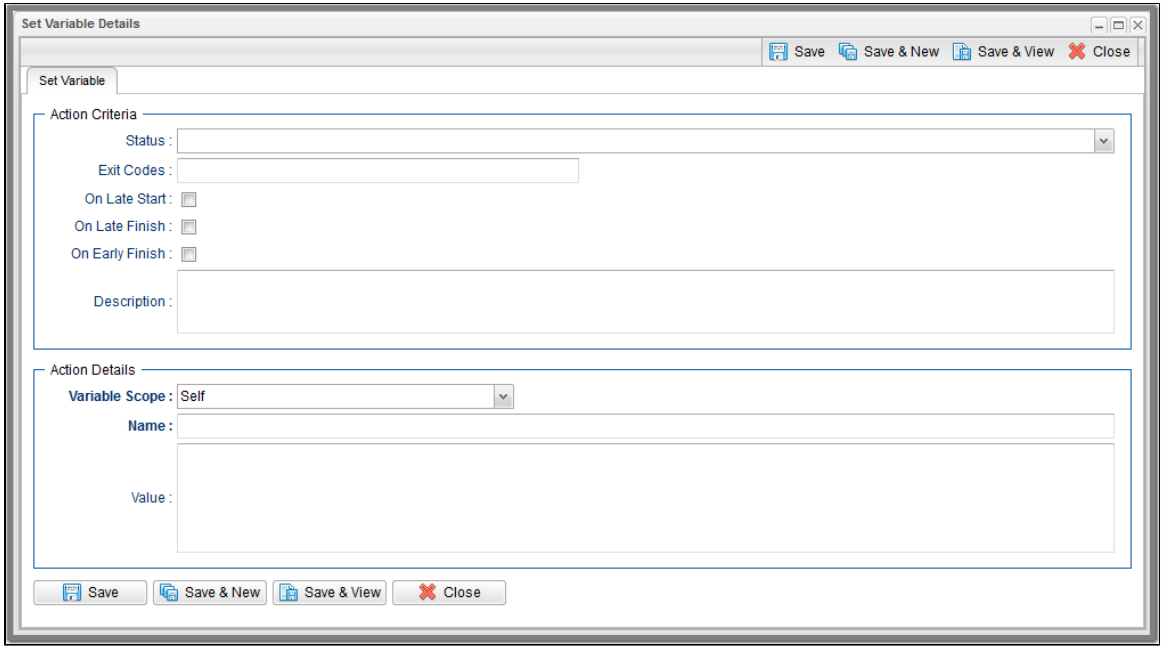
- Only the task where it is set.
- All tasks within the task's parent (immediate) workflow.
- All tasks within the task's top-level parent workflow.
- All tasks and workflow instances.

For example, if you set a variable for a task to be available within the scope of its parent workflow, the value of that variable is propagated up to the parent workflow level. As each task in the workflow is run, that value is available for that task.

Creating a Set Variable Action

Step 1	Display the Task Details of the task for which you are creating the Set Variable action.
Step 2	Click the **Actions** tab. A list of any defined Actions for that task displays.



Step 3	Click the **New** button that displays on the Set Variables row. The Set Variable Details pop-up displays. 
Step 4	Using the field descriptions below as a guide, complete the fields as needed.
Step 5	Click a **Save** button to save the record in the Controller database.
Step 6	If appropriate, repeat these steps for any additional Set Variable actions you want to create.

Set Variable Details Field Descriptions

The table below describes the fields and buttons in the Set Variable Details.

Field Name	Description
Action Criteria	This section contains criteria for performing the action.
Type Details	Displays - on the Set Variables actions list - the Variable Scope, Name, and Value for this action.

Action Inheritance	For Workflow tasks only; the records that this action applies to. Options: • Self The action applies only to the workflow; it is not inherited by its children tasks. For example, if the action is defined for the Defined status, when the workflow where the action is specified transitions into the Defined status, the action will run for the workflow. When children tasks within this workflow transition into the Defined status, the action will not run. • Self/Children The action applies to the workflow and any children under the workflow (it is as if each child under the workflow had the action specified on itself). For example, if the workflow or any of its children transition into the Defined status, the action will run. • Children This action applies only to the children under the workflow and not the workflow itself. For example, if any child of this workflow transitions into the Defined status, the action will run. However, when the workflow where this action is specified transitions into the Defined status, this action will not run.
Status	The status of the task, by itself or together with an exit code, that will trigger this Set Variable action. You can specify as many statuses as needed.
Exit Codes	Specifies one or more exit codes that will trigger the event. If you specify an exit code, you must also specify at least one status. Use commas to separate multiple exit codes; use a hyphen to specify a range. Example: 1, 5, 22-30.
On Late Start	Generates the action or notification if the task started late, based on the Late Start Time specified in the task.
On Late Finish	Generates the action or notification if the task finishes late, based on the Late Finish time specified in the task.
On Early Finish	Generates the action or notification if the task finishes early, based on the Early Finish Time specified in the task.
Description	Description of this action.
Action Details	This section contains additional details about the action.

Variable Scope

Applies to variables associated with a task in a workflow.

Options:

Scope	Scope Value	Description
Self	1	The variable is updated or created in the scope of the task instance running the action. If the task instance is a workflow, then any child of that workflow will be able to read that variable.
Parent	2	The variable is updated or created in the immediate parent workflow scope, allowing a child within a workflow to make a variable available to any other child in the same workflow (at the same level).
Top Level Parent	3	The variable is updated or created at the top-level workflow variable scope, allowing a child anywhere in the workflow hierarchy to make a variable available to any other child in the workflow hierarchy, regardless of which level in the workflow the task instances are running.
Global	4	A global variable will be updated and or created. Allows for variables to be shared across independent workflows.

System Notification

If Variable Scope = Global; Status of the Set Variable action that will trigger a system notification.

Options:

- None
- Operation Failure (default)
- Operation Success/Failure
- Operation Success

Note
The Controller must be configured for system notifications in order for system notifications to be triggered.

Name

Name of the variable. Up to 128 alphanumerics. The name must begin with an alphabetic character and can consist of: alphas (a-z, A-Z), numerics 0-9, _ (underscore). White spaces are not permitted; names are not case-sensitive.

Important
Do not define variables with the prefix **ops**_. The **ops**_ prefix is reserved for built-in variables.

Value	Value of the variable. **Note** While a global variable value can never exceed 4000 characters, a task instance variable value assigned dynamically at run time (for example, using a function to assign a variable value to Self, Parent, or Top Level Parent, using the Set Variable Action, can exceed the 4000 character limit. Keep in mind, however, that the Maximum Nested Variable Expansion Universal Controller system property prevents unlimited variable value expansion.
Metadata	This section contains Metadata information about this record.
UUID	Universally Unique Identifier of this record.
Updated By	Name of the user that last updated this record.
Updated	Date and time that this record was last updated.
Created By	Name of the user that created this record.
Created	Date and time that this record was created.
Buttons	This section identifies the buttons displayed above and below the Action Details that let you perform various actions.
Save	Saves a new Action record in the Controller database.
Save & New	Saves a new record in the Controller database and redisplays empty Details so that you can create another new record.
Save & View	Saves a new record in the Controller database and continues to display that record.
New	Displays empty (except for default values) Details for creating a new record.
Update	Saves updates to the record.
Delete	Deletes the current record.
Refresh	Refreshes any dynamic data displayed in the Details.
Close	Closes the Details pop-up of this action.

Listing and Setting Variables from the Command Line

To list and set variables from the command line, use the List Variables (ops-variable-list) and Set Variables (ops-variable-set) commands of the Universal Controller Command Line Interface (CLI).

Functions

- Raw Output from Web Service Task
- Raw Output from Sibling Web Service Task
- XML Output Data from Web Service Task
- XML Output Data From Sibling Web Service Task
- JSON Output Data From Web Service Task
- JSON Output Data From Sibling Web Service Task
- JSON Output Data As Array From Web Service Task
- JSON Output Data As Array From Sibling Web Service Task

Overview

Variables and functions can be used in free-text fields within tasks and workflows. When a variable or function is specified in a free-text field, the Controller inserts its value into the field when the task or workflow is run.

Also, triggers can pass variables and functions into the tasks and workflows they launch.

Universal Controller supports a number of functions that can be specified in free-text fields. They are resolved when a task instance runs or when a Set Variable action containing a function is executed.

Functions are entered using the following formats:

```
${_function}
${_function(arg1, ..., argN)}
```

Formatting Rules

- Functions *must* be written either:
  - In all lower-case characters.
  - Exactly as shown in the tables on this page.
- Functions have zero, one, or multiple parameters.
- Each function parameter is one of three specific types:
  - String
  - Integer
  - Boolean
- String parameters *must* be enclosed in **single or double** quotation marks.
- Integer and Boolean parameters *can* be enclosed in **single or double** quotation marks.
- Optional parameters are identified on this page by being enclosed in [square brackets]. When copying a function from the documentation, be sure to remove the square brackets; otherwise, the function will not resolve.
- If a function has more than one optional parameter, any optional parameters preceding a specified optional parameter must be included in the function's parameter list. For example:
  - For function `${_responseJsonPath('pathExpression'[,'defaultValue','delimiter',prettyPrint])}`, usage `${_responseJsonPath('.outputData','','',true)}` would be valid, whereas `${_responseJsonPath('.outputData',,,true)}` would not be valid.
  - For function `${_formatDate(['date', 'format', day_offset, use_business_days, hour_offset, minute_offset, timezone])}`, usage `${_formatDate('2018-09-01','',0,true)}` would be valid, whereas `${_formatDate('2018-09-01','',,true)}` would not be valid.
- All functions allow nesting to two levels. That is, a function can be an argument to another function, which itself can be an argument to another function.
  - You must use a double underscore preceding the name of a first-level nested function.

- You must use a triple underscore preceding the name of a second-level nested function.

For example, for 2nd day of next month less one Business Day:

```
${_formatDate('${__dayOfMonth(2,'${___dateadv('yyyy-MM-dd',0,1)}')}','',-1,true)}
```

Function Categories

Functions are listed alphabetically within the following categories on this page:

Conditional Functions

Return Conditional Value Depending on Equality of String Parameters

Description	Returns a conditional value depending on the equality of two string parameters. (Returns `if_value` if string `value1` is equal to string `value2`; otherwise, `else_value` is returned.)
Syntax	**`${_ifEqual`**`('value1', 'value2', 'if_value', 'else_value'[, ignore_case])}`
Parameters	• `value1` Required; First string. • `value2` Required; Second string. • `if_value` Required; Return value if `value1` equals `value2`. • `else_value` Required; Return value if `value1` does not equal `value2`. • `ignore_case` Optional; Specification (**true** or **false**) whether or not to ignore case when comparing `value1` and `value2`. Default is false.

Examples	`${_ifEqual('abc','def','YES','NO')}`
	`${_ifEqual('abc','ABC','YES','NO',true)}`
	`${_ifEqual('2015-08-15','${__date()}','17:00','18:00')}`

Return Conditional Value Depending on Value of Boolean Parameter

Description	Returns a conditional value depending on the value of a boolean parameter. Returns `if_value` if `value` is **true**; otherwise, `else_value` is returned.
Syntax	**`${_ifTrue`**`(value, 'if_value', 'else_value')}`
Parameters	• `value` Required; Boolean value (**true** or **false**). • `if_value` Required; Return value if `value` is **true**. • `else_value` Required; Return value if `value` is **false**.
Example	`${_ifTrue(${__isToday('Mon', 'E')},'20:00','22:00')}`

Credential Functions

Return User Name of a Credential

Description	Returns a token representing the Resolvable Credential from which you want to embed the corresponding Runtime User.
Syntax	**`${_credentialUser`**`('<credential_name>')}`
Parameters	• `credential_name` Required; Name of the Credential.

Return User Password of a Credential

Description	Returns a token representing the Resolvable Credential from which you want to embed the corresponding Runtime Password.
Syntax	**`${_credentialPwd`**`('<credential_name>')}`
Parameters	• `credential_name` Required; Name of the Credential.

Date Functions

Checks if Date Argument Equals Today's Date

Description	Checks if a date argument is equal to today's date in the specified format. Returns **true** if `date` is equal to today's date in the specified format; otherwise, **false** is returned.
Syntax	**`${_isToday`**`('date'[, 'format', is_relative])}`
Parameters	• `date` Required; Date to compare to today's date. • `format` Optional; Format of today's date. Default is yyyy-MM-dd. • `is_relative` Optional; Specification (**true** or **false**) for whether today's date is relative to the trigger/launch time of the task instance. Default is false.
Examples	`${_isToday('Wed', 'E')}` `${_isToday('${__dayOfMonth(1,'','',true)}')}`

Resolve to Current Date and Time

Description	Resolves to the current date and time.
Syntax	**`${_date`**`(['format', day_offset, hour_offset, minute_offset])}`

Parameters	• `format` Optional; Date format. Default format is yyyy-MM-dd HH:mm:ss Z. For details on the `format` parameter, see https://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html • `day_offset` Optional; +/- number of days to offset. • `hour_offset` Optional; +/- number of hours to offset. • `minute_offset` Optional; +/- number of minutes to offset.

Examples	`${_date} --> 2012-07-14 12:43:06 -0400`
	`${_date()} --> 2012-07-14 12:43:06 -0400`
	`${_date('yyyy-MM-dd', 5)} --> 2012-07-19`
	`${_date('yyyy-MM-dd HH:mm:ss', -2, -1)} --> 2012-07-12 11:43:06`
	`${_date('', 0, 0, 10)} --> 2012-07-14 12:53:06 -0400`

Resolve to Current Date and Time (Advanced)

Description	Resolves to the current date and time.
Syntax	**`${_dateadv`**`(['format', year_offset, month_offset, day_offset, hour_offset, minute_offset])}`
Parameters	• `format` Date format. Default format is yyyy-MM-dd HH:mm:ss Z. For details on the `format` parameter, see http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html • `year_offset` Optional; +/- number of years to offset. • `month_offset` Optional; +/- number of months to offset. • `day_offset` Optional; +/- number of days to offset. • `hour_offset` Optional; +/- number of hours to offset. • `minute_offset` Optional; +/- number of minutes to offset.

Examples	`${_dateadv} --> 2012-07-29 09:31:42 -0700`
	`${_dateadv('yyyy-MMM', -1)} --> 2011-Jul`
	`${_dateadv('yyyy-MMM', 0, -1)} --> 2012-Jun`

Resolve to Current Unix Epoch Time

Description	Resolves to the current time in milliseconds since Wed Dec 31 1969 19:00:00 GMT-0500 (EST) – the start of Unix epoch time.
Syntax	**`${_currentTimeMillis}`**
Parameters	n/a

Return Date with Offsets

Description

Returns the date after applying offsets. Optionally, can specify the output format.

Whether a holiday is treated as a business day or a non-business day is specified by the Exclude Holidays for Business Days Universal Controller system property.

Syntax

`${_formatDate``(['date', 'format', day_offset, use_business_days, hour_offset, minute_offset, timezone])}`

Parameters

- `date`
  Date in format yyyy-MM-dd HH:mm or yyyy-MM-dd. Time (HH:mm) is optional. Default is the current date and time.
- `format`
  Format of returned date. Default is the format used when specifying the date parameter: yyyy-MM-dd HH:mm or yyyy-MM-dd. For details on the `format` parameter, see http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html
- `day_offset`
  +/- number of days to offset.
- `use_business_days`
  Specification (`true` or `false`) for whether `day_offset` is for business days. Default is false.
- `hour_offset`
  +/- number of hours to offset.
- `minute_offset`
  +/- number of minutes to offset.
- `timezone`
  Time Zone that the date is formatted in.

Example

```
${_formatDate} --> 2018-08-24 15:37
${_formatDate()} --> 2018-08-24 15:37
${_formatDate('','MMddyyyy',5)} --> 08292018
${_formatDate('2018-09-01','',5)} --> 2018-09-06
${_formatDate('2018-09-01','',-5)} --> 2018-08-27
${_formatDate('2018-10-13 12:13:14 -0400','',5,true,0,0,'Australia/Sydney')} --> 2018-10-14 03:13:14 +1100
```

Return Date with Offsets (Advanced)

Description	Returns the date after applying offsets. Optionally, can specify the output format. ⚠ Whether a holiday is treated as a business day or a non-business day is specified by the Exclude Holidays for Business Days Universal Controller system property.
Syntax	**`${_formatDateAdv`**`(['date', 'format', year_offset, month_offset, day_offset, use_business_days, hour_offset, minute_offset, timezone])}`
Parameters	• `date` Optional; Date in format yyyy-MM-dd HH:mm or yyyy-MM-dd. Time (HH:mm) is optional. Default is the current date and time. • `format` Optional; Format of returned date. Default is the format used when specifying the date parameter: yyyy-MM-dd HH:mm or yyyy-MM-dd. For details on the `format` parameter, see http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html • `year_offset` Optional; +/- number of years to offset. • `month_offset` Optional; +/- number of months to offset. • `day_offset` Optional; +/- number of days to offset. • `use_business_days` Optional; Specification (**true** or **false**) for whether `day_offset` is for business days. Default is false. • `hour_offset` +/- number of hours to offset. • `minute_offset` +/- number of minutes to offset. • `timezone` Time Zone that the date is formatted in.

Examples	`${_formatDateAdv} --> 2012-08-24 15:55`
	`${_formatDateAdv()} --> 2012-08-24 15:55`
	`${_formatDateAdv('','MMddyyyy',1)} --> 08242013`
	`${_formatDateAdv('2012-09-01','',0,1)} --> 2012-10-01`
	`${_formatDateAdv('2012-09-01','',0,-1)} --> 2012-08-01`
	`${_formatDateAdv('2012-09-01','',0,0,5,false)} --> 2012-09-06`

Return Date with Time Zone

Description	Returns the Date and Time in another time zone.
Syntax	**`${_formatDateTz`**`(\'date-time', 'target-time-zone'[, 'output-format'])}`

Parameters	• `date-time`
	Date and time in any of the following formats:
	  • yyyy-MM-DD HH:mm
	  • yyyy-MM-DD HH:mm:ss
	  • yyyy-MM-DD HH:mm Z
	  • yyyy-MM-DD HH:mm:ss Z.
	  • yyyy-MM-DD HH:mm:ss.SSS
	  • yyyy-MM-DD HH:mm:ss.SSS Z.
	• `target-time-zone`
	Time zone in which to format the date and time.
	• `output-format`
	Optional; Format of the date and time in the other time zone.

Examples	`${_formatDateTz('2018-10-13 01:02:03 -0400', 'Australia/Sydney')} --> 2018-10-13 16:02:03 +1100`
	`${_formatDateTz('2018-10-13 01:02:03 -0400', 'Australia/Sydney','yyyy-MM-dd HH:mm Z')} --> 2018-10-13 16:02 +1100`
	`${_formatDateTz('${ops_launch_time}', '${ops_time_zone}')} = ${_formatDateTz('2018-06-13 15:35:00 -0400', 'Europe/Berlin')} = 2018-06-13 21:35:00 +0200`

Return Day of Week

Description	Returns the day of week for the specified date as a number.
Syntax	**`${_dayOfWeek`**`(['date', 'first_dow', first_dow_value])}`
Parameters	• `date` Optional; Date in format yyyy-MM-dd. Default is the current date. • `first_dow` Optional; Specification for whether the week starts on Sunday or Monday. Values are **sun** and **mon** (not case-sensitive). Default is sun. • `first_dow_value` Optional; Starting value for the first day of week. Value must be a non-negative number. Default is 1.

Example	`${_dayOfWeek} --> 6`
	`${_dayOfWeek()} --> 6`
	`${_dayOfWeek('2012-07-04')} --> 4`
	`${_dayOfWeek('2012-07-04', 'mon')} --> 3`

Return Days between Dates

Description	Returns the number of days between date1 and date2. • If return value is > 0, date2 is after date1. • If return value is < 0, date2 is before date1. • If return value is 0, date1 is equal to date2. The start date is inclusive, but the end date is not.
Syntax	**`${_daysBetween`**`('date1', 'date2')}`
Parameters	• `date1` Required; First date in format yyyy-MM-dd. • `date2` Required; Second date in format yyyy-MM-dd.
Example	`${_daysBetween('2012-08-01','2012-09-01')} --> 31`

Return Non-Business Day of Month

Description	Returns the Nth non-business day of month for the month of the date specified. Optionally, can start from the end of the month. ⚠ Whether a holiday is treated as a business day or a non-business day is specified by the Exclude Holidays for Business Days Universal Controller system property.
Syntax	**`${_nonBusinessDayOfMonth`**`(index, ['date', 'format', reverse])}`
Parameters	• `index` Required; Nth non-business day of month. • `date` Optional; Date in format yyyy-MM-dd. If blank, defaults to the current date. • `format` Optional; Format of returned date. Default is yyyy-MM-dd. For details on the `format` parameter, see http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html • `reverse` Optional; Specification (**true** or **false**) for starting from the end of the month. Default is false.

Examples	`${_nonBusinessDayOfMonth(1)} --> 2012-08-04`
	`${_nonBusinessDayOfMonth(1,'2012-09-01')} --> 2012-09-01`
	`${_nonBusinessDayOfMonth(1,'2012-09-01','',true)} --> 2012-09-30`

Return Nth Business Day of Month

Description	Returns the Nth business day of month for the month of the date specified. Optionally, can start from the end of the month. ⚠ Whether a holiday is treated as a business day or a non-business day is specified by the Exclude Holidays for Business Days Universal Controller system property.
Syntax	**`${_businessDayOfMonth`**`(index, ['date', 'format', reverse])}`
Parameters	• `index` Required; Nth business day of month. • `date` Optional; Date in format yyyy-MM-dd. Default is the current date. • `format` Optional; Format of returned date. Default is yyyy-MM-dd. (For details on the `format parameter`, see http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html • `reverse` Optional; Specification (`true` or `false`) for starting from the end of the month. Default is false.

Examples	`${_businessDayOfMonth(1)} --> 2012-08-01`
	`${_businessDayOfMonth(1,'2012-09-01')} --> 2012-09-04`
	`${_businessDayOfMonth(1,'2012-09-01','',true)} --> 2012-09-28`

Return Nth Day of Month

Description	Returns the Nth day of month for the month of the date specified. Optionally, can start from the end of the month.
Syntax	**`${_dayOfMonth`**`(index, ['date', 'format', reverse])}`

Parameters	• `index` Required; Nth day of month. • `date` Optional; Date in format yyyy-MM-dd. Default is the current date. • `format` Optional; Format of returned date. Default is yyyy-MM-dd. • `reverse` Optional; Specification (**true** or **false**) for starting from the end of the month. Default is false.

Examples	`${_dayOfMonth(5)} --> 2012-08-05`
	`${_dayOfMonth(15,'2012-09-01','MM/dd/yyyy')} --> 09/15/2012`
	`${_dayOfMonth(1,'2012-09-01','',true)} --> 2012-09-30`

Return Number of Business Days between Dates

Description	Returns the number of business days between date1 and date2. • If return value is > 0, `date2` is after `date1`. • If return value is < 0, `date2` is before `date1`. • If return value is 0, `date1` is equal to `date2`. The start date is inclusive, but the end date is not. ⚠ Whether a holiday is treated as a business day or a non-business day is specified by the Exclude Holidays for Business Days Universal Controller system property.
Syntax	**`${_businessDaysBetween`**`('date1', 'date2')}`
Parameters	Parameters: • `date1` Required; First date in format yyyy-MM-dd. • `date2` Required; Second date in format yyyy-MM-dd.
Example	`${_businessDaysBetween('2012-08-01','2012-09-01')} --> 23`

Mathematical Functions

Add

Description	Return the sum of the augend added with the addend.
Syntax	**${_add**(augend, addend)}
Parameters	• augend Integer to which the addend is being added. • addend Integer being added to the augend.
Example	${_add('77', '33')} --> 110 Using Variables for augend and addend (${augend} = 17, ${addend} = 5): ${_add('${augend}','${addend}')} --> 22

Divide

Description	Return the quotient of the dividend divided by divisor.
Syntax	**${_divide**(dividend, divisor)}
Parameters	• dividend Integer being divided by the divisor. • divisor Integer being used to divide the dividend.

Example	`${_divide('7','20')} --> 0`
	`${_divide('20','7')} --> 2`
	`${_divide('20','5')} --> 4`
	
	Using Variables for dividend and divisor (${dividend} = 100, ${divisor} = 5)
	
	`${_divide('${dividend}','${divisor}')} --> 20`

Multiply

Description	Return the product of the multiplicand multiplied with the multiplier.
Syntax	**`${_multiply`**`(multiplicand, multiplier)}`
Parameters	• `multiplicand` Integer being multiplied by the `multiplier`. • `multiplier` Integer being used to multiply the `multiplicand`.

Example	`${_multiply('7','20')} --> 140`
	
	Using Variables for multiplicand and multiplier (${multiplicand} = 100, ${multiplier} = 5):
	
	`${_multiply('${multiplicand}','${multiplier}')} --> 500`

Return Absolute Value

Description	Return the absolute value of the parameter.
Syntax	**`{_abs`**`(parameter)}`

Parameters	• `parameter` Integer (positive or negative value).

Example	`${_abs('-1200')} --> 1200`
	`${_abs('1200')} --> 1200`
	
	Using Variables for parameter (${parameter} = -100):
	
	`${_abs('${parameter}')} --> 100`

Return Modulo

Description	Return the modulo (remainder) of the dividend divided by divisor.
Syntax	**`${_mod`**`(dividend, divisor)}`
Parameters	• `dividend` Integer being divided by the `divisor`. • `divisor` Integer being used to divide the `dividend`.

Example	`${_mod('10', '2')} --> 0`
	`${_mod('10', '3')} --> 1`
	`${_mod('70', '65')} --> 5`
	
	Using Variables for dividend and divisor (${dividend} = 23, ${divisor} = 5):
	
	`${_mod('${dividend}','${divisor}')} --> 3`

Subtract

Description	Return the difference of the subtrahend subtracted from the minuend.
Syntax	**`${_subtract`**`(minuend, subtrahend)}`
Parameters	• `minuend` Integer from which the `subtrahend` is being subtracted. • `subtrahend` Integer being subtracted from the `minuend`.

Example	`${_subtract('77','33')} --> 44`
	`${_subtract('33','77')} --> -44`
	
	Using Variables for minuend and subtrahend (${minuend} = 100, ${subtrahend} = 5):
	
	`${_subtract('${minuend}','${ subtrahend }')} --> 95`

Output Functions

(For Web Service output, see Web Service Functions.)

> **Note**
> A prerequisite for the use of these functions is that Automatic Output Retrieval and Wait For Output are selected at task level.

Task Instance Output

Description	Resolves to the output data, of the specified `outputType`, of the task instance that is resolving the function. • If the output record of the specified `ouptutType` cannot be found, the function will remain unresolved.
Syntax	**`${_output`**`('outputType'[, 'defaultValue'])}`

Parameters	• `outputType` Required; Type of output to resolve: STDOUT, STDERR, FILE, or JOBLOG • `defaultValue` Optional; Default value to return if the output data is not found. Default is empty (').

Sibling Task Instance Output

Description	Resolves to the output data, of the specified `outputType`, of the task instance specified by the `siblingName` parameter. The sibling task instance must be within the same workflow, and the Execution User of the task instance that is resolving the function must have Read permission for the sibling task instance. • If the output record of the specified `outputType` cannot be found, the function will remain unresolved.
Syntax	`${_outputFromTask('siblingName', 'outputType'[, 'defaultValue'])}`
Parameters	• `siblingName` Required; Name of a sibling task instance. • `outputType` Required; Type of output to resolve: STDOUT, STDERR, FILE, or JOBLOG. • `defaultValue` Optional; Default value to return if the output data is not found. Default is empty (').

Task Instance Output by Specific Line(s)

Description	Resolves to the specified line(s) of output data, of the specified `outputType`, of the task instance that is resolving the function. • If the output record of the specified `ouptutType` cannot be found, the function will remain unresolved.
Syntax	`${_outputLines('outputType', startLine, numberOfLines[, 'defaultValue', 'resultDelimiter'])}`
Parameters	• `outputType` Required; Type of output to resolve. • `startLine` Required; Start line, where 1 is the first line and -1 is the last line. • `numberOfLines` Required; Number of lines to return starting from the `startLine`. • `defaultValue` Optional; Default value to return if no lines qualify. Default is empty (') • `resultDelimiter` Optional; Delimiter to use when concatenating matching lines. If not specified, "\n" or "\r\n" depending on original output line endings.

Sibling Task Instance Output by Specific Line(s)

Description	Resolves to the specified line(s) of output data, of the specified `outputType`, of the task instance specified by the `siblingName` parameter. The sibling task instance must be within the same workflow, and the Execution User of the task instance that is resolving the function must have Read permission for the sibling task instance. • If the output record of the specified `outputType` cannot be found, the function will remain unresolved.
Syntax	**`${_outputLinesFromTask`**`('siblingName', 'outputType', startLine, numberOfLines[, 'defaultValue', 'resultDelimiter'])}`
Parameters	• `siblingName` Required; Name of a sibling task instance. • `outputType` Required; Type of output to resolve. • `startLine` Required; Start line, where 1 is the first line and -1 is the last line. • `numberOfLines` Required; Number of lines to return starting from the `startLine`. • `defaultValue` Optional; Default value to return if no lines qualify. Default is empty (''). • `resultDelimiter` Optional; Delimiter to use when concatenating matching lines. If not specified, "\n" or "\r\n" depending on original output line endings.

Task Instance Output by Line(s) Matching Regular Expression

Description	Resolves to the line(s) of output data that match the specified regular expression, of the specified `outputType`, of the task instance that is resolving the function by specifying a regular expression. • The complete outpout line is returned. • If the output record of the specified `ouptutType` cannot be found, the function will remain unresolved.
Syntax	**`${_outputLinesByRegex`**`('outputType', 'regexPattern'[, maxCount, numberOfLinesBefore, numberOfLinesAfter, 'defaultValue', 'resultDelimiter'])}`

Parameters	• `outputType`
	Required; Type of output to resolve. Valid `outputType` values are:
	  • STDOUT
	  • STDERR
	  • FILE
	  • JOBLOG
	• `regexPattern`
	Required; Regular expression used for determining if a line matches. Regular expression must match the whole line (see Example, below).
	• `maxCount`
	Optional; Maximum number of matching lines to return. Default is 1.
	• `numberOfLinesBefore`
	Optional; Number of lines before each matching line to return along with the matching line. Default is 0.
	• `numberOfLinesAfter`
	Optional; Number of lines after each matching line to return along with the matching line. Default is 0.
	• `defaultValue`
	Optional; Default value to return if no lines match the regular expression. Default is empty (').
	• `resultDelimiter`
	Optional; Delimiter to use when concatenating matching lines. If not specified, "\n" or "\r\n" depending on original output line endings.

Example	STDOUT contains: *Some_Text* *ABC=Some_String* *More_Text* ${_outputLinesByRegex('STDOUT', '^ABC=')} Returns empty (the whole Line was not matched) ${_outputLinesByRegex('STDOUT', '^ABC=.*')} Returns ABC=Some_String

Sibling Task Instance Output by Line(s) Matching Regular Expression

Description	Resolves to the line(s) of output data that match the specified regular expression, of the specified `outputType`, of the task instance specified by the `siblingName` parameter. The sibling task instance must be within the same workflow, and the Execution User of the task instance that is resolving the function must have Read permission for the sibling task instance. • If the output record of the specified `outputType` cannot be found, the function will remain unresolved.
Syntax	**`${_outputLinesByRegexFromTask`**`('siblingName', 'outputType', 'regexPattern'[, maxCount, numberOfLinesBefore, numberOfLinesAfter, 'defaultValue', 'resultDelimiter'])}`

Parameters	• `siblingName` Required; Name of a sibling task instance. • `outputType` Required; Type of output to resolve. • `regexPattern` Required; Regular expression used for determining if a line matches. • `maxCount` Optional; Maximum number of matching lines to return. Default is 1. • `numberOfLinesBefore` Optional; Number of lines before each matching line to return along with the matching line. Default is 0. • `numberOfLinesAfter` Optional; Number of lines after each matching line to return along with the matching line. Default is 0. • `defaultValue` Optional; Default value to return if no lines match the regular expression. Default is empty ('). • `resultDelimiter` Optional; Delimiter to use when concatenating matching lines. If not specified, "\n" or "\r\n" depending on original output line endings.

Script Functions

Returns Path to Data Script

Description	Returns a token representing the path to a Data Script that you want to embed.
Syntax	**`${_scriptPath`**`('script_name')`**`}`**
Parameters	• `script_name` Required; Name of the Data Script.
Example	`${_scriptPath('myscriptdata')}`

Note
`_scriptPath` requires Agent 6.4.0.0 or later.

SQL/Stored Procedure Functions

Return Column Names for SQL Results from Current Task

Description	Returns the column names for the SQL results from the current SQL or Stored Procedure task. Column names are separated by the specified `separator`.
Syntax	**`${_resultsColumnNames`**`(['separator'])}`
Parameters	• `separator` Optional; Column name separator. Default is comma (,).

Return Column Names for SQL Results from Sibling Task

Description	Returns the column names for the SQL results from a sibling SQL or Stored Procedure task, within the same workflow. Column names are separated by the specified `separator`.
Syntax	**`${_resultsColumnNamesFromTask`**`('name'[, 'separator'])}`
Parameters	• `name` Required; Name of the sibling task that the results should come from. The task must be within the same workflow. • `separator` Optional; Column name separator. Default is comma (,).

Return SQL Results from Current Task

Description	Returns all SQL results from the current SQL or Stored Procedure task. Columns are separated by the specified `separator` and rows are separated by a new line.
Syntax	**`${_resultsAll`**`(['separator', 'rowSeparator'])}`
Parameters	• `separator` Optional; Column separator. Default is comma (,). • `rowSeparator` Optional; Overrides default New Line character.

Return SQL Results from Sibling Task

Description	Returns all SQL results from a sibling SQL or Stored Procedure task, within the same workflow. Columns are separated by the specified `separator` and rows are separated by a new line.
Syntax	**`${_resultsAllFromTask`**`('name'[, 'separator', 'rowSeparator'])}`

Parameters	• `name` Required; Name of the task that the results should come from. The task must be within the same workflow. • `separator` Optional; Column separator. Default is comma (,). • `rowSeparator` Optional; Overrides default New Line character.

Return SQL Warnings from Current Task

Description	Returns all SQL warnings from the current SQL or Stored Procedure task. Columns are separated by the specified `separator` and rows are separated by a new line.
Syntax	**`${_SQLWarnings`**`(['separator'])}`
Parameters	• `separator` Optional; Column separator. Default is comma (,).

Return SQL Warnings from Sibling Task

Description	Returns all SQL warnings from a sibling SQL or Stored Procedure task, within the same workflow. Columns are separated by the specified `separator` and rows are separated by a new line.
Syntax	**`${_SQLWarningsFromTask`**`('name'[, 'separator'])}`
Parameters	• `name` Required; Name of the sibling task that the warnings should come from. The task must be within the same workflow. • `separator` Optional; Column separator. Default is comma (,).

Return String Value of Row/Column by Column Name

Description	Returns the string value of a row/column from a previously executed SQL task within the same workflow, or from the current SQL task.
Syntax	**`${_resultsColumn`**`('name', 'colname'[, rownum, 'default_value'])}`

Parameters	• `name` Required; Name of a sibling SQL task within the same workflow from which you want the function to fetch results. If you want to execute the function against the current task, use an empty string for the name parameter. • `colname` Required; Name of column to retrieve. • `rownum` Optional; Numeric row number in result set to retrieve. Default is 1. • `default_value` Optional; Default value to return if result not found.

Return String Value of Row/Column by Column Number

Description	Returns the string value of a row/column from a previously executed SQL task within the same workflow, or from the current SQL task.
Syntax	**`${_resultsColumnByNo`**`('name', colnum[, rownum, 'default_value'])}`
Parameters	• `name` Required; Name of a sibling SQL task within the same workflow from which you want the function to fetch results. If you want to execute the function against the current task, use an empty string for the name parameter. • `colnum` Required; Number of column to retrieve. First column in result is 1, second is 2, and so on. • `rownum` Optional; Numeric row number in result set to retrieve. Default is 1. • `default_value` Optional; Default value to return if result not found.

Return String Values of Columns

Description	Returns the string values of columns in a specific row in CSV (comma-separated values) format, from a previously executed SQL task within the same workflow, or from the current SQL task.
Syntax	**`${_resultsColumnsCSV`**`('name'[, rownum])}`
Parameters	• `name` Required; Name of a sibling SQL task within the same workflow from which you want the function to fetch results. If you want to execute the function against the current task, use an empty string for the `name` parameter. • `rownum` Optional; Numeric row number in result set to retrieve. Default is 1.

String Functions

String Functions can accept:

- String content in a String parameter.
- Variable name in a String parameter (prefixed with _var) from which string content can be obtained.
- Integer and Boolean parameters.

For String functions that accept a String value parameter directly, the value parameter can be specified using hard-coded text, variables, functions, or any combination of the three.

Note
When using String functions that accept a String value parameter directly, you should be aware of expectations with respect to escape characters and escape sequences (see Escape Sequences, below).

For String functions that accept a variable name parameter, the fully resolved value of the variable by the specified name will be used as the String value argument. The variable must be fully resolvable and must not contain an unresolved function.

Note
Indexing functions use zero-based numbering; that is, the initial element is assigned the index 0.

Escape Sequences

An escape character preceded by a backslash (\) is an escape sequence (see the following table for a list of escape sequences).

If you are using a String function to manipulate a String value that potentially may contain an escape sequence, you should use the String function that accepts a variable name parameter to allow for passing the value to the function without the escape sequence being interpreted.

Escape Sequences	Escape Sequence Description
\t	Insert a tab in the text at this point.
\b	Insert a backspace in the text at this point.
\n	Insert a newline in the text at this point.
\r	Insert a carriage return in the text at this point.
\f	Insert a formfeed in the text at this point.
\'	Insert a single quote character in the text at this point.
\"	Insert a double quote character in the text at this point.
\\	Insert a backslash character in the text at this point.

Convert Characters in Value to Lower Case

Description	Converts all of the characters in the `value` to lower case using the rules of the default locale.
Syntax	**`${_toLowerCase`**`('value')}`
Parameters	• `value` Required; String to convert to lower case.

Convert Characters in Variable to Lower Case

Description	Converts all of the characters in the variable to lower case using the rules of the default locale.
Syntax	**`${_varToLowerCase`**`('variableName')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function.

Convert Characters in Value to Upper Case

Description	Converts all of the characters in the `value` to upper case using the rules of the default locale.
Syntax	**`${_toUpperCase`**`('value')}`
Parameters	• `value` Required; String to convert to upper case.

Convert Characters in Variable to Upper Case

Description	Converts all of the characters in the variable to upper case using the rules of the default locale.
Syntax	**`${_varToUpperCase`**`('variableName')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function.

Escape Characters in Variable Using XML Entities

Description	Escapes the characters in a variable value using XML entities.
Syntax	**`${_varEscapeXml`**`('variableName')}`

Parameters	• `variableName` Required; Name of the variable being passed into the function. The variable value will be escaped for insertion into XML.
Example	Variable Name: escape_me Variable Value: `1234567890\E-=[]\;',./ ~!@#$%^&*()_+{}\|:"<>?  `${_varEscapeXml('escape_me')} --> `1234567890\E-=[]\;',./ ~!@#$%^&*()_+{}|:"<>?`

Escape Characters in Variable Using JSON String Rules

Description	Escapes the characters in a variable value using JSON string values.
Syntax	**`${_varEscapeJson`**`('variableName')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. The variable value will be escaped for insertion into JSON.
Example	Variable Name: escape_me Variable Value: `1234567890\E-=[]\;',./ ~!@#$%^&*()_+{}\|:"<>?  `${_varEscapeJson('escape_me')} --> `1234567890\\E-=[]\\;',.\/ ~!@#$%^&*()_+{}|:\"<>?`

Escape Characters in Variable Using JavaScript String Rules

Description	Escapes the characters in a variable value using JavaScript String rules.
Syntax	**`${_varEscapeJavaScript`**`('variableName')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. The variable value will be escaped for insertion into JavaScript.

Example	Variable Name: escape_me Variable Value: `1234567890\E-=[]\;',./ ~!@#$%^&*()_+{}\|:"<>?  `${_varEscapeJavaScript('escape_me')} --> `1234567890\\E-=[]\\;\',.\/ ~!@#$%^&*()_+{}|:\"<>?`

Escape Characters in Variable Using HTML Entities

Description	Escapes the characters in a variable value using HTML entities. (Supports all known HTML 4.0 entities.)
Syntax	**`${_varEscapeHtml`**`('variableName')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. The variable value will be escaped for insertion into HTML.
Example	Variable Name: escape_me Variable Value: `1234567890\E-=[]\;',./ ~!@#$%^&*()_+{}\|:"<>?  `${_varEscapeHtml('escape_me')} --> `1234567890\E-=[]\;',./ ~!@#$%^&*()_+{}|:"<>?`

Escape Characters in Variable as a Literal Pattern

Description	Returns a literal regular expression pattern String for the value of the specified variable. This method produces a String that can be used to create a Pattern that would match the String as if it were a literal pattern.
Syntax	**`${_varLiteralPattern`**`('variableName')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. The variable value will be escaped for insertion into a regular expression as a literal pattern.

Example	Variable Name: escape_me Variable Value: `1234567890\E-=[]\;',./ ~!@#$%^&*()_+{}\|:"<>?  `${_varLiteralPattern('escape_me')} --> \Q`1234567890\E\\E\Q-=[]\;',./ ~!@#$%^&*()_+{}|:"<>?\E`

Randomly Generate a String

Description	Randomly generates a String with a specified length.
Syntax	**`${_randomString`**`(length[, 'excludeCharacters', 'defaultCharacters'])}`
Parameters	• `length` Required; String length. • `excludeCharacter` Optional; String containing characters to exclude from the default character set. • `defaultCharacter` Optional; String for overriding default character set. **Note** The following characters are included in the default character set, in addition to the space character. ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz1234567890`-=~!@#$%^&*()_+[]\{}|;':",./<>?
Example	`${_randomString(24, '', 'ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890@#$%*')} --> 5*L8T1RN#$AQWEKPA@BQ19JD`

Replace Substring of Value with Regular Expression

Description	Replaces each substring of value that matches the specified regular expression, regex, with the specified replacement.
Syntax	**`${_replaceAll`**`('value', 'regex', 'replacement')}`

Parameters	• `value` Required; Input string. • `regex` Required; Regular expression. • `replacement` Required; Replacement string.

Replace Substring of Variable with Regular Expression

Description	Replaces each substring of `variableName` that matches the specified regular expression, regex, with the specified replacement.
Syntax	**`${_varReplaceAll`**`('variableName', 'regex', 'replacement')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. • `regex` Required; Regular expression. • `replacement` Required; Replacement string.

Return Copy of Value with Whitespace Omitted

Description	Returns a copy of `value`, with leading and trailing whitespace omitted.
Syntax	**`${_trim`**`('value')}`
Parameters	• `value` Required; String to trim.

Return Copy of Variable with Whitespace Omitted

Description	Returns a copy of `variableName`, with leading and trailing whitespace omitted.
Syntax	**`${_varTrim`**`('variableName')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function.

Return Index of Substring in String Value

Description	Returns the index within the string value of the first occurrence of the specified substring, `str`.
Syntax	**`${_indexOf`**`('value', 'str')}`
Parameters	• `value` Any string. • `str` Substring to search for. If the `str` argument occurs as a substring within the value, then the index of the first character of the first such substring is returned; if it does not occur as a substring, -1 is returned.

Return Index of Substring in String Variable

Description	Returns the index within the string variable of the first occurrence of the specified substring, `str`.
Syntax	**`${_varIndexOf`**`('variableName', 'str')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. • `str` Required; Substring to search for. If the `str` argument occurs as a substring within the variable, the index of the first character of the first such substring is returned; if it does not occur as a substring, -1 is returned.

Return Index of Substring Plus Offset in String Value

Description	Returns the index within this string of the first occurrence of the specified substring plus the specified offset. The integer returned is the smallest value.
Syntax	**`${_indexOfWithOffset`**`('value', 'str', offset)}`
Parameters	• `value` Required; Any string. • `str` Required; Substring to search for. If the `str` argument occurs as a substring within the value, then the index of the first character of the first such substring is returned; if it does not occur as a substring, -1 is returned. • `offset` Required; Number (positive or negative) to offset the found index.

Return Index of Substring Plus Offset in String Variable

Description	Returns the index within this string of the first occurrence of the specified substring plus the specified offset. The integer returned is the smallest variable.
Syntax	**`${_varIndexOfWithOffset`**`('variableName', 'str', offset)}`

Parameters	• `variableName` Required; Name of the variable being passed into the function. • `str` Required; Substring to search for. If the `str` argument occurs as a substring within the variable, then the index of the first character of the first such substring is returned; if it does not occur as a substring, -1 is returned. • `offset` Required; Number (positive or negative) to offset the found index.

Return Index of Rightmost Occurrence of Substring in String Value

Description	Returns the index within the string value of the rightmost occurrence of the specified substring, `str`.
Syntax	**`${_lastIndexOf`**`('value', 'str')}`
Parameters	• `value` Required; Any string. • `str` Required; Substring to search for. If the `str` argument occurs one or more times as a substring within the value, then the index of the first character of the last such substring is returned. If it does not occur as a substring, -1 is returned.

Return Index of Rightmost Occurrence of Substring in String Variable

Description	Returns the index within the string variable of the rightmost occurrence of the specified substring, `str`.
Syntax	**`${_varLastIndexOf`**`('variableName', 'str')}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. • `str` Required; Substring to search for. If the `str` argument occurs one or more times as a substring within the variable, then the index of the first character of the last such substring is returned. If it does not occur as a substring, -1 is returned.

Return Index of Rightmost Occurrence of Substring Plus Offset in String Value

Description	Returns the index within this string of the rightmost occurrence of the specified substring, plus the specified offset. The returned index is the largest value.
Syntax	**`${_lastIndexOfWithOffset`**`('value', 'str', offset)}`

Parameters	• `value` Required; Any string. • `str` Required; Substring to search for. If the `str` argument occurs as a substring within the value, then the index of the first character of the first such substring is returned; if it does not occur as a substring, -1 is returned. • `offset` Required; Number (positive or negative) to offset the found index.

Return Index of Rightmost Occurrence of Substring Plus Offset in String Variable

Description	Returns the index within this string of the rightmost occurrence of the specified substring, plus the specified offset. The returned index is the largest variable.
Syntax	**`${_varLastIndexOfWithOffset`**`('variableName', 'str', offset)}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. • `str` Required; Substring to search for. If the `str` argument occurs as a substring within the variable, then the index of the first character of the first such substring is returned; if it does not occur as a substring, -1 is returned. • `offset` Required; Number (positive or negative) to offset the found index.

Return Length of Value

Description	Returns the length of `value`.
Syntax	**`${_length`**`('value')}`
Parameters	• `value` Required; Any string.

Return Length of Variable

Description	Returns the length of `variableName`.
Syntax	**`${_varLength`**`('variableName'[, useEmptyForUndefined])}`

Parameters	• `variableName`
	Required; Name of the variable being passed into the function.
	• `useEmptyForUndefined`
	Optional; Specification (**true** or **false**) for the handling of a missing variable name. Default is false.
	  • If `useEmptyForUndefined` = **true**, the function will return 0.
	  • If `useEmptyForUndefined` = **false**, the function will remain unresolved if the variable name does not exist.

Return New String that is Substring of Value

Description	Returns a new string that is a substring of `value`. The substring begins at `beginIndex` and extends to the character at `endIndex` -1.
Syntax	**`${_substring`**`('value', beginIndex[, endIndex])}`
Parameters	• `value` Required; String to make a substring from. • `beginIndex` Required; Beginning index, inclusive. • `endIndex` Optional; Ending index, exclusive.
Example	`${_substring('hamburger', 4, 8)} --> urge` `${_substring('smiles', 1, 5)} --> mile`

Return New String that is Substring of Variable

Description	Returns a new string that is a substring of `variableName`. The substring begins at `beginIndex` and extends to the character at `endIndex` -1.
Syntax	**`${_varSubstring`**`('variableName', beginIndex[, endIndex])}`
Parameters	• `variableName` Required; Name of the variable being passed into the function. • `beginIndex` Required; Beginning index, inclusive. • `endIndex` Optional; Ending index, exclusive.

Examples	If the value of the `food` variable is **hamburger**, and the value of the `face` variable is **smiles**:
	
	`${_varSubstring('food', 4, 8)} --> urge`
	`${_varSubstring('face', 1, 5)} --> mile`

System Functions

Display Variables

Description	Displays all the defined and built-in variables associated with the task instance.
Syntax	**`${_scope}`**
Parameters	(none)
Example	`${_scope} --> {ops_workflow_id=, ops_task_type=Unix, ops_status=DEFINED, ops_retry_interval=60, ops_exit_code=0, ops_retry_maximum=0, ops_cmd_parms=, ops_cmd=ls -la; exit ${_random('9')};, ops_retry_count=0, ops_agent_id=67e4994143d2617201cdf4ba9df9ab0a, ops_task_id=84880af243d26172019aa1d25988a8f9, ops_task_name=Opswise - Linux Ls}`

Generate Random Number

Description	Generates a random number between `max` (inclusive) and `min` (inclusive)
Syntax	**`${_random`**`([max, min])}`
Parameters	• `max` Optional; Upper bound (inclusive) on the random number. Default is 9. • `min` Optional; Lower bound (inclusive) on the random number. Default is 0.

Resolve to GUID (Globally Unique ID)

Description	Resolves to a 32-byte GUID (Globally Unique ID).

Syntax	**${_guid}**
Parameters	(none)

Resolve to Host Name

Description	Resolves to the hostname of the machine running the Controller, if available.
Syntax	**${_hostname}**
Parameters	(none)

Resolve to IP Address

Description	Resolves to the IP address of the machine running the Controller.
Syntax	**${_ipaddress}**
Parameters	(none)

Resolve to SYS_ID

Description	Resolves to the sys_id of the first task instance found within the same workflow specified by the sibling name.
Syntax	**${_siblingid**('sibling_name')}
Parameters	• sibling_name Required; Sibling name.
Example	${_siblingid('Timer 60')} --> 5dbaaab943d26172015e10ab3e894e10

Resolve to Variable Value

Description	Locates the specified variable in the specified sibling task instance within the same workflow and resolves to the variable value.
Syntax	**${_varLookup**('sibling_name', 'variable_name'[,'def'])}

Parameters	• `sibling_name` Required; Name of the sibling task instance from which the function is collecting the variable value. • `variable_name` Required; Name of the variable being collected by the function. • `def` Optional; Default value to return if the variable is not defined in the sibling task instance.

Resolve Variable

Description	Resolves the variable specified by the `variable_name` parameter and substitutes the `default_value` if the variable cannot be resolved.
Syntax	**`${_resolve`**`('variable_name', 'default_value')}`
Parameters	• `variable_name` Required; Variable name. • `default_value` Required; Default value to use if the variable cannot be resolved.

Resolve Variable (Advanced)

Description	Resolves the variable specified by the `variable_name` parameter and substitutes the default value if the variable cannot be resolved.
Syntax	**`${_resolveadv`**`('variable_name', 'default_value', [use_default_if_blank])}`
Parameters	• `variable_name` Required; Variable name. • `default_value` Required; Default value to use if the variable cannot be resolved. • `use_default_if_blank` Optional; Specification (**true** or **false**) for whether or not to use the default value if the variable is empty or blank. (If `use_default_if_blank` is false, `_resolveadv` behaves like _resolve.)

Universal Task Functions

Convert Array Field Variable

Description	
Syntax	**`${_convertArrayFieldVariable`**`('arrayFieldVariableName'[,'delimiter', 'separator', 'keyQuote', 'valueQuote'])}`

Parameters

- `arrayFieldVariableName`
  Required; Name of the variable for the Array Field; for example, ***ops_af_p2***.
- delimeter
  Optional; Value to be used to delimit the Name from the Value. Default is **=**.
- separator
  Optional; Value to be used to separate one entry/row from the next. Default is comma (**,**).
- keyQuote
  Optional; Quoting to be used around the Name. Default is "no quoting."
- valueQuote
  Optional; Quoting to be used around the Value. Default is "no quoting."

Example

```
convertArrayFieldVariable(String arrayFieldVariableName, String delimiter, String separator, String keyQuote, String valueQuote)
================================================================================================================================

${_convertArrayFieldVariable('ops_af_p1')}
P1A=5,P1B=42
---------------

${_convertArrayFieldVariable('ops_af_p1', '=')}
P1A=5,P1B=42
---------------

${_convertArrayFieldVariable('ops_af_p1', ':')}
P1A:5,P1B:42
---------------

${_convertArrayFieldVariable('ops_af_p1', ':', ';')}
P1A:5;P1B:42
---------------

${_convertArrayFieldVariable('ops_af_p1', '::', ',', '\'')}
'P1A'::5,'P1B'::42
---------------

${_convertArrayFieldVariable('ops_af_p1', '=', ',', '\'', '"')}
'P1A'="5",'P1B'="42"
---------------

${_convertArrayFieldVariable('ops_af_p1', "", "", '\'', '\'')}
'P1A'='5','P1B'='42'
---------------

${_convertArrayFieldVariable('ops_af_p1', ':', '\\n', '\'', '\'')}
'P1A':'5'
'P1B':'42'
---------------

${_convertArrayFieldVariable('ops_af_p2')}
P2A=Red,P2B=White,P2C=Blue
---------------

${_convertArrayFieldVariable('ops_af_p2', '=')}
P2A=Red,P2B=White,P2C=Blue
---------------
```

```
${_convertArrayFieldVariable('ops_af_p2', ':')}
P2A:Red,P2B:White,P2C:Blue
---------------

${_convertArrayFieldVariable('ops_af_p2', ':', ';')}
P2A:Red;P2B:White;P2C:Blue
---------------

${_convertArrayFieldVariable('ops_af_p2', '::', ',', '\'')}
'P2A'::Red,'P2B'::White,'P2C'::Blue
---------------

${_convertArrayFieldVariable('ops_af_p2', '=', ',', '\'', '"')}
'P2A'="Red","P2B"="White","P2C"="Blue"
---------------

${_convertArrayFieldVariable('ops_af_p2', '', '', '\'', '\'')}
'P2A'='Red','P2B'='White','P2C'='Blue'
---------------

${_convertArrayFieldVariable('ops_af_p2', ':', '\\n', '\'', '\'')}
'P2A':'Red'
'P2B':'White'
```

```
'P2C':'Blue'
---------------
```

Get Array Field Variable Value

Description	
Syntax	**`${_getArrayFieldVariableValue`**`('arrayFieldVariableName', 'name')}`
Parameters	• `arrayFieldVariableName` Required; Name of the variable for the Array Field; for example, ***ops_af_p1***. • `name` Required; Name of the entry for which the value is to be returned.

Example

```
ops_af_p1
----------
P1A=5
P1B=42
----------

ops_af_p2
----------
P2A=Red
P2B=White
P2C=Blue
----------

getArrayFieldVariableValue(String arrayFieldVariableName, String name)
=======================================================

P1A = ${_getArrayFieldVariableValue('ops_af_p1', 'P1A')}
----------
P1A=5
----------

P1B = ${_getArrayFieldVariableValue('ops_af_p1', 'P1B')}
----------
P1B=42
----------

P2A = ${_getArrayFieldVariableValue('ops_af_p2', 'P2A')}
----------
P2A=Red
----------

P2B = ${_getArrayFieldVariableValue('ops_af_p2', 'P2B')}
----------
P2B=White
----------

P2C = ${_getArrayFieldVariableValue('ops_af_p2', 'P2C')}
----------
P2C=Blue
----------
```

Web Service Functions

All functions will remain unresolved if no Web Service output record can be found for the task instance, for the current attempt.

All functions will remain unresolved if a required parameter either is not specified or specified incorrectly.

Raw Output from Web Service Task

Description	Resolves to the raw output data of the Web Service task instance that is resolving the function. • If the output record cannot be found, the function will remain unresolved. • If the output record is found, but the path expression does not yield a result, the function will resolve to the default value.
Syntax	**${_responseRaw**(['default_value'])}
Parameters	• default_value Optional; Default value to return if the result is not found. Default is empty ('').

Raw Output from Sibling Web Service Task

Description	Resolves to the raw output data of the Web Service task instance specified by the siblingName parameter. The sibling task instance must be within the same workflow, and the Execution User of the task instance that is resolving the function must have Read permission for the sibling task instance. • If the output record cannot be found, the function will remain unresolved. • If the output record is found but the path expression does not yield a result, the function will resolve to the default value.
Syntax	**${_responseRawFromTask**('siblingName'[,'defaultValue'])}
Parameters	• siblingName Required; Name of a sibling task instance. • default_value Optional; Default value to return if the result is not found. Default is empty ('').

XML Output Data from Web Service Task

Description	Resolves to the XML output data of the Web Service task instance that is resolving the function, corresponding to the evaluated xPath expression. • If the output record cannot be found, the function will remain unresolved. • If the output record is found, but the path expression does not yield a result, the function will resolve to the default value.
Syntax	**${_responseXPath**('xPathExpression'[,'defaultValue','delimiter',prettyPrint])}

Parameters	• `xPathExpression` Required; xPath expression. • `defaultValue` Optional; Default value to return if the result is not found. Default is empty (''). • `delimiter` Optional; If `xPathExpression` evaluates to multiple results, the delimiter to be used to separate those results. Default is new line character (\n). • `prettyPrint` Optional; Specification (**true** or **false**) for whether or not XML output will be pretty printed (indented). Default is false.

Examples	If you want to obtain the `info` element text from the following Web Service Task XML output, you could use either of two examples for this Function.
	
	`<?xml version="1.0" encoding="UTF-8" standalone="yes"?>`
	`<command-response>`
	`<type>set_variable</type>`
	`<success>true</success>`
	`<info>No changes detected for variable variableName, ignoring Set Variable command.</info>`
	`<errors></errors>`
	`</command-response>`
	
	Example 1
	
	`${_responseXPath('//info')}`
	
	Select the info node in the document no matter where it is.
	
	Example 2
	
	`${_responseXPath('/command-response/info')}`
	
	Select the info node from a specific path in the document, starting from the root node.
	
	Using either of these examples will resolve to the following: No changes detected for variable `variableName`, ignoring Set Variable command.

XML Output Data From Sibling Web Service Task

Description	Resolves to the XML output data of the Web Service task instance specified by the siblingName, corresponding to the evaluated xPath expression. The sibling task instance must be within the same workflow and the Execution User of the task instance that is resolving the function must have Read permission for the sibling task instance. • If the output record cannot be found, the function will remain unresolved. • If the output record is found but the path expression does not yield a result, the function will resolve to the default value.
Syntax	**`${_responseXPathFromTask`**`('siblingName','xPathExpression'[,'defaultValue','delimiter',prettyPrint])}`
Parameters	• `siblingName` Required; Name of a sibling task instance. • `xPathExpression` Required; xPath expression. • `defaultValue` Optional; Default value to return if the result is not found. Default is empty (''). • `delimiter` Optional; If `xPathExpression` evaluates to multiple results, the delimiter to be used to separate those results. Default is new line character (\n). • `prettyPrint` Optional; Specification (**true** or **false**) for whether or not XML output will be pretty printed (indented). Default is false.

JSON Output Data From Web Service Task

Description	Resolves to the JSON output data of the Web Service task instance that is resolving the function, corresponding to the evaluated JSONPath expression. • If the output record cannot be found, the function will remain unresolved. • If the output record is found but the path expression does not yield a result, the function will resolve to the default value.
Syntax	**`${_responseJsonPath`**`('pathExpression'[,'defaultValue','delimiter',prettyPrint])}`
Parameters	• `pathExpression` Required; jsonPath expression. • `defaultValue` Optional; Default value to return if the result is not found. Default is empty (''). • `delimiter` Optional; If `pathExpression` evaluates to multiple results, the delimiter to be used to separate those results. Default is new line character (\n). • `prettyPrint` Optional; Specification (**true** or **false**) for whether or not JSON output will be pretty printed (indented). Default is false.

JSON Output Data From Sibling Web Service Task

Description	Resolves to the JSON output data of the Web Service task instance specified by the siblingName, corresponding to the evaluated JSONPath expression. The sibling task instance must be within the same workflow and the Execution User of the task instance that is resolving the function must have Read permission for the sibling task instance. • If the output record cannot be found, the function will remain unresolved. • If the output record is found but the path expression does not yield a result, the function will resolve to the default value.
Syntax	**`${_responseJsonPathFromTask`**`('siblingName','pathExpression'[,'defaultValue','delimiter',prettyPrint])}`
Parameters	• `siblingName` Required; Name of a sibling task instance. • `pathExpression` Required; jsonPath expression. • `defaultValue` Optional; Default value to return if the result is not found. Default is empty ('). • `delimiter` Optional; If `pathExpression` evaluates to multiple results, the delimiter to be used to separate those results. Default is new line character (\n). • `prettyPrint` Optional; Specification (**true** or **false**) for whether or not JSON output will be pretty printed (indented). Default is false.

JSON Output Data As Array From Web Service Task

Description	Resolves to the JSON output data of the Web Service task instance that is resolving the function, corresponding to the evaluated JSONArray expression. • If the output record cannot be found, the function will remain unresolved. • If the output record is found but the path expression does not yield a result, the function will resolve to the default value.
Syntax	**`${_responseJsonPathAsArray`**`('pathExpression'[,'defaultValue',prettyPrint])}`
Parameters	• `pathExpression` Required; jsonPath expression. • `defaultValue` Optional; Default value to return if the result is not found. Default is empty ('). • `prettyPrint` Optional; Specification (**true** or **false**) for whether or not JSON output will be pretty printed (indented). Default is false.

JSON Output Data As Array From Sibling Web Service Task

Description	Resolves to the JSON output data of the Web Service task instance specified by the siblingName, corresponding to the evaluated JSONArray expression. The sibling task instance must be within the same workflow and the Execution User of the task instance that is resolving the function must have Read permission for the sibling task instance. • If the output record cannot be found, the function will remain unresolved. • If the output record is found but the path expression doesn't yield a result, the function will resolve to the default value.
Syntax	**`${_responseJsonPathAsArrayFromTask`**`('siblingName','pathExpression'[,'defaultValue',prettyPrint])}`
Parameters	• `siblingName` Required; Name of a sibling task instance. • `pathExpression` Required; jsonPath expression. • `defaultValue` Optional; Default value to return if the result is not found. Default is empty ('''). • `prettyPrint` Optional; Specification (**true** or **false**) for whether or not JSON output will be pretty printed (indented). Default is false.