



## **Universal Controller 6.3.x**

### **Variables and Functions**

© 2016 by Stonebranch, Inc. All Rights Reserved.

1. Variables and Functions	3
1.1 Variables and Functions Overview	4
1.2 User-Defined Variables	5
1.3 Built-In Variables	12
1.4 Launching With Variables	33
1.5 Trigger With Variables	34
1.6 Creating a Set Variable Action within a Task or Workflow	35
1.7 Listing and Setting Variables from the Command Line	39
1.8 Functions	40

# Variables and Functions



## Variables

[Overview](#)

[User-Defined Variables](#)



## Using Variables

[Setting Variables under Special Circumstances](#)

[Launching With Variables](#)

[Triggering with Variables](#)

[Creating a Set Variable Action within a Task or Workflow](#)

[Listing and Setting Variables from the Command Line](#)



## Functions

[Overview](#)

[Date Functions](#)

[Mathematical Functions](#)

[SQL/Stored Procedure Functions](#)

[String Functions](#)

[System Functions](#)



The information on these pages also is located in the [Universal Controller 6.3.x Variables and Functions.pdf](#).



## Built-In Variables

[Overview](#)

[Agent Variables](#)

[Agent-Based Task Insta](#)

[Application Monitor Trig](#)

[Cluster Node Variables](#)

[File Monitor Task Instan](#)

[File Transfer Task Insta](#)

[FTP File Monitor Task Ir](#)

[OMS Server Variables](#)

[SAP Task Instance Vari](#)

[SQL and Stored Proced](#)

[System Monitor Task In](#)

[Task Instances Variable](#)

[Task Monitor Task Insta](#)

[Trigger Variables \(all tri](#)

[Trigger Variables for Co](#)

[z/OS Task Instance Vari](#)

# Variables and Functions Overview

- [Variables and Functions](#)
- [Types of Variables](#)
- [Setting Variables under Special Circumstances](#)

## 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:

<a href="#">User-Defined Variables</a>	<p>These variables are created by the user for use within:</p> <ul style="list-style-type: none"> <li>• A single trigger, task, or workflow (that is a <a href="#">trigger-</a>, <a href="#">task-</a>, or <a href="#">workflow-specific</a> variable ).</li> <li>• All trigger, tasks, and workflows (that is, a <a href="#">Global</a> variable).</li> </ul>
<a href="#">Built-In Variables</a>	<p>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.</p>
<a href="#">Functions</a>	<p>These variables calculate some value, such as current date and time, or perform some function, such as <a href="#">_replaceAll</a>.</p>

## 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
- Variable Naming Conventions
- Resolving User-Defined Variables
  - For Tasks Launched by a Trigger
  - For Tasks Launched by a Workflow
  - For Tasks Launched Manually
- Format for Using Variables
- Creating a Variable
- Creating a Global Variable
  - Global Variable Details
  - Global Variable Details Field Descriptions
- Creating a Variable Specific to a Trigger, Task, or Workflow
- Automatically Incrementing a Variable

### 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](#)
- Available to all triggers, tasks, and workflows; that is, [Global](#).

You define variables specific to single a 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 by either:

- 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 alphanumeric (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

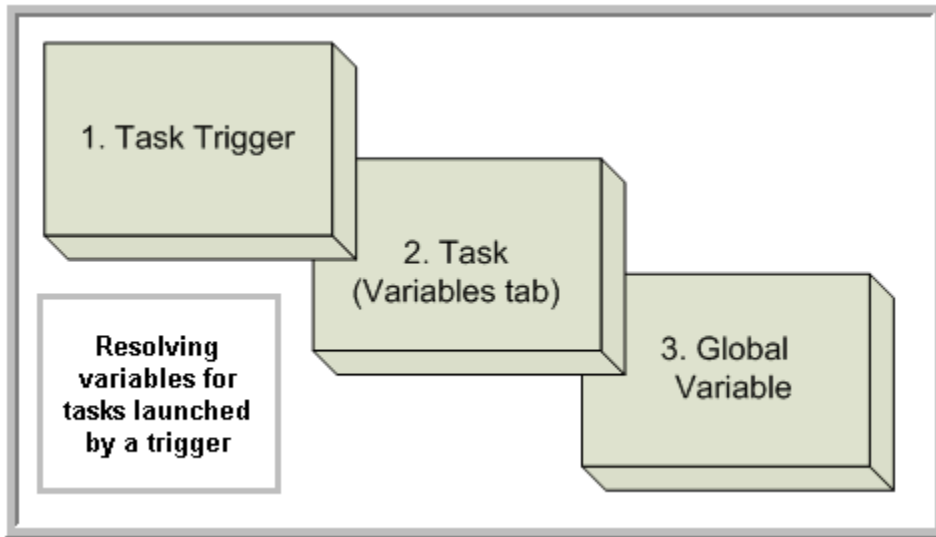
When the Controller creates a task instance from a task, it also resolves all variables specified in its free text fields. Because you can define variables at four different levels (trigger, task, workflow, and global), the Controller follows a prescribed formula to determine which variable takes precedence 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)

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

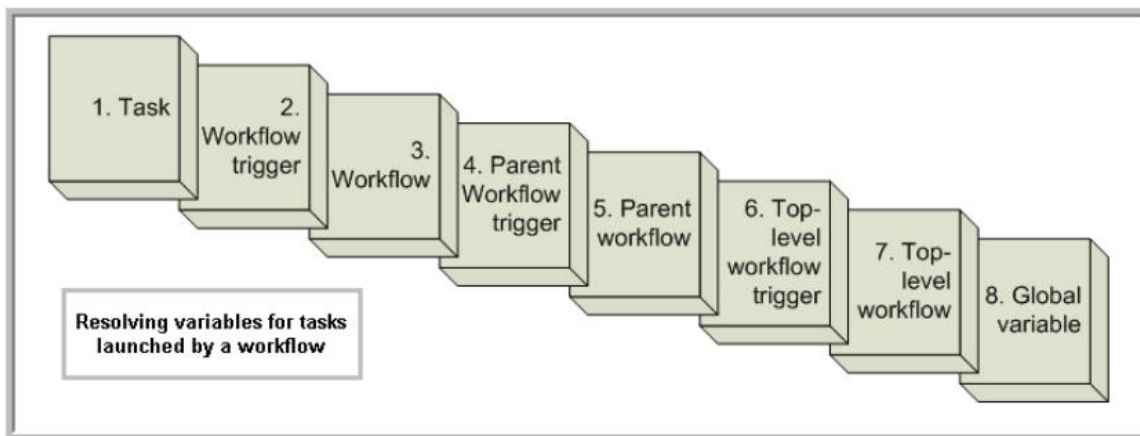
#### For Tasks Launched by a Trigger

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.



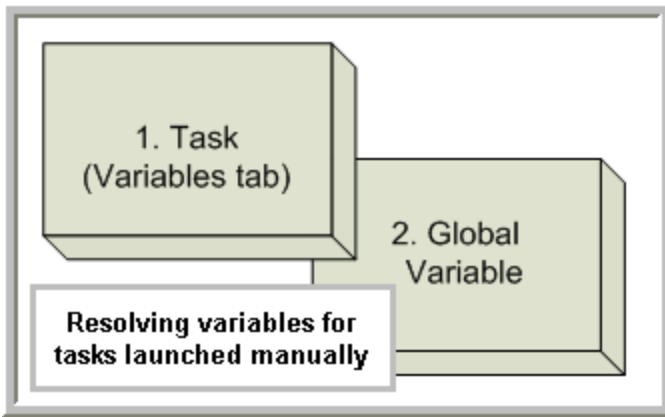
### For Tasks Launched by a Workflow

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 are:

```
#{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.

The screenshot shows the 'Variables' interface. At the top, there is a 'Variables' tab with a dropdown menu showing '5 Variables'. Below this is a table with columns: Name, Value, Description, Updated By, and Updated. The table contains five rows of variables, all with a value of '1' and updated by users named 'stonebranch-user-01' through 'stonebranch-user-05' on the date '2014-06-13 14:52:37 -0400' through '2014-06-13 14:52:57 -0400'. Below the table is the 'Variable Details' section, which has tabs for 'Variable' and 'Versions'. The 'Variable' tab is active, showing a 'Details' form with fields for Name, Value, Description, and Member of Business Services. The 'Version' field is set to '1'. There are 'Save' and 'New' buttons at the bottom of the details form.

Name	Value	Description	Updated By	Updated
stonebranch_variable_01	1		stonebranch-user-01	2014-06-13 14:52:37 -0400
stonebranch_variable_02	1		stonebranch-user-02	2014-06-13 14:52:47 -0400
stonebranch_variable_03	1		stonebranch-user-03	2014-06-13 14:52:50 -0400
stonebranch_variable_04	1		stonebranch-user-04	2014-06-13 14:52:53 -0400
stonebranch_variable_05	1		stonebranch-user-05	2014-06-13 14:52:57 -0400

**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 the **Save** button, or right-click in the Details and click **Save**, to save the record.





**Note**

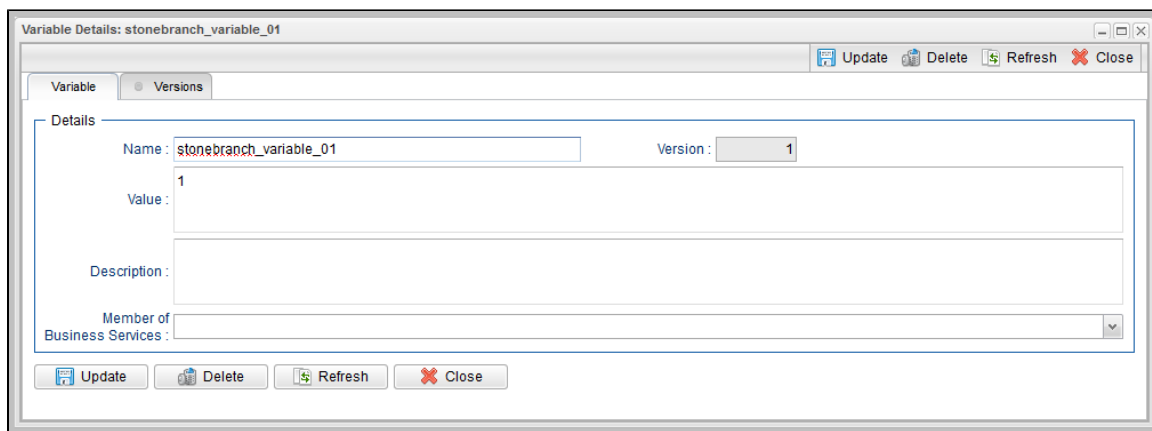
To **open** an existing record on the list, either:

- 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 40 alphanumeric. 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.  <div style="background-color: #ffe6e6; padding: 10px; border: 1px solid #ccc;"> <p> <b>Important</b> Do not define variables with the prefix <b>ops_</b>. The <b>ops_</b> prefix is reserved for built-in variables.</p> </div>
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 <a href="#">Versions tab</a> to view previous versions. For details, see <a href="#">Record Versioning</a> .
Value	Value of the variable.
Description	Optional. Description of this variable.

<b>Member of Business Services</b>	User-defined; allows you to select one or more <a href="#">Business Services</a> that this record belongs to.
<b>Save</b>	Saves a new variable record in the Controller database.
<b>Update button</b>	Saves updates to the record.
<b>Delete button</b>	Deletes the current record.
<b>Refresh</b>	Refreshes any dynamic data displayed in the Details.
<b>Close</b>	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:

The screenshot shows the 'Linux/Unix Tasks' interface. At the top, there is a list of 5 tasks with columns for Task Name, Task Description, Command or Script, Updated By, and Updated. Below the list is the 'Linux/Unix Task Details' view for a selected task. The 'General' tab is active, showing fields for Task Name, Version (1), Task Description, Member of Business Services, Hold on Start, Virtual Resource Priority (10), and Hold Resources on Failure. The 'Linux/Unix Details' section shows Agent and Agent Cluster fields.

**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.

The screenshot shows the 'Linux/Unix Task Details: stonebranch-linuxunixtask-01' window. The 'Variables' tab is selected, displaying a table of 2 variables. The table has columns for Name, Value, Description, Updated By, and Updated.

Name	Value	Description	Updated By	Updated
variable_1	1	the first variable.	ops.admin	2014-07-08 15:43:47 -0400
variable_2	2	The second variable	ops.admin	2014-07-08 15:44:12 -0400

**Step 3** Click the **New** button to display Variables Details for a new variable.

The screenshot shows a 'Variable Details' dialog box. It has a title bar with the text 'Variable Details' and standard window control buttons (minimize, maximize, close). Below the title bar is a tab labeled 'Variable'. The main content area is titled 'Details' and contains three input fields: 'Name:', 'Value:', and 'Description:'. At the bottom of the dialog are 'Save' and 'Close' buttons.

**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

- Overview
- Built-In Variable Categories
- Agent Variables
  - Agent Hostname
  - Agent IP Address
  - Agent IP Address
  - Agent Mode
  - Agent Name
  - Agent Queue Name
- Agent-Based Task Instance Variables
  - Agent Hostname
  - Agent IP Address
  - Agent Name
  - Agent Queue Name
- Application Monitor Trigger Variables
  - Trigger Application Name
  - Trigger Application Status
  - Trigger Application sys\_id
  - Trigger Application Type
- Cluster Node 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
- Composite Trigger Variables
  - Trigger Component Event Time
- File Monitor Task Instance/Trigger Variables
  - Base File Name
  - File Directory
  - File Directory (with Final Directory Separator)
  - File Directory (without Final Directory Separator)
  - File Extension
  - Separator
  - Trigger File Date
  - Trigger File Group
  - Trigger File Name
  - Trigger File Name (No Path)
  - Trigger File Owner
  - Trigger File Scan Result
  - Trigger File Size
- File Transfer Task Instance Variables
  - Destination Password
  - Destination User ID
  - Source Password
  - Source User ID
- FTP File Monitor Task Instance Variables
  - Base Trigger File Name
  - Files Matching Wildcard
  - Remote Trigger File Name
  - Remote Trigger File Name (No Path)
  - Trigger File Directory
  - Trigger File Directory (with Final Directory Separator)
  - Trigger File Directory (without Final Directory Separator)
  - Trigger File Extension
  - Trigger Wildcard
  - Trigger Wildcard Path Only
  - Trigger Wildcard Path Only (without Final Slash)
- OMS Server Variables
  - Last OMS Server Connected
  - OMS Server IP Address
  - OMS Server Status
  - OMS Server sys\_id
  - OMS Server Messaging Sessions Status
- SAP Task Instance Variables

- SAP InfoPackage Request ID
- SAP Job ID
- SAP Job Name
- SAP Process Chain ID
- SAP Process Chain Log ID
- SQL and Stored Procedure Task Instance Variables
  - Error Message
  - Processed Rows
  - Return Code for SQL Statement Outcome
- System Monitor Task Instance Variables
  - Actual Size
  - Actual Size (Rounded)
  - Actual Size (Scale)
  - Scale
  - Size
  - Size (Rounded)
- Task Instance 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
  - End Time
  - Execution User ID
  - Launch Time
  - Maximum Retry Count
  - Parent Workflow Instance sys\_id
  - Parent Workflow Name
  - Retry Count
  - Retry Interval
  - Running Time
  - Running Time (Text Format)
  - Script ID
  - Script Name
  - Script Parameters
  - Starting Time
  - Task Instance Attempts
  - Task Instance Exit Code
  - Task Instance Status
  - Task Instance sys\_id
  - Task Name
  - Task Reference Count
  - Task Type
- 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
- Variable Monitor Task Instance/Trigger Variables
  - Trigger Variable Name
  - Trigger Variable Value
  - Trigger Variable Previous Value
- z/OS Task Instance Variables
  - JCL Location
  - Job Number
  - Override JCL Location
  - Submitted JCL Location

## 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](#)
- [Application Monitor Trigger Variables](#)
- [Cluster Node Variables](#)
- [Composite Trigger Variables](#)
- [File Monitor Task Instance/Trigger Variables](#)
- [File Transfer Task Instance Variables](#)
- [FTP File Monitor Task Instance Variables](#)
- [OMS Server Variables](#)
- [SAP Task Instance Variables](#)
- [SQL and Stored Procedure Task Instance Variables](#)
- [System Monitor Task Instance Variables](#)
- [Task Instance Variables](#)
- [Task Monitor Task Instance/Trigger Variables](#)
- [Trigger Variables](#)
- [Variable Monitor Trigger Variables](#)
- [z/OS Task Instance Variables](#)

## Agent Variables

The following agent variables can be used to pass information into an [Agent notification](#).

### Agent Hostname

<b>Description</b>	Resolves to the agent hostname.
<b>Syntax</b>	<code>\${ops_agent_hostname}</code>
<b>Example</b>	

### Agent IP Address

<b>Description</b>	Resolves to the agent IP address (see also <code>\${ops_agent_ip}</code> ).
<b>Syntax</b>	<code>\${ops_agent_ipaddr}</code>
<b>Example</b>	

### Agent IP Address

<b>Description</b>	Resolves to the agent IP address.
<b>Syntax</b>	<code>\${ops_agent_ip}</code>
<b>Example</b>	

### Agent Mode

<b>Description</b>	Resolves to the agent operational mode (Active, Offline).
<b>Syntax</b>	<code>\${ops_agent_mode}</code>
<b>Example</b>	

### Agent Name

<b>Description</b>	Resolves to the agent name.
<b>Syntax</b>	<code>\${ops_agent_name}</code>
<b>Example</b>	

## Agent Queue Name

<b>Description</b>	Resolves to the agent queue name.
<b>Syntax</b>	<code>\${ops_agent_id}</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to the agent hostname.
<b>Syntax</b>	<code>\${ops_agent_hostname}</code>
<b>Example</b>	

### Agent IP Address

<b>Description</b>	Resolves to the agent IP address.
<b>Syntax</b>	<code>\${ops_agent_ip}</code>
<b>Example</b>	

### Agent Name

<b>Description</b>	Resolves to the agent name.
<b>Syntax</b>	<code>\${ops_agent_name}</code>
<b>Example</b>	

### Agent Queue Name

<b>Description</b>	Resolves to the <code>sys_id</code> of the agent.
<b>Syntax</b>	<code>\${ops_agent_id}</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to the name of the Application being monitored by the trigger.
--------------------	---

<b>Syntax</b>	<code>\${ops_trigger_appl_name}</code>
<b>Example</b>	

### Trigger Application Status

<b>Description</b>	Resolves to the status of the Application being monitored by the trigger.
<b>Syntax</b>	<code>\${ops_trigger_appl_status}</code>
<b>Example</b>	

### Trigger Application sys\_id

<b>Description</b>	Resolves to the <code>sys_id</code> of the application.
<b>Syntax</b>	<code>\${ops_trigger_appl_id}</code>
<b>Example</b>	

### Trigger Application Type

<b>Description</b>	Resolves to the type of Application being monitored by the trigger, as defined by the Application Type field.
<b>Syntax</b>	<code>\${ops_trigger_appl_type}</code>
<b>Example</b>	

## Cluster Node Variables

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

### Cluster Node Hostname

<b>Description</b>	Resolves to the hostname of this cluster node.
<b>Syntax</b>	<code>\${ops_cluster_hostname}</code>
<b>Example</b>	<pre>ops_cluster_hostname = MACHINEC19A</pre>

### Cluster Node ID

<b>Description</b>	Resolves to the cluster node's internally-generated build ID.
<b>Syntax</b>	<code>\${ops_cluster_id}</code>
<b>Example</b>	<pre>ops_cluster_id = MACHINEC19A:8080-opwise</pre>

### Cluster Node IP Address

<b>Description</b>	Resolves to the IP address of this cluster node.
<b>Syntax</b>	<code>\${ops_cluster_ipaddr}</code>



<b>Example</b>	<pre>ops_cluster_ipaddr = 10.N.N.NN</pre>
----------------	---

## Cluster Node Mode

<b>Description</b>	Resolves to the current mode of this cluster node: Offline, Active, Passive. For more information, see <a href="#">Viewing Node Status</a> .
<b>Syntax</b>	<code>\${ops_cluster_mode}</code>
<b>Example</b>	<pre>ops_cluster_mode = Active</pre>

## Cluster Node Name

<b>Description</b>	<code>\${ops_cluster_name}</code> is an alias for the <code>\${ops_cluster_id}</code> variable.
<b>Syntax</b>	<code>\${ops_cluster_name}</code>
<b>Example</b>	<pre>ops_cluster_name = MACHINEC19A:8080-opswise</pre>

## Cluster Node Running Time

<b>Description</b>	Resolves to the numbers of days, hours, and minutes that this cluster node has been running since it was last started.
<b>Syntax</b>	<code>\${ops_cluster_uptime}</code>
<b>Example</b>	<pre>ops_cluster_uptime = 7 Seconds</pre>

## Cluster Node Start Time

<b>Description</b>	Resolves to the date and time the cluster node (server) was started.
<b>Syntax</b>	<code>\${ops_cluster_start_time}</code>
<b>Example</b>	<pre>ops_cluster_start_time = 2011-09-26 17:35:01 -0400</pre>

## 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

<b>Description</b>	Resolves to the time when a Composite Trigger component fired.
<b>Syntax</b>	<code>\${&lt;prefix&gt;_trigger_component_event_time}</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to the base file name.
<b>Syntax</b>	<code>\${ops_trigger_file_name_simple}</code>

### File Directory

<b>Description</b>	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 <code>\${ops_trigger_file_fullpath}</code> and <code>\${ops_trigger_file_fullpath_no_separator}</code> , respectively.
<b>Syntax</b>	<code>\${ops_trigger_file_path}</code>
<b>Example</b>	
<b>Example</b>	

### File Directory (with Final Directory Separator)

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

### File Directory (without Final Directory Separator)

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

### File Extension

<b>Description</b>	Resolves to the file extension of a file.
<b>Syntax</b>	<code>\${ops_trigger_file_name_extension}</code>
<b>Example</b>	

### Separator

<b>Description</b>	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.
<b>Syntax</b>	<code>\${ops_trigger_file_separator}</code>
<b>Example</b>	<pre> \${ops_trigger_file_fullpath}sub_folder_name \${ops_trigger_file_separator}filename.txt                     </pre>

### Trigger File Date

<b>Description</b>	Resolves to the file date of the file that fired the trigger.
<b>Syntax</b>	<code>\${ops_trigger_file_date}</code>
<b>Example</b>	

### Trigger File Group

<b>Description</b>	Resolves to the file group of the file that fired the trigger.
<b>Syntax</b>	<code>\${ops_trigger_file_group}</code>
<b>Example</b>	

### Trigger File Name

<b>Description</b>	Resolves to the name of the file that fired the trigger.
<b>Syntax</b>	<code>\${ops_trigger_file_name}</code>
<b>Example</b>	

### Trigger File Name (No Path)

<b>Description</b>	Resolves to the name of the file that fired the trigger, but without any path information.
<b>Syntax</b>	<code>\${ops_trigger_file_name_nopath}</code>
<b>Example</b>	

### Trigger File Owner

<b>Description</b>	Resolves to the file owner of the file that fired the trigger.
<b>Syntax</b>	<code>\${ops_trigger_file_owner}</code>
<b>Example</b>	

### Trigger File Scan Result

<b>Description</b>	Resolves to the result of the file scan: FOUND or NOT_FOUND.
<b>Syntax</b>	<code>\${ops_trigger_file_scan}</code>
<b>Example</b>	

### Trigger File Size

<b>Description</b>	Resolves to the file size of the file that fired the trigger.
<b>Syntax</b>	<code>\$(ops_trigger_file_size)</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to the destination password.
<b>Syntax</b>	<code>\$(ops_dst_cred_pwd)</code>
<b>Example</b>	

## Destination User ID

<b>Description</b>	Resolves to the destination user ID.
<b>Syntax</b>	<code>\$(ops_dst_cred_user)</code>
<b>Example</b>	

## Source Password

<b>Description</b>	Resolves to the source password.
<b>Syntax</b>	<code>\$(ops_src_cred_pwd)</code>
<b>Example</b>	

## Source User ID

<b>Description</b>	Resolves to the source user ID.
<b>Syntax</b>	<code>\$(ops_src_cred_user)</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to the base file name.
<b>Syntax</b>	<code>\${ops_trigger_file_name_simple}</code>
<b>Example</b>	

### Files Matching Wildcard

<b>Description</b>	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.
<b>Syntax</b>	<code>\${ops_trigger_files}</code>
<b>Example</b>	<div style="border: 1px solid #ccc; padding: 5px; width: fit-content; margin: 5px auto;"> <code>ops_trigger_files = COMPANY-2011-11-22.xls, COMPANY-2011-11-23.xls,COMPANY-2011-11-24.xls</code> </div>

### Remote Trigger File Name

<b>Description</b>	Resolves to the remote file name.
<b>Syntax</b>	<code>\${ops_trigger_file_name}</code>
<b>Example</b>	

### Remote Trigger File Name (No Path)

<b>Description</b>	Resolves to the remote file name without any path information.
<b>Syntax</b>	<code>\${ops_trigger_file_name_nopath}</code>
<b>Example</b>	

### Trigger File Directory

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

### Trigger File Directory (with Final Directory Separator)

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

### Trigger File Directory (without Final Directory Separator)

<b>Description</b>	Resolves to the directory where the remote file is located, but not the file itself; does not include the final directory separator.
<b>Syntax</b>	<code>\${ops_trigger_file_fullpath_no_separator}</code>
<b>Example</b>	

## Trigger File Extension

<b>Description</b>	Resolves to the file extension of the file.
<b>Syntax</b>	<code>\${ops_trigger_file_name_extension}</code>
<b>Example</b>	

## Trigger Wildcard

<b>Description</b>	Resolves to the contents of the Remote Filename field in the <a href="#">FTP File Monitor</a> task.
<b>Syntax</b>	<code>\${ops_trigger_wildcard}</code>
<b>Example</b>	<pre>ops_trigger_wildcard = /home/prod/stonebranch/COMPANY*.xls</pre>

## Trigger Wildcard Path Only

<b>Description</b>	Resolves to the path only, with the final slash but without the file name, from the Remote Filename field in the <a href="#">FTP File Monitor</a> task.
<b>Syntax</b>	<code>\${ops_trigger_wildcard_path}</code>
<b>Example</b>	<pre>ops_trigger_wildcard_path = /home/prod/stonebranch/</pre>

## Trigger Wildcard Path Only (without Final Slash)

<b>Description</b>	Resolves to the path only, without the final slash and without the file name, from the Remote Filename field in the <a href="#">FTP File Monitor</a> task.
<b>Syntax</b>	<code>\${ops_trigger_wildcard_path_no_separator}</code>
<b>Example</b>	<pre>ops_trigger_wildcard_path_no_separator = /home/prod/stonebranch</pre>

## OMS Server Variables

The following OMS Server variables allow you to pass information into an [OMS Server](#) notification.

### Last OMS Server Connected

<b>Description</b>	Resolves to the last OMS Server connected to the Controller in an OMS HA cluster.
<b>Syntax</b>	<code>\${ops_oms_last_connected}</code>
<b>Example</b>	

## OMS Server IP Address

<b>Description</b>	Resolves to the OMS Server IP address.
<b>Syntax</b>	<code>\${ops_oms_server_address}</code>
<b>Example</b>	

## OMS Server Status

<b>Description</b>	Resolves to the current status of the OMS Server.
<b>Syntax</b>	<code>\${ops_oms_status}</code>
<b>Example</b>	

## OMS Server sys\_id

<b>Description</b>	Resolves to the <code>sys_id</code> of the OMS server.
<b>Syntax</b>	<code>\${ops_oms_id}</code>
<b>Example</b>	

## OMS Server Messaging Sessions Status

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

## 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

<b>Description</b>	Resolves to the SAP InfoPackage Request ID.
<b>Syntax</b>	<code>\${ops_sap_requestid}</code>
<b>Example</b>	

### SAP Job ID

<b>Description</b>	Resolves to the SAP job ID.
<b>Syntax</b>	<code>\${ops_sap_jobid}</code>
<b>Example</b>	

### SAP Job Name

<b>Description</b>	Resolves to the SAP job name.
<b>Syntax</b>	<code>\${ops_sap_jobname}</code>

<b>Example</b>	
----------------	--

## SAP Process Chain ID

<b>Description</b>	Resolves to the SAP Process Chain ID.
<b>Syntax</b>	<code>\${ops_sap_chainid}</code>
<b>Example</b>	

## SAP Process Chain Log ID

<b>Description</b>	Resolves to the SAP Process Chain Log ID.
<b>Syntax</b>	<code>\${ops_sap_logid}</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to any error message generated by the database.
<b>Syntax</b>	<code>\${ops_sql_error_msg}</code>
<b>Example</b>	

### Processed Rows

<b>Description</b>	Resolves to the number of rows processed.
<b>Syntax</b>	<code>\${ops_sql_rows}</code>
<b>Example</b>	

### Return Code for SQL Statement Outcome

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

## 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

<b>Description</b>	Actual size determined by the agent.
<b>Syntax</b>	<code>\${ops_sm_actual_size}</code>
<b>Example</b>	



## Actual Size (Rounded)

<b>Description</b>	Same as ops_sm_actual_size, except rounded to the nearest integer.
<b>Syntax</b>	\${ops_sm_actual_int_size}
<b>Example</b>	

## Actual Size (Scale)

<b>Description</b>	Scale of the actual size determined by the agent.
<b>Syntax</b>	\${ops_sm_actual_scale}
<b>Example</b>	

## Scale

<b>Description</b>	Scale specified in the <b>By Scale</b> field for <b>Resource Available</b> of the System Monitor task definition.
<b>Syntax</b>	\${ops_sm_scale}
<b>Example</b>	

## Size

<b>Description</b>	Size specified in the <b>Resource Available</b> field of the System Monitor task definition.
<b>Syntax</b>	\${ops_sm_size}
<b>Example</b>	

## Size (Rounded)

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

## Task Instance Variables

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

### Cluster Node Hostname

<b>Description</b>	Resolves to the hostname of the Active cluster node.
<b>Syntax</b>	\${ops_cluster_hostname}
<b>Example</b>	<pre>ops_cluster_hostname = MACHINEC19A</pre>

### Cluster Node ID

<b>Description</b>	Resolves to the Active cluster node's internally-generated build ID.
--------------------	--

<b>Syntax</b>	<code>\${ops_cluster_id}</code>
<b>Example</b>	<pre>ops_cluster_id = MACHINEC19A:8080-opwise</pre>

## Cluster Node IP Address

<b>Description</b>	Resolves to the IP address of the Active cluster node.
<b>Syntax</b>	<code>\${ops_cluster_ipaddr}</code>
<b>Example</b>	<pre>ops_cluster_ipaddr = 10.N.N.NN</pre>

## Cluster Node Mode

<b>Description</b>	Resolves to the current mode of the cluster node: Offline, Active, Passive. For more information, see <a href="#">Viewing Node Status</a> .
<b>Syntax</b>	<code>\${ops_cluster_mode}</code>
<b>Example</b>	<pre>ops_cluster_mode = Active</pre>

## Cluster Node Name

<b>Description</b>	<code>\${ops_cluster_name}</code> is an alias for the <code>\${ops_cluster_id}</code> variable.
<b>Syntax</b>	<code>\${ops_cluster_name}</code>
<b>Example</b>	<pre>ops_cluster_name = MACHINEC19A:8080-opwise</pre>

## Cluster Node Running Time

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

## Cluster Node Start Time

<b>Description</b>	Resolves to the date and time the Active cluster node (server) was started.
<b>Syntax</b>	<code>\${ops_cluster_start_time}</code>

<b>Example</b>	<pre>ops_cluster_start_time = 2011-09-26 17:35:01 -0400</pre>
----------------	---

## Command

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

## Command Parameters

<b>Description</b>	For tasks that launch a command on a Windows or Linux/Unix machine; resolves to the task command parameters.
<b>Syntax</b>	\${ops_cmd_parms}
<b>Example</b>	

## End Time

<b>Description</b>	Resolves to the task ending time.
<b>Syntax</b>	\${ops_end_time}
<b>Example</b>	

## Execution User ID

<b>Description</b>	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.
<b>Syntax</b>	\${ops_execution_user}
<b>Example</b>	

## Launch Time

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

## Maximum Retry Count

<b>Description</b>	Resolves to the maximum retry count.
<b>Syntax</b>	\${ops_retry_maximum}
<b>Example</b>	

## Parent Workflow Instance sys\_id

<b>Description</b>	Resolves to the <a href="#">sys_id</a> of the parent workflow task instance.
<b>Syntax</b>	\${ops_workflow_id}

<b>Example</b>	
----------------	--

## Parent Workflow Name

<b>Description</b>	Resolves to the name of the parent workflow.
<b>Syntax</b>	<code>\${ops_workflow_name}</code>
<b>Example</b>	

## Retry Count

<b>Description</b>	Resolves to the current retry count.
<b>Syntax</b>	<code>\${ops_retry_count}</code>
<b>Example</b>	

## Retry Interval

<b>Description</b>	Resolves to the retry interval (seconds).
<b>Syntax</b>	<code>\${ops_retry_interval}</code>
<b>Example</b>	

## Running Time

<b>Description</b>	Resolves to the task running time in milliseconds.
<b>Syntax</b>	<code>\${ops_duration}</code>
<b>Example</b>	<code>ops_duration = 130000</code>

## Running Time (Text Format)

<b>Description</b>	Resolves to the task running time in a more readable representation of the duration time.
<b>Syntax</b>	<code>\${ops_duration_text}</code>
<b>Example</b>	<code>ops_duration_text = 2 Minutes 10 Seconds)</code>

## Script ID

<b>Description</b>	For Windows, Linux/Unix, and SAP tasks where a Script or SAP Definition from <a href="#">Scripts</a> is specified; resolves to the Controller system ID of the script.
<b>Syntax</b>	<code>\${ops_script_id}</code>
<b>Example</b>	

## Script Name

<b>Description</b>	For Windows, Linux/Unix, and SAP tasks where a Script or SAP Definition from <a href="#">Scripts</a> is specified; resolves to the Controller name of the script.
<b>Syntax</b>	<code>\${ops_script_name}</code>
<b>Example</b>	

## Script Parameters

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

## Starting Time

<b>Description</b>	Resolves to the task starting time.
<b>Syntax</b>	<code>\${ops_start_time}</code>
<b>Example</b>	

## Task Instance Attempts

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

## Task Instance Exit Code

<b>Description</b>	Resolves to the task instance exit code, if any.
<b>Syntax</b>	<code>\${ops_exit_code}</code>
<b>Example</b>	

## Task Instance Status

<b>Description</b>	Resolves to the current task instance status.
<b>Syntax</b>	<code>\${ops_status}</code>
<b>Example</b>	

## Task Instance sys\_id

<b>Description</b>	Resolves to the <code>sys_id</code> of the task instance.
<b>Syntax</b>	<code>\${ops_task_id}</code>
<b>Example</b>	

## Task Name

<b>Description</b>	Resolves to the task name.
<b>Syntax</b>	<code>\${ops_task_name}</code>
<b>Example</b>	

## Task Reference Count

<b>Description</b>	Resolves to the current task reference count.  Each time an instance is created from a specific task, it gets a unique task reference count for that task. For example, if you launch a task twice, the first instance will have task reference count 1, and the second will have task reference count 2.
<b>Syntax</b>	<code>\${ops_task_ref_count}</code>
<b>Example</b>	

## Task Type

<b>Description</b>	Resolves to the task type.
<b>Syntax</b>	<code>\${ops_task_type}</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to the name of the task instance that fired the trigger.
<b>Syntax</b>	<code>\${ops_trigger_task_name}</code>
<b>Example</b>	

### Trigger Task Status

<b>Description</b>	Resolves to the status of the task instance that fired the trigger.
<b>Syntax</b>	<code>\${ops_trigger_task_status}</code>
<b>Example</b>	

### Trigger Task sys\_id

<b>Description</b>	Resolves to the <a href="#">sys_id</a> of the task instance that fired the trigger.
<b>Syntax</b>	<code>\${ops_trigger_task_id}</code>
<b>Example</b>	

### Trigger Task Type

<b>Description</b>	Resolves to the type of the task instance that fired the trigger.
<b>Syntax</b>	<code>\${ops_trigger_task_type}</code>
<b>Example</b>	

### Trigger Workflow

<b>Description</b>	Resolves to the name of the workflow instance that fired the trigger.  This variable is available only for a <a href="#">Task Monitor</a> task that has a <a href="#">Workflow Condition</a> specified. If a workflow condition is specified, <code>\${ops_trigger_workflow_name}</code> will resolve to the name of the workflow instance that the workflow condition matched.
<b>Syntax</b>	<code>\${ops_trigger_workflow_name}</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to the name of the trigger that launched the task instance.
<b>Syntax</b>	<code>\${ops_trigger_name}</code>
<b>Example</b>	

### Trigger Time

<b>Description</b>	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.
<b>Syntax</b>	<code>\${ops_trigger_time}</code>
<b>Example</b>	

## 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

<b>Description</b>	Resolves to the name of the variable being monitored.
<b>Syntax</b>	<code>\${ops_trigger_variable_name}</code>
<b>Example</b>	

### Trigger Variable Value

<b>Description</b>	Resolves to the current value of the variable being monitored.
<b>Syntax</b>	<code>\${ops_trigger_variable_value}</code>
<b>Example</b>	

## Trigger Variable Previous Value

<b>Description</b>	Resolves to previous value of the variable being monitored.
<b>Syntax</b>	<code>\${ops_trigger_variable_prev_value}</code>
<b>Example</b>	

## z/OS Task Instance Variables

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

### JCL Location

<b>Description</b>	Resolves to the file and member name containing the JCL script.
<b>Syntax</b>	<code>\${ops_jcl_location}</code>
<b>Example</b>	

### Job Number

<b>Description</b>	Resolves to the job number assigned to the job by JES.
<b>Syntax</b>	<code>\${ops_job_id}</code>
<b>Example</b>	

### Override JCL Location

<b>Description</b>	Resolves to the file and member name of the JCL location containing a potential override JCL script.
<b>Syntax</b>	<code>\${ops_override_jcl_location}</code>
<b>Example</b>	

### Submitted JCL Location

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



## 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](#)
- [Variables and Variable Scope](#)
- [Creating a Set Variable Action](#)
- [Set Variable Details Field Descriptions](#)

### 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 on a Set Variable action screen let you specify, in the [Variable Scope](#) field, the scope of that variable. You can specify that a variable be available for:

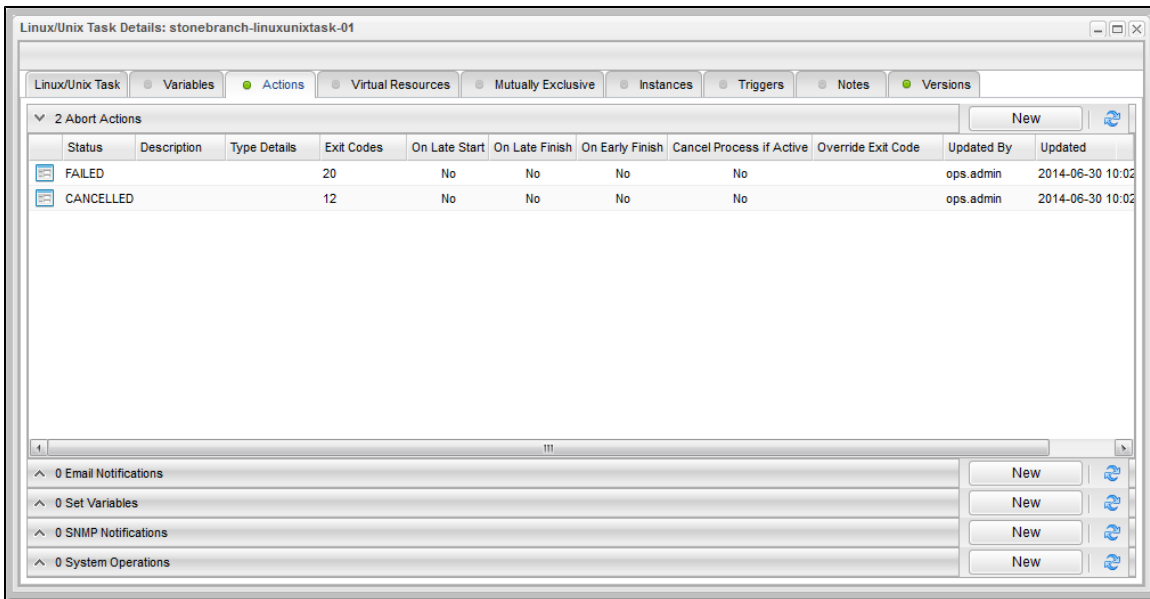
- Only the task where it is set.
- All tasks within the task's parent (immediate) workflow.
- All tasks within the task's top-level parent workflow.
- All tasks and workflow instances.

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.

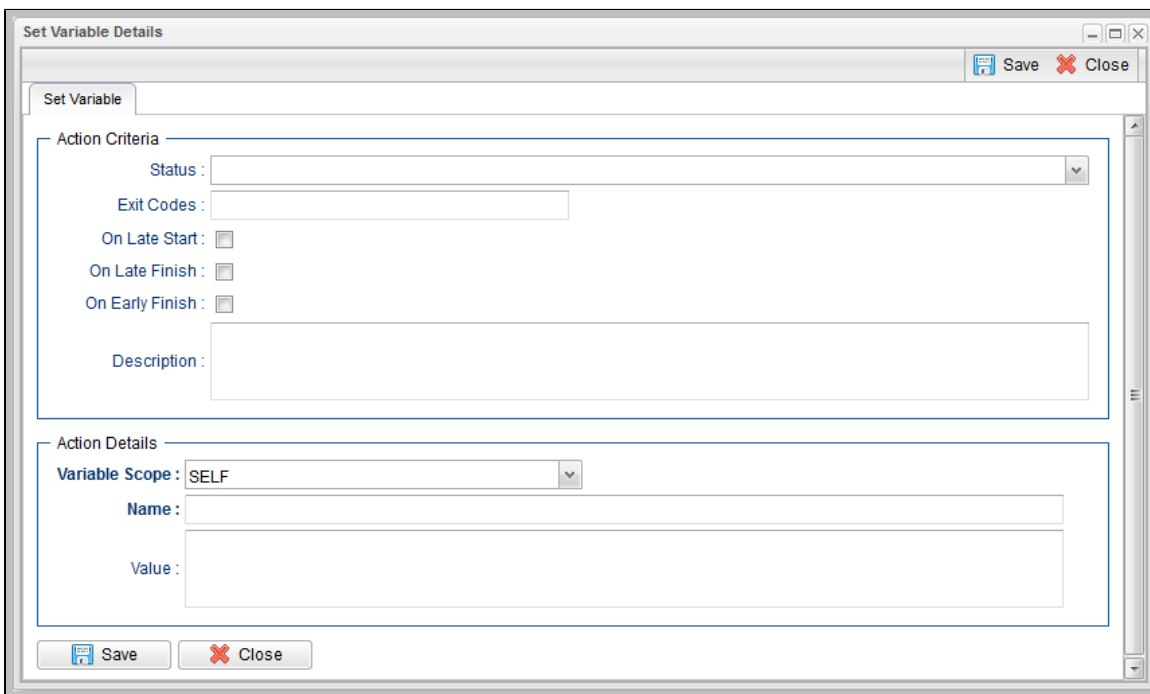
### Creating a Set Variable Action

**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 the **Save** button, or right-click in the Details and then click **Save**, to save the record and return to the Actions List.


**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
------------	-------------

<b>Action Criteria</b>	This section contains criteria for performing the action.															
Type Details	Displays - on the Set Variables actions list - the <a href="#">Variable Scope</a> , <a href="#">Name</a> , and <a href="#">Value</a> for this action.															
Action Inheritance	<p>For Workflow tasks only; the records that this action applies to.</p> <p>Options:</p> <ul style="list-style-type: none"> <li>• <b>SELF</b> The action applies only to the workflow; it is not inherited by its children tasks. For example, if the action is defined for the <a href="#">Defined</a> status, when the workflow where the action is specified transitions into the <a href="#">Defined</a> status, the action will run for the workflow. When children within this workflow transition into the <a href="#">Defined</a> status, the action will not run.</li> <li>• <b>SELF/CHILDREN</b> 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 <a href="#">Defined</a> status, the action will run.</li> <li>• <b>CHILDREN</b> 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 <a href="#">Defined</a> status, the action will run. However, when the workflow where this action is specified transitions into the <a href="#">Defined</a> status, this action will not run.</li> </ul>															
Status	The <a href="#">status</a> 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.															
<b>Action Details</b>	This section contains additional details about the action.															
Variable Scope	<p>Applies to variables associated with a task in a workflow.</p> <p>Options:</p> <table border="1"> <thead> <tr> <th>Scope</th> <th>Scope Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>SELF</b></td> <td>1</td> <td>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.</td> </tr> <tr> <td><b>PARENT</b></td> <td>2</td> <td>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).</td> </tr> <tr> <td><b>TOP_LEVEL_PARENT</b></td> <td>3</td> <td>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.</td> </tr> <tr> <td><b>GLOBAL</b></td> <td>4</td> <td>A global variable will be updated and or created. Allows for variables to be shared across independent workflows.</td> </tr> </tbody> </table>	Scope	Scope Value	Description	<b>SELF</b>	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.	<b>PARENT</b>	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).	<b>TOP_LEVEL_PARENT</b>	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.	<b>GLOBAL</b>	4	A global variable will be updated and or created. Allows for variables to be shared across independent workflows.
Scope	Scope Value	Description														
<b>SELF</b>	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.														
<b>PARENT</b>	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).														
<b>TOP_LEVEL_PARENT</b>	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.														
<b>GLOBAL</b>	4	A global variable will be updated and or created. Allows for variables to be shared across independent workflows.														

<p>Name</p>	<p>Name of the variable. Up to 40 alphanumeric. 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.</p> <div style="background-color: #f8d7da; padding: 10px; margin-top: 10px;"> <p> <b>Important</b> Do not define variables with the prefix <b>ops_</b>. The <b>ops_</b> prefix is reserved for built-in variables.</p> </div>
<p>Value</p>	<p>Value of the variable.</p>
<p><b>Buttons</b></p>	<p>This section identifies the buttons displayed above and below the Action Details that let you perform various actions.</p>
<p><b>Save</b></p>	<p>Saves a new Action record in the Controller database.</p>
<p><b>Update</b></p>	<p>Saves updates to the record.</p>
<p><b>Delete</b></p>	<p>Deletes the current record.</p>
<p><b>Refresh</b></p>	<p>Refreshes any dynamic data displayed in the Details.</p>
<p><b>Close</b></p>	<p>Closes the Details pop-up of this action.</p>

## 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

- Overview
- Formatting Rules
- Function Categories
- Conditional Functions
  - Return Conditional Value Depending on Equality of String Parameters
  - Return Conditional Value Depending on Value of Boolean Parameter
- Date Functions
  - Checks if Date Argument Equals Today's Date
  - Resolve to Current Date and Time
  - Resolve to Current Date and Time (Advanced)
  - Resolve to Current Unix Epoch Time
  - Return Date with Offsets
  - Return Date with Offsets (Advanced)
  - Return Day of Week
  - Return Days between Dates
  - Return Non-Business Day of Month
  - Return Nth Business Day of Month
  - Return Nth Day of Month
  - Return Number of Business Days between Dates
- Mathematical Functions
  - Add
  - Divide
  - Multiply
  - Return Absolute Value
  - Return Modulo
  - Subtract
- SQL/Stored Procedure Functions
  - Return Column Names for SQL Results from Current Task
  - Return Column Names for SQL Results from Sibling Task
  - Return SQL Results from Current Task
  - Return SQL Results from Sibling Task
  - Return SQL Warnings from Current Task
  - Return SQL Warnings from Sibling Task
  - Return String Value of Row/Column by Column Name
  - Return String Value of Row/Column by Column Number
  - Return String Values of Columns
- String Functions
  - Convert Characters in Value to Lower Case
  - Convert Characters in Value to Upper Case
  - Convert Characters in Variable to Lower Case
  - Convert Characters in Variable to Upper Case
  - Replace Substring of Value with Regular Expression
  - Replace Substring of Variable with Regular Expression
  - Return Copy of Value with Whitespace Omitted
  - Return Copy of Variable with Whitespace Omitted
  - Return Index of Substring in String Value
  - Return Index of Substring in String Variable
  - Return Index of Substring Plus Offset in String Value
  - Return Index of Substring Plus Offset in String Variable
  - Return Index of Rightmost Occurrence of Substring in String Value
  - Return Index of Rightmost Occurrence of Substring in String Variable
  - Return Index of Rightmost Occurrence of Substring Plus Offset in String Value
  - Return Index of Rightmost Occurrence of Substring Plus Offset in String Variable
  - Return Length of Value
  - Return Length of Variable
  - Return New String that is Substring of Value
  - Return New String that is Substring of Variable
- System Functions
  - Display Variables
  - Generate Random Number
  - Resolve to GUID (Globally Unique ID)
  - Resolve to Host Name
  - Resolve to IP Address
  - Resolve to SYS\_ID
  - Resolve to Variable Value
  - Resolve Variable
  - Resolve Variable (Advanced)



## 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 or exactly as shown in the tables on this page.
- Any parameter can be quoted. Strings must be quoted with single or double quotation marks.
- 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](#)
- [Date functions](#)
- [Mathematical functions](#)
- [SQL/Stored Procedure functions](#)
- [String functions](#)
- [System functions](#)

## Conditional Functions

### Return Conditional Value Depending on Equality of String Parameters

<b>Description</b>	Returns a conditional value depending on the equality of two string parameters. (Returns <code>if_value</code> if string <code>value1</code> is equal to string <code>value2</code> ; otherwise, <code>else_value</code> is returned.)
<b>Syntax</b>	<code>\${_ifEqual(value1, value2, if_value, else_value[, ignore_case])}</code>

<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>value1</code> Required; First string.</li> <li>• <code>value2</code> Required; Second string.</li> <li>• <code>if_value</code> Required; Return value if <code>value1</code> equals <code>value2</code>.</li> <li>• <code>else_value</code> Required; Return value if <code>value1</code> does not equal <code>value2</code>.</li> <li>• <code>ignore_case</code> Optional; Specification (<b>true</b> or <b>false</b>) whether or not to ignore case when comparing <code>value1</code> and <code>value2</code>. Default is <b>false</b>.</li> </ul>
<b>Examples</b>	<pre>                 \${_ifEqual('abc','def','YES','NO')}                 \${_ifEqual('abc','ABC','YES','NO',true)}                 \${_ifEqual('2015-08-15','\${__date()}', '17:00', '18:00')}             </pre>

## Return Conditional Value Depending on Value of Boolean Parameter

<b>Description</b>	Returns a conditional value depending on the value of a boolean parameter.  Returns <code>if_value</code> if <code>value</code> is <b>true</b> ; otherwise, <code>else_value</code> is returned.
<b>Syntax</b>	<code>\${_ifTrue(value, if_value, else_value)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>value</code> Required; Boolean value (<b>true</b> or <b>false</b>).</li> <li>• <code>if_value</code> Required; Return value if <code>value</code> is <b>true</b>.</li> <li>• <code>else_value</code> Required; Return value if <code>value</code> is <b>false</b>.</li> </ul>
<b>Example</b>	<pre>                 \${_ifTrue(\${__isToday('Mon', 'E')}, '20:00', '22:00')}             </pre>

## Date Functions

### Checks if Date Argument Equals Today's Date

<b>Description</b>	Checks if a date argument is equal to today's date in the specified format.  Returns <b>true</b> if <code>date</code> is equal to today's date in the specified format; otherwise, <b>false</b> is returned.
<b>Syntax</b>	<code>\${_isToday(date[, format, is_relative])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>date</code> Required; Date to compare to today's date.</li> <li>• <code>format</code> Optional; Format of today's date. Default is yyyy-MM-dd.</li> <li>• <code>is_relative</code> Optional; Specification (<b>true</b> or <b>false</b>) for whether today's date is relative to the trigger/launch time of the task instance. Default is <b>false</b>.</li> </ul>

<b>Examples</b>	<pre> \${_isToday('Wed', 'E')} \${_isToday('\${_dayOfMonth(1,"",true)}')}                     </pre>
-----------------	--

## Resolve to Current Date and Time

<b>Description</b>	Resolves to the current date and time.
<b>Syntax</b>	<code>\${_date([format, day_offset, hour_offset, minute_offset])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>format</code> Optional; Date format. The default format is yyyy-MM-dd HH:mm:ss Z. For details on the <code>format</code> parameter, see <a href="http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html">http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html</a></li> <li><code>day_offset</code> Optional; +/- number of days to offset.</li> <li><code>hour_offset</code> Optional; +/- number of hours to offset.</li> <li><code>minute_offset</code> Optional; +/- number of minutes to offset.</li> </ul>
<b>Examples</b>	<pre> \${_date} --&gt; 2012-07-14 12:43:06 -0400 \${_date()} --&gt; 2012-07-14 12:43:06 -0400 \${_date("yyyy-MM-dd", 5)} --&gt; 2012-07-19 \${_date("yyyy-MM-dd HH:mm:ss", -2, -1)} --&gt; 2012-07-12 11:43:06 \${_date("", 0, 0, 10)} --&gt; 2012-07-14 12:53:06 -0400                     </pre>


## Resolve to Current Date and Time (Advanced)

<b>Description</b>	Resolves to the current date and time.
<b>Syntax</b>	<code>\${_dateadv([format, year_offset, month_offset, day_offset, hour_offset, minute_offset])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>format</code> Date format. The default format is yyyy-MM-dd HH:mm:ss Z. For details on the <code>format</code> parameter, see <a href="http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html">http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html</a></li> <li><code>year_offset</code> Optional; +/- number of years to offset.</li> <li><code>month_offset</code> Optional; +/- number of months to offset.</li> <li><code>day_offset</code> Optional; +/- number of days to offset.</li> <li><code>hour_offset</code> Optional; +/- number of hours to offset.</li> <li><code>minute_offset</code> Optional; +/- number of minutes to offset.</li> </ul>
<b>Examples</b>	<pre> \${_dateadv} --&gt; 2012-07-29 09:31:42 -0700 \${_dateadv("yyyy-MMM", -1)} --&gt; 2011-Jul \${_dateadv("yyyy-MMM", 0, -1)} --&gt; 2012-Jun                     </pre>


## Resolve to Current Unix Epoch Time

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

## Return Date with Offsets

<b>Description</b>	<p>Returns the date after applying offsets. Optionally, can specify the output format.</p> <div style="background-color: #ffffcc; padding: 10px; border: 1px solid #ccc;">  Whether a holiday is treated as a business day or a non-business day is specified by the <a href="#">Exclude Holidays for Business Days</a> Universal Controller system property.                 </div>
<b>Syntax</b>	<code>\${_formatDate}([date, format, day_offset, use_business_days, hour_offset, minute_offset])</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>date</code> Date in format yyyy-MM-dd HH:mm or yyyy-MM-dd. Time (HH:mm) is optional. Default is the current date and time.</li> <li>• <code>format</code> 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 <code>format</code> parameter, see <a href="http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html">http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html</a></li> <li>• <code>day_offset</code> +/- number of days to offset.</li> <li>• <code>use_business_days</code> Specification (<code>true</code> or <code>false</code>) for whether <code>day_offset</code> is for business days. Default is <code>false</code>.</li> <li>• <code>hour_offset</code> +/- number of hours to offset.</li> <li>• <code>minute_offset</code> +/- number of minutes to offset.</li> </ul>
<b>Example</b>	<pre> \${_formatDate} --&gt; 2012-08-24 15:37 \${_formatDate()} --&gt; 2012-08-24 15:37 \${_formatDate("", "MMdyyy", 5)} --&gt; 08292012 \${_formatDate("2012-09-01", "", 5)} --&gt; 2012-09-06 \${_formatDate("2012-09-01", "", -5)} --&gt; 2012-08-27 \${_formatDate("2012-09-01", "", 5, true)} --&gt; 2012-09-10                     </pre>

## Return Date with Offsets (Advanced)

<b>Description</b>	<p>Returns the date after applying offsets. Optionally, can specify the output format.</p> <div style="background-color: #ffffcc; padding: 10px; border: 1px solid #ccc;">  Whether a holiday is treated as a business day or a non-business day is specified by the <a href="#">Exclude Holidays for Business Days</a> Universal Controller system property.                 </div>
<b>Syntax</b>	<code>\${_formatDateAdv}([date, format, year_offset, month_offset, day_offset, use_business_days, hour_offset, minute_offset])</code>

<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>date</code> 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.</li> <li><code>format</code> 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 <code>format</code> parameter, see <a href="http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html">http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html</a></li> <li><code>year_offset</code> Optional; +/- number of years to offset.</li> <li><code>month_offset</code> Optional; +/- number of months to offset.</li> <li><code>day_offset</code> Optional; +/- number of days to offset.</li> <li><code>use_business_days</code> Optional; Specification (<b>true</b> or <b>false</b>) for whether <code>day_offset</code> is for business days. Default is <b>false</b>.</li> <li><code>hour_offset</code> +/- number of hours to offset.</li> <li><code>minute_offset</code> +/- number of minutes to offset.</li> </ul>
<b>Examples</b>	<pre> \${_formatDateAdv} --&gt; 2012-08-24 15:55 \${_formatDateAdv()} --&gt; 2012-08-24 15:55 \${_formatDateAdv("","MMddyyyy",1)} --&gt; 08242013 \${_formatDateAdv("2012-09-01","",0,1)} --&gt; 2012-10-01 \${_formatDateAdv("2012-09-01","",0,-1)} --&gt; 2012-08-01 \${_formatDateAdv("2012-09-01","",0,0,5,false)} --&gt; 2012-09-06                     </pre>

## Return Day of Week


<b>Description</b>	Returns the day of week for the specified date as a number.
<b>Syntax</b>	<code>\${_dayOfWeek([date, first_dow, first_dow_value])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>date</code> Optional; Date in format yyyy-MM-dd. Default is the current date.</li> <li><code>first_dow</code> Optional; Specification for whether the week starts on Sunday or Monday. Values are <b>sun</b> and <b>mon</b> (not case-sensitive). Default is <b>sun</b>.</li> <li><code>first_dow_value</code> Optional; Starting value for the first day of week. Value must be a non-negative number. Default is <b>1</b>.</li> </ul>
<b>Example</b>	<pre> \${_dayOfWeek} --&gt; 6 \${_dayOfWeek()} --&gt; 6 \${_dayOfWeek("2012-07-04")} --&gt; 4 \${_dayOfWeek("2012-07-04","mon")} --&gt; 3                     </pre>

## Return Days between Dates


<b>Description</b>	<p>Returns the number of days between date1 and date2.</p> <ul style="list-style-type: none"> <li>If return value is &gt; 0, date2 is after date1.</li> <li>If return value is &lt; 0, date2 is before date1.</li> <li>If return value is 0, date1 is equal to date2.</li> </ul> <p>The start date is inclusive, but the end date is not.</p>
<b>Syntax</b>	<code>\${_daysBetween(date1, date2)}</code>

<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>date1</code> Required; First date in format yyyy-MM-dd.</li> <li>• <code>date2</code> Required; Second date in format yyyy-MM-dd.</li> </ul>
<b>Example</b>	<pre style="border: 1px solid #add8e6; padding: 5px;"> \${_daysBetween("2012-08-01","2012-09-01")} --&gt; 31</pre>

## Return Non-Business Day of Month

<b>Description</b>	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 <a href="#">Exclude Holidays for Business Days</a> Universal Controller system property.
<b>Syntax</b>	<code>\${_nonBusinessDayOfMonth(index, [date, format, reverse])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>index</code> Required; Nth non-business day of month.</li> <li>• <code>date</code> Optional; Date in format yyyy-MM-dd. If blank, defaults to the current date.</li> <li>• <code>format</code> Optional; Format of returned date. Default is yyyy-MM-dd. For details on the <code>format</code> parameter, see <a href="http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html">http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html</a></li> <li>• <code>reverse</code> Optional; Specification (<b>true</b> or <b>false</b>) for starting from the end of the month. Default is <b>false</b>.</li> </ul>
<b>Examples</b>	<pre style="border: 1px solid #add8e6; padding: 5px;"> \${_nonBusinessDayOfMonth(1)} --&gt; 2012-08-04 \${_nonBusinessDayOfMonth(1,"2012-09-01")} --&gt; 2012-09-01 \${_nonBusinessDayOfMonth(1,"2012-09-01","",true)} --&gt; 2012-09-30</pre>

## Return Nth Business Day of Month


<b>Description</b>	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 <a href="#">Exclude Holidays for Business Days</a> Universal Controller system property.
<b>Syntax</b>	<code>\${_businessDayOfMonth(index, [date, format, reverse])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>index</code> Required; Nth business day of month.</li> <li>• <code>date</code> Optional; Date in format yyyy-MM-dd. Default is the current date.</li> <li>• <code>format</code> Optional; Format of returned date. Default is yyyy-MM-dd. (For details on the <code>format</code> parameter, see <a href="http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html">http://docs.oracle.com/javase/6/docs/api/java/text/SimpleDateFormat.html</a>)</li> <li>• <code>reverse</code> Optional; Specification (<b>true</b> or <b>false</b>) for starting from the end of the month. Default is <b>false</b>.</li> </ul>

<b>Examples</b>	<pre> \${_businessDayOfMonth(1)} --&gt; 2012-08-01 \${_businessDayOfMonth(1,"2012-09-01")} --&gt; 2012-09-04 \${_businessDayOfMonth(1,"2012-09-01","",true)} --&gt; 2012-09-28                 </pre>
-----------------	---

## Return Nth Day of Month

<b>Description</b>	Returns the Nth day of month for the month of the date specified. Optionally, can start from the end of the month.
<b>Syntax</b>	<code>\${_dayOfMonth(index, [date, format, reverse])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <b>index</b> Required; Nth day of month.</li> <li>• <b>date</b> Optional; Date in format yyyy-MM-dd. Default is the current date.</li> <li>• <b>format</b> Optional; Format of returned date. Default is yyyy-MM-dd.</li> <li>• <b>reverse</b> Optional; Specification (<code>true</code> or <code>false</code>) for starting from the end of the month. Default is <code>false</code>.</li> </ul>
<b>Examples</b>	<pre> \${_dayOfMonth(5)} --&gt; 2012-08-05 \${_dayOfMonth(15,"2012-09-01","MM/dd/yyyy")} --&gt; 09/15/2012 \${_dayOfMonth(1,"2012-09-01","",true)} --&gt; 2012-09-30                 </pre>

## Return Number of Business Days between Dates

<b>Description</b>	<p>Returns the number of business days between date1 and date2.</p> <ul style="list-style-type: none"> <li>• If return value is &gt; 0, date2 is after date1.</li> <li>• If return value is &lt; 0, date2 is before date1.</li> <li>• If return value is 0, date1 is equal to date2.</li> </ul> <p>The start date is inclusive, but the end date is not.</p> <div style="background-color: #ffffcc; padding: 10px; border: 1px solid #ccc;"> <p> Whether a holiday is treated as a business day or a non-business day is specified by the <a href="#">Exclude Holidays for Business Days</a> Universal Controller system property.</p> </div>
<b>Syntax</b>	<code>\${_businessDaysBetween(date1, date2)}</code>
<b>Parameters</b>	<p>Parameters:</p> <ul style="list-style-type: none"> <li>• <b>date1</b> Required; First date in format yyyy-MM-dd.</li> <li>• <b>date2</b> Required; Second date in format yyyy-MM-dd.</li> </ul>
<b>Example</b>	<pre> \${_businessDaysBetween("2012-08-01","2012-09-01")} --&gt; 23                 </pre>

## Mathematical Functions

## Add

<b>Description</b>	Return the sum of the augend added with the addend.
<b>Syntax</b>	<code>\$_add(augend, addend)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>augend</code> Integer to which the addend is being added.</li> <li>• <code>addend</code> Integer being added to the augend.</li> </ul>
<b>Example</b>	<pre>\$_add("77", "33") --&gt; 110</pre> <p>Using Variables for augend and addend (<code>augend = 17</code>, <code>addend = 5</code>):</p> <pre>\$_add("\${augend}", "\${addend}") --&gt; 22</pre>

## Divide

<b>Description</b>	Return the quotient of the dividend divided by divisor.
<b>Syntax</b>	<code>\$_divide(dividend, divisor)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>dividend</code> Integer being divided by the divisor.</li> <li>• <code>divisor</code> Integer being used to divide the dividend.</li> </ul>
<b>Example</b>	<pre>\$_divide("7", "20") --&gt; 0 \$_divide("20", "7") --&gt; 2 \$_divide("20", "5") --&gt; 4</pre> <p>Using Variables for dividend and divisor (<code>dividend = 100</code>, <code>divisor = 5</code>)</p> <pre>\$_divide("\${dividend}", "\${divisor}") --&gt; 20</pre>

## Multiply

<b>Description</b>	Return the product of the multiplicand multiplied with the multiplier.
<b>Syntax</b>	<code>\$_multiply(multiplicand, multiplier)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>multiplicand</code> Integer being multiplied by the multiplier.</li> <li>• <code>multiplier</code> Integer being used to multiply the multiplicand.</li> </ul>



<b>Example</b>	<pre>\$_multiply("7", "20") --&gt; 140</pre> <p>Using Variables for multiplicand and multiplier (\${multiplicand} = 100, \${multiplier} = 5):</p> <pre>\$_multiply("\${multiplicand}", "\${multiplier}") --&gt; 500</pre>
----------------	---

## Return Absolute Value

<b>Description</b>	Return the <b>absolute value</b> of the parameter.
<b>Syntax</b>	<code>{_abs(parameter)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>parameter Integer (positive or negative value).</li> </ul>
<b>Example</b>	<pre>\$_abs("-1200") --&gt; 1200 \$_abs("1200") --&gt; 1200</pre> <p>Using Variables for parameter (\${parameter} = -100):</p> <pre>\$_abs("\${parameter}") --&gt; 100</pre>

## Return Modulo

<b>Description</b>	Return the modulo (remainder) of the dividend divided by divisor.
<b>Syntax</b>	<code>\$_mod(dividend, divisor)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>dividend Integer being divided by the divisor.</li> <li>divisor Integer being used to divide the dividend.</li> </ul>
<b>Example</b>	<pre>\$_mod("10", "2") --&gt; 0 \$_mod("10", "3") --&gt; 1 \$_mod("70", "65") --&gt; 5</pre> <p>Using Variables for dividend and divisor (\${dividend} = 23, \${divisor} = 5):</p> <pre>\$_mod("\${dividend}", "\${divisor}") --&gt; 3</pre>

## Subtract

<b>Description</b>	Return the difference of the subtrahend subtracted from the minuend.
<b>Syntax</b>	<code>\${_subtract(minuend, subtrahend)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>minuend</code> Integer from which the subtrahend is being subtracted.</li> <li>• <code>subtrahend</code> Integer being subtracted from the minuend.</li> </ul>
<b>Example</b>	<pre> \${_subtract("77","33")} --&gt; 44 \${_subtract("33","77")} --&gt; -44                     </pre> <p>Using Variables for minuend and subtrahend (<code>\${minuend} = 100</code>, <code>\${subtrahend} = 5</code>):</p> <pre> \${_add("\${minuend}","\${ subtrahend }")} --&gt; 95                     </pre>

## SQL/Stored Procedure Functions

### Return Column Names for SQL Results from Current Task

<b>Description</b>	Returns the column names for the SQL results from the current SQL or Stored Procedure task. Column names are separated by the specified <code>separator</code> .
<b>Syntax</b>	<code>\${_resultsColumnNames([separator])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>separator</code> Optional; Column name separator (default = comma).</li> </ul>
<b>Examples</b>	...

### Return Column Names for SQL Results from Sibling Task

<b>Description</b>	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 <code>separator</code> .
<b>Syntax</b>	<code>\${_resultsColumnNamesFromTask(name[, separator])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>name</code> Required; Name of the sibling task that the results should come from. The task must be within the same workflow.</li> <li>• <code>separator</code> Optional; Column name separator (default = comma).</li> </ul>
<b>Examples</b>	...

### Return SQL Results from Current Task

<b>Description</b>	Returns all SQL results from the current SQL or Stored Procedure task. Columns are separated by the specified <code>separator</code> and rows are separated by a new line.
--------------------	--

<b>Syntax</b>	<code>\${_resultsAll([separator, rowSeparator])}</code>
<b>Parameters</b>	Parameters: <ul style="list-style-type: none"> <li>• <code>separator</code> Optional; Column separator (default = comma).</li> <li>• <code>rowSeparator</code> Optional; Overrides default New Line character.</li> </ul>
<b>Example</b>	

## Return SQL Results from Sibling Task

<b>Description</b>	Returns all SQL results from a sibling SQL or Stored Procedure task, within the same workflow. Columns are separated by the specified <code>separator</code> and rows are separated by a new line.
<b>Syntax</b>	<code>\${_resultsAllFromTask(name[, separator, rowSeparator])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>name</code> Required; Name of the sibling task that the results should come from. The task must be within the same workflow.</li> <li>• <code>separator</code> Optional; Column separator (default = comma).</li> <li>• <code>rowSeparator</code> Optional; Overrides default New Line character.</li> </ul>
<b>Example</b>	...

## Return SQL Warnings from Current Task

<b>Description</b>	Returns all SQL warnings from the current SQL or Stored Procedure task. Columns are separated by the specified <code>separator</code> and rows are separated by a new line.
<b>Syntax</b>	<code>\${_SQLWarnings([separator])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>separator</code> Optional; Column separator (default = comma).</li> </ul>
<b>Example</b>	...

## Return SQL Warnings from Sibling Task

<b>Description</b>	Returns all SQL warnings from a sibling SQL or Stored Procedure task, within the same workflow. Columns are separated by the specified <code>separator</code> and rows are separated by a new line.
<b>Syntax</b>	<code>\${_SQLWarningsFromTask(name[, separator])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>name</code> Required; Name of the sibling task that the warnings should come from. The task must be within the same workflow.</li> <li>• <code>separator</code> Optional; Column separator (default = comma).</li> </ul>
<b>Example</b>	...

## Return String Value of Row/Column by Column Name

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

<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>name</code> 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.</li> <li>• <code>colname</code> Required; Name of column to retrieve.</li> <li>• <code>rownum</code> Optional; Numeric row number in result set to retrieve (default = 1).</li> <li>• <code>default_value</code> Optional; Default value to return if result not found.</li> </ul>
<b>Example</b>	...

## Return String Value of Row/Column by Column Number

<b>Description</b>	Returns the string value of a row/column from a previously executed SQL task within the same workflow, or from the current SQL task.
<b>Syntax</b>	<code>\${_resultsColumnByNo(name, colnum[, rownum, default_value])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>name</code> 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.</li> <li>• <code>colnum</code> Required; Number of column to retrieve. First column in result is 1, second is 2, and so on.</li> <li>• <code>rownum</code> Optional; Numeric row number in result set to retrieve (default = 1).</li> <li>• <code>default_value</code> Optional; Default value to return if result not found.</li> </ul>
<b>Example</b>	...

## Return String Values of Columns

<b>Description</b>	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.
<b>Syntax</b>	<code>\${_resultsColumnsCSV(name[, rownum])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>name</code> 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 <code>name</code> parameter.</li> <li>• <code>rownum</code> Optional; Numeric row number in result set to retrieve (default = 1).</li> </ul>
<b>Example</b>	...

## String Functions

All String functions accept either a String value parameter or a variable name parameter; those that accept a variable name parameter are prefixed with `_var`.

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.

In the **Syntax** for each of the following String functions, you can click the name of the function to toggle between the **Syntax** for the function that accepts a String value parameter and the **Syntax** for the corresponding function that accepts a variable name parameter.



**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

<b>Description</b>	Converts all of the characters in the <code>value</code> to lower case using the rules of the default locale.
<b>Syntax</b>	<code>\$_toLowerCase(value)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; String to convert to lower case.</li> </ul>
<b>Example</b>	...

## Convert Characters in Value to Upper Case

<b>Description</b>	Converts all of the characters in the <code>value</code> to upper case using the rules of the default locale.
<b>Syntax</b>	<code>\$_toUpperCase(value)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; String to convert to upper case.</li> </ul>
<b>Example</b>	...

## Convert Characters in Variable to Lower Case

<b>Description</b>	Converts all of the characters in the <code>variable</code> to lower case using the rules of the default locale.
--------------------	--

<b>Syntax</b>	<code>\$_varToLowerCase(variableName)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> </ul>
<b>Example</b>	...

## Convert Characters in Variable to Upper Case

<b>Description</b>	Converts all of the characters in the variable to upper case using the rules of the default locale.
<b>Syntax</b>	<code>\$_varToUpperCase(variableName)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> </ul>
<b>Example</b>	...

## Replace Substring of Value with Regular Expression

<b>Description</b>	Replaces each substring of value that matches the specified regular expression, <code>regex</code> , with the specified replacement.
<b>Syntax</b>	<code>\$_replaceAll(value, regex, replacement)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; Input string.</li> <li><code>regex</code> Required; Regular expression.</li> <li><code>replacement</code> Required; Replacement string.</li> </ul>
<b>Example</b>	

## Replace Substring of Variable with Regular Expression

<b>Description</b>	Replaces each substring of <code>variableName</code> that matches the specified regular expression, <code>regex</code> , with the specified replacement.
<b>Syntax</b>	<code>\$_varReplaceAll(variableName, regex, replacement)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> <li><code>regex</code> Required; Regular expression.</li> <li><code>replacement</code> Required; Replacement string.</li> </ul>
<b>Example</b>	...

## Return Copy of Value with Whitespace Omitted

<b>Description</b>	Returns a copy of <code>value</code> , with leading and trailing whitespace omitted.
<b>Syntax</b>	<code>\$_trim(value)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; String to trim.</li> </ul>

<b>Example</b>	...
----------------	-----

## Return Copy of Variable with Whitespace Omitted

<b>Description</b>	Returns a copy of <code>variableName</code> , with leading and trailing whitespace omitted.
<b>Syntax</b>	<code>\${_varTrim(variableName)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> </ul>
<b>Example</b>	...

## Return Index of Substring in String Value

<b>Description</b>	Returns the index within the string value of the first occurrence of the specified substring, <code>str</code> .
<b>Syntax</b>	<code>\${_indexOf(value, str)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Any string.</li> <li><code>str</code> Substring to search for. If the <code>str</code> 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.</li> </ul>
<b>Example</b>	...

## Return Index of Substring in String Variable

<b>Description</b>	Returns the index within the string variable of the first occurrence of the specified substring, <code>str</code> .
<b>Syntax</b>	<code>\${_varIndexOf(variableName, str)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> <li><code>str</code> Required; Substring to search for. If the <code>str</code> 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.</li> </ul>
<b>Example</b>	...

## Return Index of Substring Plus Offset in String Value

<b>Description</b>	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.
<b>Syntax</b>	<code>\${_indexOfWithOffset(value, str, offset)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; Any string.</li> <li><code>str</code> Required; Substring to search for. If the <code>str</code> 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.</li> <li><code>offset</code> Required; Number (positive or negative) to offset the found index.</li> </ul>
<b>Example</b>	...

## Return Index of Substring Plus Offset in String Variable

<b>Description</b>	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.
<b>Syntax</b>	<code>\$_varIndexOfWithOffset(variableName, str, offset)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> <li><code>str</code> Required; Substring to search for. If the <code>str</code> 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.</li> <li><code>offset</code> Required; Number (positive or negative) to offset the found index.</li> </ul>
<b>Example</b>	...

## Return Index of Rightmost Occurrence of Substring in String Value

<b>Description</b>	Returns the index within the string value of the rightmost occurrence of the specified substring, <code>str</code> .
<b>Syntax</b>	<code>\$_lastIndexOf(value, str)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; Any string.</li> <li><code>str</code> Required; Substring to search for. If the <code>str</code> 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.</li> </ul>
<b>Example</b>	...

## Return Index of Rightmost Occurrence of Substring in String Variable

<b>Description</b>	Returns the index within the string variable of the rightmost occurrence of the specified substring, <code>str</code> .
<b>Syntax</b>	<code>\$_varLastIndexOf(variableName, str)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> <li><code>str</code> Required; Substring to search for. If the <code>str</code> 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.</li> </ul>
<b>Example</b>	...

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

<b>Description</b>	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.
<b>Syntax</b>	<code>\$_lastIndexOfWithOffset(value, str, offset)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; Any string.</li> <li><code>str</code> Required; Substring to search for. If the <code>str</code> 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.</li> <li><code>offset</code> Required; Number (positive or negative) to offset the found index.</li> </ul>



<b>Example</b>	...
----------------	-----

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

<b>Description</b>	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.
<b>Syntax</b>	<code>\$_varLastIndexOfWithOffset(variableName, str, offset)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> <li><code>str</code> Required; Substring to search for. If the <code>str</code> 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.</li> <li><code>offset</code> Required; Number (positive or negative) to offset the found index.</li> </ul>
<b>Example</b>	...

## Return Length of Value

<b>Description</b>	Returns the length of <code>value</code> .
<b>Syntax</b>	<code>\$_length(value)</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; Any string.</li> </ul>
<b>Example</b>	...

## Return Length of Variable

<b>Description</b>	Returns the length of <code>variableName</code> .
<b>Syntax</b>	<code>\$_varLength(variableName[, useEmptyForUndefined])</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> <li><code>useEmptyForUndefined</code> Optional; Specification (<b>true</b> or <b>false</b>) for the handling of a missing variable name. Default is <b>false</b>. <ul style="list-style-type: none"> <li>If <code>useEmptyForUndefined = true</code>, the function will return 0.</li> <li>If <code>useEmptyForUndefined = false</code>, the function will remain unresolved if the variable name does not exist.</li> </ul> </li> </ul>
<b>Example</b>	...

## Return New String that is Substring of Value

<b>Description</b>	Returns a new string that is a substring of <code>value</code> . The substring begins at <code>begin_index</code> and extends to the character at <code>end_index - 1</code> .
<b>Syntax</b>	<code>\$_substring(value, begin_index[, end_index])</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>value</code> Required; String to make a substring from.</li> <li><code>begin_index</code> Required; Beginning index, inclusive.</li> <li><code>end_index</code> Optional; Ending index, exclusive.</li> </ul>

<b>Example</b>	<pre> \${_substring("hamburger", 4, 8)}   resolves to "urge". \${_substring("smiles", 1, 5)}   resolves to "mile".         </pre>
----------------	---

## Return New String that is Substring of Variable

<b>Description</b>	Returns a new string that is a substring of <code>variableName</code> . The substring begins at <code>begin_index</code> and extends to the character at <code>{end_index}-1</code> .
<b>Syntax</b>	<code>\${_varSubstring(variableName, beginIndex, endIndex)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li><code>variableName</code> Required; Variable that this function is passing in.</li> <li><code>begin_index</code> Required; Beginning index, inclusive.</li> <li><code>end_index</code> Required; Ending index, exclusive.</li> </ul>
<b>Examples</b>	<pre> \${_substring("hamburger", 4, 8)}   resolves to "urge". \${_substring("smiles", 1, 5)}   resolves to "mile".         </pre>

## System Functions

### Display Variables

<b>Description</b>	Displays all the defined and built-in variables associated with the task instance.
<b>Syntax</b>	<code>\${_scope}</code>
<b>Parameters</b>	(none)
<b>Example</b>	<pre> \${_scope} --&gt; {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=84880af243d26172019aald25988a8f9, ops_task_name=Opwise - Linux Ls}         </pre>

### Generate Random Number

<b>Description</b>	Generates a random number between <code>max</code> (inclusive) and <code>min</code> (inclusive)
<b>Syntax</b>	<code>\${_random([max, min])}</code>

<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>max</code> Optional; Upper bound (inclusive) on the random number (default = 9).</li> <li>• <code>min</code> Optional; Lower bound (inclusive) on the random number (default = 0).</li> </ul>
<b>Example</b>	...

## Resolve to GUID (Globally Unique ID)

<b>Description</b>	Resolves to a 32-byte GUID (Globally Unique ID).
<b>Syntax</b>	<code>\${_guid}</code>
<b>Parameters</b>	(none)
<b>Example</b>	...

## Resolve to Host Name

<b>Description</b>	Resolves to the hostname of the machine running the Controller, if available.
<b>Syntax</b>	<code>\${_hostname}</code>
<b>Parameters</b>	(none)
<b>Example</b>	...

## Resolve to IP Address

<b>Description</b>	Resolves to the IP address of the machine running the Controller.
<b>Syntax</b>	<code>\${_ipaddress}</code>
<b>Parameters</b>	(none)
<b>Example</b>	...

## Resolve to SYS\_ID

<b>Description</b>	Resolves to the <code>sys_id</code> of the first task instance found within the same workflow specified by the sibling name.
<b>Syntax</b>	<code>\${_siblingid(sibling_name)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>sibling_name</code> Required; Sibling name.</li> </ul>
<b>Example</b>	<pre> \${_siblingid("Timer 60")} --&gt; 5dbaaab943d26172015e10ab3e894e10                     </pre>

## Resolve to Variable Value

<b>Description</b>	Locates the specified variable in the specified sibling task instance within the same workflow and resolves to the variable value.
<b>Syntax</b>	<code>\${_varLookup(sibling_name, variable_name[,def])}</code>

<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>sibling_name</code> Required; Name of the sibling task instance from which the function is collecting the variable value.</li> <li>• <code>variable_name</code> Required; Name of the variable being collected by the function.</li> <li>• <code>def</code> Optional; default value to return if the variable is not defined in the sibling task instance.</li> </ul>
<b>Example</b>	...

## Resolve Variable

<b>Description</b>	Resolves the variable specified by the <code>variable_name</code> parameter and substitutes the <code>default_value</code> if the variable cannot be resolved.
<b>Syntax</b>	<code>\${_resolve(variable_name, default_value)}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>variable_name</code> Required; Variable name.</li> <li>• <code>default_value</code> Required; Default value to use if the variable cannot be resolved.</li> </ul>
<b>Example</b>	...

## Resolve Variable (Advanced)

<b>Description</b>	Resolves the variable specified by the <code>variable_name</code> parameter and substitutes the default value if the variable cannot be resolved.
<b>Syntax</b>	<code>\${_resolveadv(variable_name, default_value, [use_default_if_blank])}</code>
<b>Parameters</b>	<ul style="list-style-type: none"> <li>• <code>variable_name</code> Required; Variable name.</li> <li>• <code>default_value</code> Required; Default value to use if the variable cannot be resolved.</li> <li>• <code>use_default_if_blank</code> Optional; Specification (<b>true</b> or <b>false</b>) for whether or not to use the default value if the variable is empty or blank. (If <code>use_default_if_blank</code> is <b>false</b>, <code>_resolveadv</code> behaves like <code>_resolve</code>.)</li> </ul>
<b>Example</b>	...