Universal Controller 7.0.x

Administration

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Ports Configuration

The information on these pages also is located in the Universal Controller 7.0.x Administration.pdf.

Administration Overview

Universal Controller Administration

Administration of Universal Controller includes:

High Availability	Configuration of Universal Automation Center system as a redundant (multiple Universal Controller cluster node) system.
Ports Configuration	Configuration of ports for Universal Controller components and prerequisites.
Universal Controller Start-Up Properties	These properties are required for Controller start-up, initialization, and operation. They are contained in the **`uc.properties`** file and have their values set during installation. To reset the values, you must stop the Controller, edit **`uc.properties`**, and restart the Controller.
Universal Controller System Properties	These properties define Controller system information and performance. They have their values set during installation. They are available, and can be reset, only via the user interface.
LDAP Settings	These settings enable you to enable the LDAP bridge. They have their values set only via the user interface; they are not set at installation.
Universal Command Line Interface (CLI) Properties	CLI provides a sample configuration file, `cmdtools.props`, that you can use to pass CLI Global parameters to a CLI command. The file is created during installation of Universal Agent if the Universal Controller Command Line Interface has been selected to be installed.
Universal Templates	Creation of Universal Templates, on which Universal Tasks are based.
Data Backup/Purge	Configuration of automatic backups and/or purges of some or all of the Controller activity data.
Server Operations	Universal Controller server operations help you maintain and administer your Controller installation. Many of these operations should be run only by Technical Support or upon request by Technical Support.
Filters	Creation and application of filters to record lists throughout the Universal Controller user interface.
Security	Creation of Universal Controller users and user groups and the roles and permissions that can be assigned to them; Business Services that group Controller records into logical groups; and audits of all user interaction with the Controller.

High Availability

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Introduction

High Availability (HA) of Universal Automation Center means that it has been set up to be a redundant system; in addition to the components that are processing work, there are back-up components available to continue processing through hardware or software failure.

This page describes a High Availability environment, how High Availability components recover in the event of such a failure, and what actions, if any, the user must take.

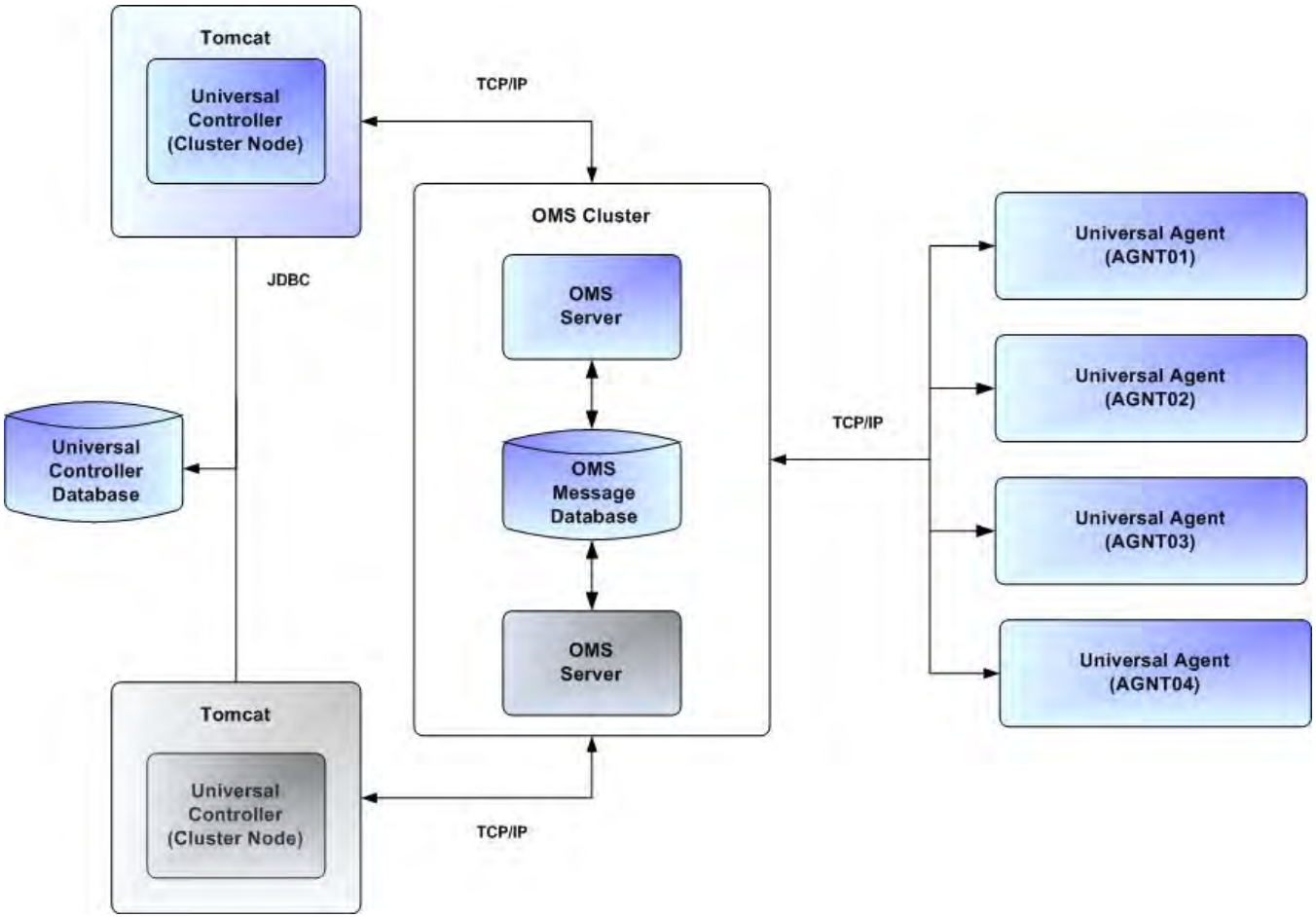
High Availability System

The following illustration is a typical, although simplified, Universal Automation Center system in a High Availability environment.

In this environment, there are:

- Two Universal Controller instances (cluster nodes)
- Two Universal Message Service (OMS) network communications providers in an OMS cluster
- Four Universal Agent (Agent) machines

The components in blue are active and operating. The components in gray are available for operations but currently are inactive (passive).



See High Availability Components for a detailed description of how each component type functions in a High Availability environment.

High Availability Components

This section provides detailed information on the cluster nodes and Agents in a High Availability environment.

Cluster Nodes

Each Universal Automation Center installation consists of one or more instances of Universal Controller; each instance is a cluster node. Only one node is required in a Universal Automation Center system; however, in order to run a High Availability configuration, you must run at least two nodes.

At any given time under High Availability, one node operates in Active mode and the remaining nodes operate in Passive mode (see Determining Mode of a Cluster Node at Start-up).

An Active node performs all system processing functions; Passive nodes can perform limited processing functions.

Passive Cluster Node Restrictions

Passive cluster nodes cannot execute any automated or scheduled work.

Also, from a Passive node you cannot:

- Perform a workflow instance insert task operation.
- Perform a bulk import or list import.
- Run the LDAP Refresh server operation.
- Update a task instance.
- Update or delete an enabled trigger.
- Update an enabled Data Backup/Purge.
- Update the Task Execution Limit field in Agent records.
- Update the Task Execution Limit field and Distribution field in Agent Cluster records.
- Update the user Time Zone.
- List Composite Trigger component events.

However, Passive nodes do let you perform a limited number of processing functions, such as:

- Launch tasks.
- Monitor and display data.
- Access the database.
- Generate reports.

Agent

The Agent runs as a Windows service or Linux/Unix daemon. A cluster node sends a request to the Agent to perform a function. The Agent processes the request, gathers data about the operation of the client machine, and sends status and results back to the node. It performs these functions by exchanging messages with the node.

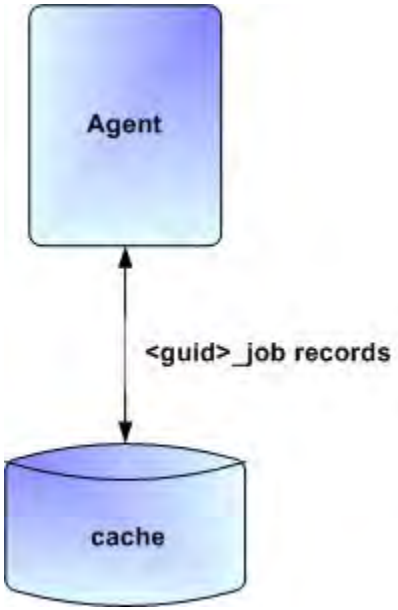
Once an Agent has registered with a node, you can view it by selecting that Agent type from the Agents & Connections navigation pane of the user interface. A list displays showing all the registered Agents of that type. See Agents for more information.

If an Agent fails, Universal Broker restarts it. The Agent then attempts to determine what tasks or functions were in process at the time of failure.

In order to support such a determination, Agent task processing includes the following steps:

Step 1	Each time the Agent receives a task, it writes to cache a record called **`[guid]_job`**, where **`[guid]`** is a unique tracking number assigned to the task instance.
Step 2	As the task runs, the Agent updates the **`[guid]_job`** record with status information.
Step 3	When the task run completes, the Agent deletes the **`[guid]_job`** record.
Step 4	If an Agent is restarted, it looks in the cache for **`[guid]_job`** records. If any are found, the Agent looks at the status. If the record indicates that the job is supposed to be running, the Agent searches the system to locate it. If the Agent is able to locate the task and resume tracking, it continues and marks the task resumed. If the Agent is not able to resume tracking a task, it returns a message to the cluster node, setting the status of the task instance to **IN-DOUBT**. This then requires manual follow-up to determine the state of the process.

As illustrated below, the Agent reads/writes a record to its agent/cache directory for each task instance that it manages.



Universal Message Service (OMS)

Universal Message Service (OMS) sends and receives messages between the cluster nodes and Agents.

OMS consists of an OMS Server and an OMS Administration Utility. The OMS clients - cluster nodes and Agents - establish persistent TCP/IP socket connections with the OMS Server.

OMS provides for reliable message communication by persisting all OMS queued messages to persistent storage. The OMS Server maintains OMS queues in an OMS message database that resides on persistent storage.

See Universal Message Service (OMS) for detailed information on OMS.

How High Availability Works

In a High Availability environment, passive cluster nodes play the role of standby servers to the active (primary) cluster nodes server. All running cluster nodes issue heartbeats and check the mode (status) of other running cluster nodes, both when they start up and continuously during operations. If a cluster node that currently is processing work can no longer do so, one of the other cluster nodes will take over and continue processing.

Each cluster node connects to the same Universal Controller database; however, only the Active cluster node connects to the configured OMS HA cluster. Likewise, each Agent connects to the same OMS HA cluster.

A Universal Controller HA configuration can use a single OMS server, that is not an HA cluster, with the understanding that a single OMS server would introduce a single point of failure. Using an OMS HA cluster is recommended.

See High Availability Configuration for information on how these connections are made.

Cluster Node Mode

The mode (status) of a cluster node indicates whether or not it is the cluster node that currently is processing work:

Active	Cluster node currently is performing all system processing functions.
Passive	Cluster Node is not connected to OMS but is available to perform all system processing functions, except that it would not be able to exchange data with an Agent.
Offline	Cluster node is not running or is inoperable and needs to be restarted.

Note

Cluster nodes in Passive mode can perform limited system processing functions.

High Availability Start-Up

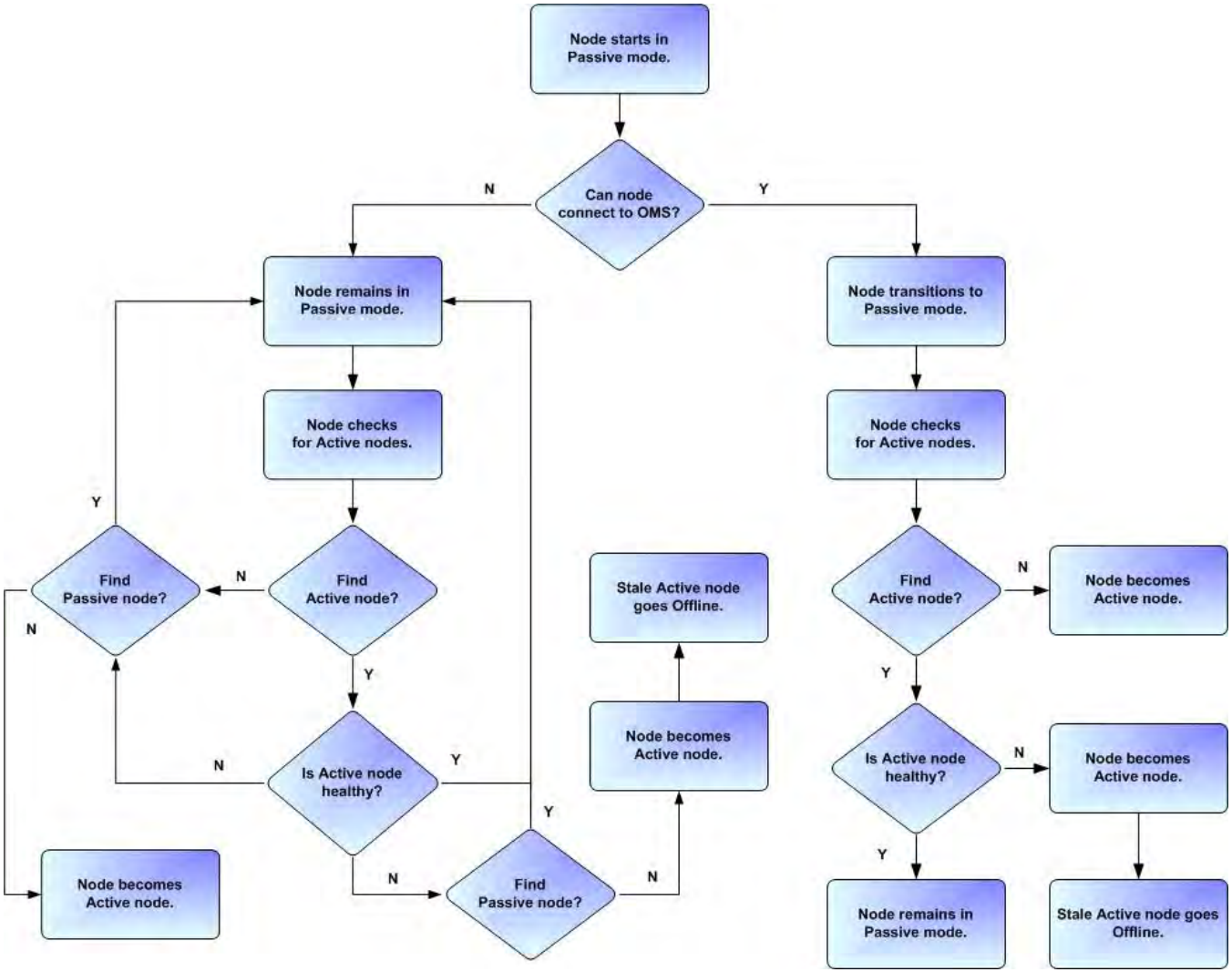
The following steps describe how a High Availability environment starts up:

Step 1	User starts the Cluster Nodes.
Step 2	Each cluster node reads its `uc.properties` file.
Step 3	Each cluster node locates and connects to the database and retrieves information about the Universal Automation Center environment.
Step 4	Each cluster node connects to an OMS server.
Step 5	Each Agent connects to an OMS server.

Determining Mode of a Cluster Node at Start-up

A cluster node starts in Passive mode. It then determines if it should remain in Passive mode or switch to Active mode.

The following flow chart describes how a cluster node determines its mode at start-up:



Note

A cluster node is considered "healthy" or "stale" based on its heartbeat timestamp.

Checking the Active Cluster Node During Operations

When all cluster nodes have started, each one continuously monitors the heartbeats of the other running cluster nodes.

If a Passive cluster node determines that the Active cluster node is no longer running, the Passive cluster node automatically takes over as the Active cluster node based upon the same criteria described above.

This determination is made as follows:

Step 1	The Active cluster node sends a heartbeat by updating a timestamp in the database. The heartbeat interval is 10 (seconds).
Step 2	All Passive cluster nodes check the Active cluster node's timestamp to determine if it is current. (This check runs every 60 seconds.)
Step 3	If a Passive cluster node determines that the Active cluster node's timestamp is stale, failover occurs: the Passive cluster node changes the mode of the Active cluster node to Offline and takes over as the Active cluster node. If more than one cluster node is operating in Passive mode, the first cluster node eligible to become Active that determines that the Active cluster node is not running becomes the Active cluster node. A stale cluster node is one whose timestamp is older than 5 minutes.

Checking OMS Connectivity During Operations

When a cluster node is not processing work, it is possible that its OMS Server connection can be silently dropped.

To detect this, a cluster node issues a heartbeat through the OMS server, and back to itself, every 30 seconds if no outgoing activity to the OMS server has occurred. The difference between the time the Controller issues the heartbeat and the time it receives the heartbeat is logged in the **uc.log**.

What To Do If a Failover Occurs

A Passive cluster node taking over as an Active cluster node is referred to as failover. If failover occurs, the event is invisible unless you are using the Active cluster node in a browser.

If you are using the Active cluster node in a browser and the cluster node fails, you will receive a browser error. In this case, take the following steps to continue working:

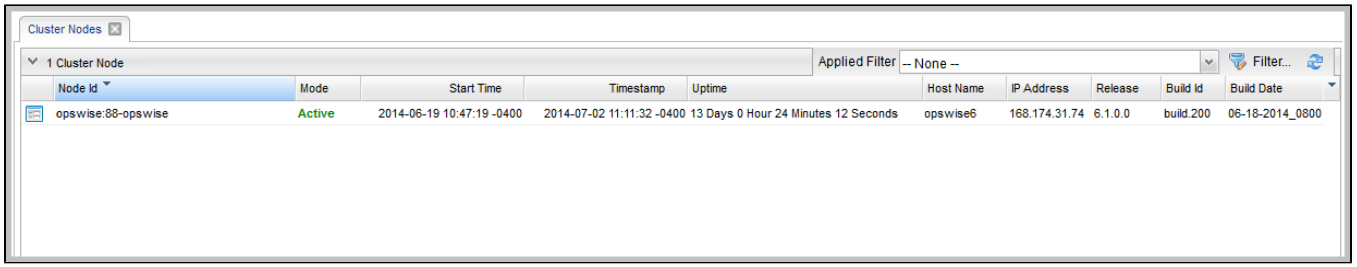
Step 1	Access the new Active cluster node in your browser. To determine which cluster node is now Active, check the **Mode** column on the Cluster Nodes list in the user interface (see Viewing Cluster Node Status, below).
Step 2	If you were adding, deleting, or updating records at the time of the failure, check the record you were working on. Any data you had not yet saved will be lost.

Note

Running the Pause Cluster Node Server Operation does not induce a failover event. You cannot pause an Active cluster node to create a failover to a Passive cluster node.

Viewing Cluster Node Status

To view a list of all cluster nodes, from the Agents & Connections navigation pane select **System > Cluster Nodes**. The Cluster Nodes list identifies all registered cluster nodes. The **Mode** column on the list identifies the current mode (status) of all cluster nodes.



Note

A cluster node becomes registered the first time it starts. From then on, it always appears in the Cluster Nodes list, regardless of its current mode.

Click any cluster node on the list to display Details for that cluster node below the list. (See Cluster Nodes for a description of the fields in the Details.)

High Availability Configuration

To achieve High Availability for your Universal Automation Center system, you must configure the cluster nodes, OMS, and Agents.

Configuring Cluster Nodes

All cluster nodes in a High Availability environment must point to the same database by making sure the following entries in their `uc.properties` files are the same.

For example:

```
uc.db.name=uc
uc.db.rdbms=mysql
uc.db.url=jdbc:mysql://10.10.1.1/
```

Configuring OMS

OMS HA cluster configuration is described in the OMS Reference Guide.

The Universal Controller OMS Server definitions specify an OMS HA cluster as an ordered, comma-separated list of OMS Server addresses, one for each member of the OMS HA cluster.

OMS configuration

Do not define multiple OMS Server records for individual OMS HA cluster members. An OMS HA cluster must be defined as a single OMS Server record with an OMS address list containing each OMS HA cluster member.

As an example, if an OMS HA cluster contains three OMS Servers, `oms1.acme.com`, `oms2.acme.com`, and `oms3.acme.com`, the Universal Controller OMS Server definition would be defined with an OMS Server address value of `oms1.acme.com,oms2.acme.com,oms3.acme.com`.

Configuring Agents

If you want to configure an Agent to be able to access an OMS HA cluster, you must configure the Universal Automation Center Agent (UAG) OMS_SERVERS configuration option.

Configuring Notifications Based on Component Status

You can configure the Controller to generate Email Notifications or SNMP Notifications based on the mode of your cluster nodes, OMS Servers, and Agents.

Load Balancer

If you are using a load balancer in your High Availability environment, it can utilize the following HTTP requests:

http(s)://serverhost:[Port]/uc/is_active_node.do	If a cluster node is active, this URL returns the status **200** (OK) and a simple one word content of **ACTIVE**. If a cluster node is not active, this URL returns the status **403** (cluster node is not active) and lists the actual mode of the cluster node: **PASSIVE** or **OFFLINE**.
http(s)://serverhost:[Port]/uc/ops_node_info.do	This URL returns information about a cluster node: • Node: serverhost.com:8080-uc • Release: 6.1.1.0* • Build Id: 10-10-2014_1129 • Mode: Active • Host Name: serverhost.com • Host IP: 192.168.50.50 • Uptime: 7 Days 3 Hours 22 Minutes 37 Seconds

Ports Configuration

Ports Configuration

Ports configured for Universal Controller 7.0.x components and prerequisites cannot be blocked by a firewall.

The following table identifies the default ports, which you can change during installation or configuration:

Component or Prerequisite	Default Port
MySQL	3306
Microsoft SQL Server	1433
Oracle	1521
Universal Controller (Tomcat)	8080
Universal Message Service (OMS)	7878

Universal Controller Properties

- Overview
- Universal Controller Start-up Properties (uc.properties)
  - Sample uc.properties File
- Universal Controller System Properties
  - Overriding Universal Controller System Properties
- Command Line Interface (CLI) Properties

Overview

Universal Controller contains three types of configurable properties:

Universal Controller Start-up Properties (uc.properties)	Universal Controller start-up properties are the default properties contained in the uc.properties file when the Controller is installed. These properties are required for Controller start-up and operation. The values for these properties are set during the installation process. Some of the values are based on information that you provide during the installation. You can reset these properties by stopping the Controller, editing uc.properties, and restarting the Controller. The changes will take effect after the restart (see Starting and Stopping Universal Controller).
Universal Controller System Properties	Universal Controller system properties define Controller system information and performance. They have their values set during installation. You can reset these properties at any time, without having to stop the Controller, via the user interface. Note In a High Availability environment, all Universal Controller cluster nodes share the same database; therefore, updating Universal Controller System Properties for one cluster node applies to all cluster nodes.
Command Line Interface (CLI) Properties	CLI provides a sample configuration file, `cmdtools.props`, that you can use to pass CLI Global parameters to a CLI command.

Note

Properties for Universal Message Service (OMS) are installed as configuration file options when OMS is installed as a component of Universal Agent. The values for these options are set during the installation. There are several configuration methods available for changing these values.

Universal Controller Start-up Properties (uc.properties)

The **`uc.properties`** file is read by the Controller, which is started by Tomcat.

The **`uc.properties`** file resides here:

```
[tomcat directory]\conf
```

Note

The backslash character in a property value must be escaped as a double backslash.

For example:example.path=c:\\stonebranch\\uc

Property Name	Description	Default
For MySQL:		

`uc.db.mysql.character_encoding`	Allows the retrieval of output with extended unicode characters. If the property is not set, character encoding will not be used in the JDBC URL.
	
	Examples:
	`uc.db.mysql.character_encoding=US-ASCII`
	`uc.db.mysql.character_encoding=Cp1252`
	`uc.db.mysql.character_encoding=UTF-8`	

`uc.db.rdbms=mysql`	Database type. Specify this property if you are using a MySQL database.	
`uc.db.url=jdbc:mysql://localhost/`	JDBC connect URL. Specify this property if you are using a MySQL database.	
For SQLServer		
`uc.db.rdbms=sqlserver`	Database type. Specify this property if you are using a SQLServer database.	
`uc.db.url=jdbc:sqlserver://localhost:1433;DatabaseName=uc`	JDBC connect URL. Specify this property if you are using a SQLServer database.	

For Oracle		
`uc.db.rdbms=oracle`	Database type. Specify this property if you are using an Oracle database.	
`uc.db.url=jdbc:oracle:thin:@//localhost:1521/@oracle.db.name@`	JDBC connect URL. Specify this property if you are using an Oracle database.	
For All Databases		
`uc.db.name`	IMPORTANT If you specify a database name in this property and in **uc.db.url**, the names must be the same. Name for the Controller database.	uc
`uc.db.password`	Database password that will be replaced by **`uc.db.password.encrypted`** in the **`uc.properties`** file upon start-up.	(none)
`uc.db.password.encrypted`	Encrypted version of **`uc.db.password`** that will replace **`uc.db.password`** in the **`uc.properties`** file upon start-up.	(none)
`uc.db.pooler.connections`	Sets the minimum number of idle connections to maintain in the Server connection pool, or zero to create none. The Server connection pool is used by all internal database transactions.	1

`uc.db.pooler.connections.Client`	Sets the minimum number of idle connections to maintain in the Client connection pool, or zero to create none. The Client connection pool is used by all user interface related database transactions.	1
`uc.db.pooler.connections.max`	Sets the maximum number of connections that can be allocated by the Server connection pool at a given time. The Server connection pool is used by all internal database transactions. Note The installer overrides the default by configuring a maximum number of 40 in the **`uc.properties`** file.	30
`uc.db.pooler.connections.max.Client`	Sets the maximum number of connections that can be allocated by the Client connection pool at a given time. The Client connection pool is used by all user interface related database transactions.	30
`uc.db.pooler.connections.max.Reserved`	Sets the maximum number of connections that can be allocated by the Reserved connection pool at a given time. The Reserved connection pool is used by all critical internal database transactions.	30
`uc.db.pooler.connections.Reserved`	Sets the minimum number of idle connections to maintain in the Reserved connection pool, or zero to create none. The Reserved connection pool is used by all critical internal database transactions.	1
`uc.db.url.append.properties`	Allows additional options to be appended to the JDBC URL generated by Universal Controller. Example: `uc.db.url.append.properties=&verifyServerCertificate=false&useSSL=true`	(none)

`uc.db.user`	Login ID that the Controller will use to log in to your database.	root
For LDAP:		
`uc.ldap.groups.filter_indirect`	When this property is set to true, any Groups synchronized indirectly (that is, through a User's **memberOf** attribute) will honor the Group search filter and Group OU filters under the LDAP Advanced Settings section. Note The code default for this property, which is used if this property is not set, is false.	true
`uc.ldap.groups.single_parent_per_child`	IMPORTANT This property should be set to true only if your Groups being synchronized from AD have at most one parent Group. When synchronizing Groups, the default behavior in the Controller is to copy the members of a Sub Group into the Parent Group. When this property is set to true, the Controller assumes that each Group has, at most, a single Parent Group and will use the Parent field on the Group definition to maintain the hierarchy instead of copying members.	false
`uc.ldap.groups.update_members`	IMPORTANT This property should be set to false only when synchronizing Groups from AD, and the number of values for the **member** attribute exceeds the `MaxValRange` LDAP policy (and the `MaxValRange` cannot be increased). When synchronizing Groups, the default behavior in the Controller is to use the multi-valued **member** attribute to update the members for a Group; however, AD limits the number of values returned for an attribute, which can result in Group members being removed unexpectedly. This limit is determined by the `MaxValRange` LDAP policy (typically 1,500). When this property is set to false, the Controller will not use the **member** attribute values to update members when synchronizing Groups from AD. Group membership will continue to be updated based on the **memberOf** attribute values when synchronizing Users from AD.	true
`uc.ldap.users.synchronize_by_range`	IMPORTANT This property should be set to false only if your LDAP server supports paged results. When synchronizing Users, the default behaviour in the Controller is to search based on ranges, using a filter like (&(uid>=a)(uid<=b)). To use the <= or >= operators in a filter, an ordering rule must be defined for the attribute in the LDAP schema. OpenLDAP's schema does not define an ordering rule for the User Id Attribute (for example, **uid**), so searches using filters like the above do not return any results. When this property is set to false, the Controller will not search based on ranges when synchronizing Users.	true

`uc.ldap.users.synchronize_indirect`	IMPORTANT This property should be set to true only if your LDAP server does not support the User Membership Attribute (for example, **memberOf**). Synchronizes LDAP users indirectly based on group membership. This only applies to groups that users are direct members of. When this property is set to true, the following will apply for the LDAP refresh (scheduled and server operations): • Users will not be synchronized directly based on the User Filter and User Target OU List. • Groups will continue to be synchronized directly based on the Group Filter and Group Target OU List. • For each matching group, the Group Member Attribute (for example, **member**) will be used to synchronize users matching the User Filter and User Target OU List Note The **`uc.ldap.groups.update_members`** property will be ignored when indirect user synchronization is enabled. Note There is currently no support for nested groups if the User Membership Attribute is not supported by the LDAP server.	false
`uc.ldap.users.update_memberships_on_login`	IMPORTANT This property should ***not*** be set to true if group membership for users is static, since there is extra overhead to process the groups, which may impact login performance. When this property is set to true, LDAP group memberships for existing LDAP users are updated upon successful login. Note When dynamically creating a new LDAP user at login, the user will be added only to groups that it is a direct member of. Likewise, when updating an existing LDAP user at login, the user will be removed from any groups that it is not a direct member of. Therefore, it is not recommended that you enable this property if a group hierarchy exists, since the user will be removed from any parent groups when logging in. (Group membership for the parent groups will be restored the next time the LDAP refresh runs; however, this can take up to 24 hours.)	false
For Single Sign-On:		
`saml.log.level`	Configures the log level for the SAML framework: ALL, TRACE, DEBUG, INFO, WARN, or ERROR.	INFO
`saml.maxAuthenticationAge`	Specifies how long, in seconds, users can single sign-on after their initial authentication with the Identity Provider (based on value AuthInstance of the Authentication statement). Some Identity Providers allow users to stay authenticated for longer periods than this, so you might need to change the default value.	7200
Other Properties:		

`jdk.xml.entityExpansionLimit`	Limits the number of XML entity expansions. Valid values are any positive integer. A value equal to 0 indicates no limit. If `jdk.xml.entityExpansionLimit` is not specified in **`uc.properties`** (or on start-up with `-Djdk.xml.entityExpansionLimit=<limit>`), Universal Controller will initialize it to a default value of 1. • If `jdk.xml.entityExpansionLimit` is specified on start-up with `-Djdk.xml.entityExpansionLimit=<limit>`, this takes precedence over the Universal Controller default value of 1. • If `jdk.xml.entityExpansionLimit` is specified in **`uc.properties`**, this takes precedence over specifying it on start-up with `-Djdk.xml.entityExpansionLimit=<limit>`.	1
`uc.date.formats`	Accepted input date formats for Date Functions and Stored Procedure parameters. For example: `uc.date.formats=yyyy/MM/dd;dd/MM/yyyy`. Formats can vary, but years must be defined with four digits (yyyy). Formats are used on a "first match" basis.	
`uc.email.attachments.local.path`	Directory location from where files can be attached for a specific Cluster Node / Server. You must specify a location in this property in order for the Attach Local File field to display in the Email Task and Email Notifications Details. The **`uc.properties`** file is refreshed every 10 minutes to accommodate changes to this property without requiring a restart. Every 10 minutes, **`uc.properties`** is read, and if this property value has changed, that new value then will be used within the Controller. This property is local to the Cluster Node and must be specified on each Node based upon the path for that Node. Each Node can have a different path, but they should point to the same shared physical location in order to achieve the expected behavior. Best practices would be to use the same path in each Node.	
`uc.keymanager.algorithm`	Java key manager algorithm. • For IBM AIX, the value must be IbmX509. • For all other platforms, use the default value. If no value is specified, the configured JVM default will be used.	
`uc.keymanager.client.alias`	If multiple certificates reside in the keystore that could match the OMS server's certificate request, specifying an alias ensures that the intended client certificate is presented to the OMS server.	
`uc.keymanager.keystore`	Location of the keystore which holds certificates and keys.	

`uc.keymanager.keystore.password`	Password (if required) for the keystore that will be replaced by **`uc.keymanager.keystore.password.encrypted`** in the **`uc.properties`** file upon start-up.	
`uc.keymanager.provider`	Java key manager provider. • For IBM AIX, the value must be IBMJSSE2. • For all other platforms, use the default value. If no value is specified, the configured JVM default will be used.	

`uc.mbean.catalina.manager.name`	The Controller uses the Catalina:type=Manager MBean for the User Sessions feature.
	To determine the Manager MBean object name, the Controller dynamically determines the context. For example:
	`Catalina:type=Manager,context=/uc,host=localhost`
	If the following error appears in the Universal Automation Center Console while you are using the User Sessions feature, you may need to configure this property manually:
	`Universal Controller not configured for user session operations.`
	In the uc.log, you would see the following:
	`javax.management.InstanceNotFoundException: Catalina:type=Manager,context=/uc,host=localhost`	

`uc.overdue.timer.startup.threshold`	Maximum number of days after which an overdue trigger is considered "stale/expired."	2
`uc.servlet.port`	Port number used by Tomcat.	8080
`uc.trustmanager.algorithm`	Java trust manager algorithm. • For IBM AIX, the value must be IbmX509. • For all other platforms, use the default value.	SunX509

`uc.trustmanager.provider`	Java trust manager provider. • For IBM AIX, the value must be IBMJSSE2. • For all other platforms, use the default value.	SunJSSE
`uc.trustmanager.ssl.protocols`	Comma-separated list of SSL/TLS protocols that can be used for Controller/OMS communications. • If the property does not contain a protocol list, a default SSL/TLS context will be referenced for building the SSL/TLS socket used for Controller/OMS communications. • If the property is used, only those protocols will be enabled for the Controller/OMS session. • If the property is not used, only the protocols specified in currently configured default SSL/TLS Context's default SSL/TLS protocol list will be enabled for the Controller /OMS session.	
`uc.trustmanager.truststore`	Location of the keystore which holds certificates and keys.	properties/cacerts
`uc.trustmanager.truststore.password`	Password (if required) for the keystore that will be replaced by **`uc.trustmanager.truststore.password.encrypted`** in the **`uc.properties`** file upon start-up.	changeit
`uc.trustmanager.truststore.password.encrypted`	Encrypted version of **`uc.trustmanager.truststore.password`** that will replace **`uc.trustmanager.truststore.password`** in the **`uc.properties`** file upon start-up.	
`uc.ui.session_timeout`	Default browser session timeout, in minutes. To use the Tomcat session configuration (default 30 minutes), set this property to 0.	30

`uc.web_service.httpclient.socket.keep_alive`	Specifies (true or false) whether TCP socket keep-alive option is enabled for HTTP(S)/REST Web Service Tasks.	false

Sample uc.properties File

```
# DB
uc.db.rdbms=mysql
uc.db.url=jdbc:mysql://localhost/
# MYSQL
# uc.db.mysql.character_encoding=UTF-8
# uc.db.rdbms=mysql
# uc.db.url=jdbc:mysql://localhost/
# MS SQLSERVER
# uc.db.rdbms=sqlserver
# uc.db.url=jdbc:sqlserver://localhost:1433;DatabaseName=uc
# ORACLE
# uc.db.rdbms=oracle
# uc.db.url=jdbc:oracle:thin:@//localhost:1521/@oracle.db.name@
#
# COMMON
#
# trust manager algorithm & provider
# uc.trustmanager.algorithm=SunX509
# uc.trustmanager.provider=SunJSSE
# uc.trustmanager.ssl.protocols=TLSv1,TLSv1.1,TLSv1.2
#
uc.db.user=root
uc.db.password=pswd
uc.db.name=uc
uc.servlet.port=8080
uc.ui.session_timeout=30
```

Universal Controller System Properties

Properties for your Universal Controller system are set (in the Controller database) during Controller installation. These properties let you define Controller system information and performance.

Universal Controller system properties do not reside in a properties file; they are available only via the user interface.

Although you can reset these properties any time after the Controller is in operation without having to stop and restart the Controller, you should click the Reload current page icon in your browser taskbar after resetting a property.

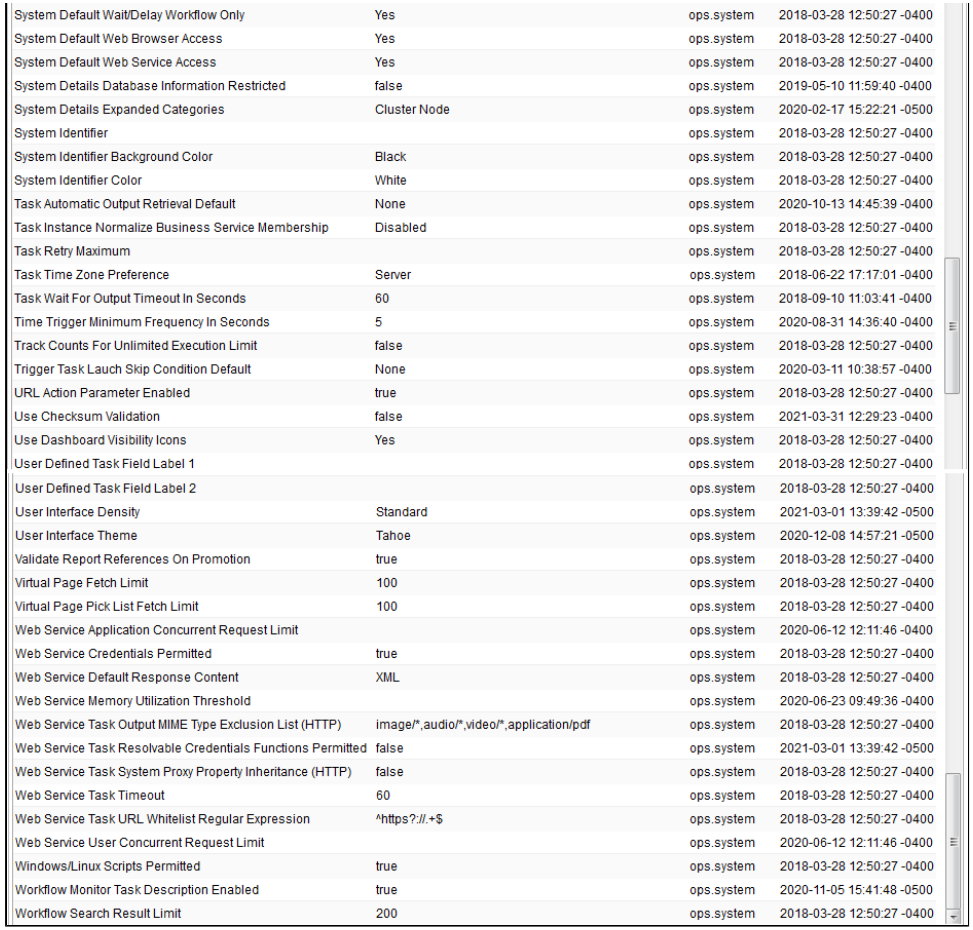
Note

You must be assigned the ops_admin role in order to reset these properties.

Step 1	From the Administration navigation pane, select **Configuration > Properties**. The Properties list displays.

Name	Value	Updated By	Updated
Administrator Email Address		ops.system	2018-03-28 12:50:27 -0400
Agent Cache Retention Period In Days	7	ops.system	2018-03-28 12:50:27 -0400
Agent Cluster Network Alias Cache Retention In Minutes	30	ops.system	2018-08-17 21:14:20 -0400
Agent Cluster Network Alias Retry Interval In Minutes	5	ops.system	2018-08-16 10:44:51 -0400
Agent Cluster Network Alias Uquery Port	7887	ops.system	2018-08-16 10:44:51 -0400
Agent Credentials Required	false	ops.system	2018-03-28 12:50:27 -0400
Agent Heartbeat Grace Period In Seconds	60	ops.system	2020-03-05 11:27:31 -0500
Agent Heartbeat Interval In Seconds	120	ops.system	2018-03-28 12:50:27 -0400
Agent Notification Disabled If Suspended	false	ops.system	2020-10-13 14:45:39 -0400
Agent Prefix	AGNT	ops.system	2018-03-28 12:50:27 -0400
Allow In Doubt Re-run	true	ops.system	2018-03-28 12:50:27 -0400
Automatically Create Versions	true	ops.system	2018-03-28 12:50:27 -0400
Automatically Skip Conflicting Multi-Origin Paths	false	ops.system	2018-03-28 12:50:27 -0400
Banner Background Color	#186CDA	ops.system	2019-02-06 11:07:35 -0500
Banner Logo		ops.system	2018-03-28 12:50:27 -0400
Banner Logo URL		ops.system	2018-03-28 12:50:27 -0400
Broadcast On Hold If Cluster Suspended	true	ops.system	2018-03-28 12:50:27 -0400
Broadcast On Hold If Cluster Unresolved	true	ops.system	2019-06-24 13:21:01 -0400
Bulk Export Activity Permitted	false	ops.system	2018-03-28 12:50:27 -0400
Bundle Exclude On Existence Picker Default	Email Templates	ops.system	2018-03-29 15:03:56 -0400
Bundleless Promotion With Execute Permission Permitted	false	ops.system	2019-01-30 15:35:24 -0500
Business Service Visibility Restricted	false	ops.system	2019-06-10 11:47:27 -0400
Calendar Preview Period In Years	2	ops.system	2018-03-28 12:50:27 -0400
CLI/Web Service Result Limit	1000	ops.system	2018-03-28 12:50:27 -0400
Client Export Fetch Limit	1000	ops.system	2018-03-28 12:50:27 -0400
Compress Bundle Promotion Payload	false	ops.system	2018-03-28 12:50:27 -0400
Confirm Enable/Disable Trigger Command	Yes	ops.system	2020-02-17 15:22:21 -0500
Confirm Exit	true	ops.system	2018-03-28 12:50:27 -0400
Confirm Update For Tasks In Workflows	false	ops.system	2020-06-23 10:50:47 -0400
Continue Monitoring Completed Workflows In Workflow Monitor	false	ops.system	2018-03-28 12:50:27 -0400
Copy Notes To Task Instances For Reporting	false	ops.system	2018-03-28 12:50:27 -0400
Create Version On Related List Change	true	ops.system	2018-03-28 12:50:27 -0400
Critical Path Calculations Permitted	true	ops.admin	2019-06-05 10:03:52 -0400
Critical Path Color	#FF0000	ops.system	2018-03-28 12:50:27 -0400
Critical Path Dynamic Calculation Threshold In Seconds	0	ops.system	2018-03-28 12:50:27 -0400
Critical Path Monitor Polling Interval In Seconds	300	ops.system	2018-03-28 12:50:27 -0400
Critical Path Monitor Polling Threshold In Seconds	60	ops.system	2018-03-28 12:50:27 -0400
Critical Path Projected Late Action Maximum	5	ops.system	2020-08-20 14:37:14 -0400
Critical Path Projected Late Threshold In Minutes	5	ops.system	2020-08-20 14:37:14 -0400
Custom Day Global Permitted	true	ops.system	2018-03-28 12:50:27 -0400
Custom Day Local Indicator Enabled	true	ops.system	2018-03-28 12:50:27 -0400
Custom Day Strict Mode	false	ops.system	2018-03-28 12:50:27 -0400
Data Backup/Purge Export Path		ops.system	2018-03-28 12:50:27 -0400
Disable Tab Indicators	false	ops.system	2018-03-28 12:50:27 -0400
Email Body Default Begin Marker	--BEGIN--	ops.system	2018-03-28 12:50:27 -0400
Email Body Default End Marker	--END--	ops.system	2018-03-28 12:50:27 -0400
Email Credentials Permitted	true	ops.system	2018-03-28 12:50:27 -0400
Email Monitor Polling Interval In Seconds	120	ops.system	2018-03-28 12:50:27 -0400
Email Notification Audit		ops.system	2020-01-23 10:33:17 -0500
Exclude Holidays For Business Days	false	ops.system	2018-03-28 12:50:27 -0400
Export Agent References	false	ops.system	2018-03-28 12:50:27 -0400
Export Path		ops.system	2018-03-28 12:50:27 -0400
Expose Resolved Script	false	ops.system	2018-03-28 12:50:27 -0400

Expose UDM Script	false	ops.system	2018-03-28 12:50:27 -0400
File Transfer Task Exclude Protocols	SFTP	ops.admin	2020-12-17 16:06:27 -0500
Flatten Reference List Fields In Chart Reports	true	ops.admin	2020-10-26 10:29:27 -0400
Forecast Period In Days	31	ops.system	2018-03-28 12:50:27 -0400
Inherit Actions On Defined For Insert Task	false	ops.system	2018-03-28 12:50:27 -0400
LDAP Synchronization Enabled	true	ops.system	2018-09-06 11:38:51 -0400
License Key	Click to view/apply...	ops.system	2021-03-09 14:20:32 -0500
List Qualifying Times Format	EEE, MMM dd, yyyy HH:mm:ss z Z	ops.system	2018-03-28 12:50:27 -0400
Log File Retention Period In Days	5	ops.system	2018-03-28 12:50:27 -0400
Log Level	INFO	ops.system	2018-03-28 12:50:27 -0400
Login Disclaimer		ops.system	2018-03-28 12:50:27 -0400
Login Notification		ops.system	2020-08-31 14:02:37 -0400
Maximum Nested Variable Depth	25	ops.system	2018-03-28 12:50:27 -0400
Maximum Nested Variable Expansion	250000	ops.system	2018-03-28 12:50:27 -0400
Maximum Processing Threads	1000	ops.system	2018-03-28 12:50:27 -0400
Maximum Timer Threads	300	ops.system	2018-03-28 12:50:27 -0400
Node Time Display	Yes	ops.system	2018-03-28 12:50:27 -0400
Node Time Display Background Color	White	ops.system	2018-03-28 12:50:27 -0400
Node Time Display Color	Black	ops.system	2018-03-28 12:50:27 -0400
Node Time Display Time Zone	Server	ops.system	2018-03-28 12:50:27 -0400
OMS Log Level	INFO	ops.system	2018-05-04 22:21:19 -0400
Recurring Task Launch Skip Condition Default	None	ops.system	2020-08-20 14:37:14 -0400
Recurring Task Minimum Frequency In Seconds	5	ops.system	2020-08-04 09:12:20 -0400
Remote File Monitor Task Exclude Protocols		ops.admin	2019-07-28 15:20:07 -0400
Report Average Color	#000000	ops.system	2020-01-23 10:33:17 -0500
Report Group Threshold	10	ops.system	2018-03-28 12:50:27 -0400
Report Threshold Color	#000000	ops.system	2020-01-23 10:33:17 -0500
Resolvable Credentials Permitted	false	ops.system	2018-03-28 12:50:27 -0400
Retain Overridden Step Codes On z/OS Task Re-run	false	ops.system	2018-05-11 11:49:04 -0400
Retrieve Output Default Number Of Lines	100	ops.system	2018-03-28 12:50:27 -0400
Retrieve Output Maximum Number Of Lines		ops.system	2018-03-28 12:50:27 -0400
Scheduled Report 3D Pie Chart	No	ops.system	2018-03-28 12:50:27 -0400
Scheduled Report Fetch Limit	1000	ops.system	2018-03-28 12:50:27 -0400
Scheduled Report Image Height	500	ops.system	2018-03-28 12:50:27 -0400
Scheduled Report Image Width	750	ops.system	2018-03-28 12:50:27 -0400
Scheduled Report Inline Image	Yes	ops.system	2018-03-28 12:50:27 -0400
Scheduled Report PDF Orientation	Landscape	ops.system	2018-03-28 12:50:27 -0400
Scheduled Report PDF Size	Letter	ops.system	2018-03-28 12:50:27 -0400
Scheduled Report Time Zone	Server	ops.system	2019-07-24 12:06:29 -0400
Show Metadata	No	ops.system	2018-07-17 03:30:11 -0400
Show Variables Fetch Global Automatically	No	ops.system	2018-03-28 12:50:27 -0400
SMTP Debug	false	ops.system	2018-03-28 12:50:27 -0400
SQL/Stored Procedure Close Additional Result Sets	true	ops.system	2018-03-28 12:50:27 -0400
SQL/Stored Procedure Ignore Update Count If No Results	false	ops.system	2018-03-28 12:50:27 -0400
SQL/Stored Procedure Maximum Rows		ops.system	2018-03-28 12:50:27 -0400
Start Server Paused	false	ops.system	2018-03-28 12:50:27 -0400
Stop Unknown Application Monitors	false	ops.system	2018-03-28 12:50:27 -0400
Strict Dashboard Create Constraints	false	ops.system	2018-03-28 12:50:27 -0400
Strict Report Create Constraints	false	ops.system	2018-03-28 12:50:27 -0400
System Default Activity Quick Filters	Active=!180,!190,!200;Blocked=10,20,23,30,33,60; Completed=180,190,200; Problem=35,81,99,110,120,125,130,140;	ops.system	2018-03-28 12:50:27 -0400
System Default CLI Bulk Import Path	/opt/apache-tomcat-8.0.33/opswise_import	ops.system	2018-03-28 12:50:27 -0400
System Default Command Line Access	Yes	ops.system	2018-03-28 12:50:27 -0400
System Default Confirm Launch Command	Yes	ops.system	2018-03-28 12:50:27 -0400
System Default Confirm Task Instance Commands	Yes	ops.system	2019-10-22 11:50:18 -0400
System Default Maximum Versions	3	ops.system	2020-02-14 15:15:48 -0500
System Default Trigger Simulate	false	ops.system	2018-03-28 12:50:27 -0400
System Default Update Virtual Resource Limit On Promotion	Yes	ops.system	2018-03-28 12:50:27 -0400



System Default Wait/Delay Workflow Only	Yes	ops.system	2018-03-28 12:50:27 -0400
System Default Web Browser Access	Yes	ops.system	2018-03-28 12:50:27 -0400
System Default Web Service Access	Yes	ops.system	2018-03-28 12:50:27 -0400
System Details Database Information Restricted	false	ops.system	2019-05-10 11:59:40 -0400
System Details Expanded Categories	Cluster Node	ops.system	2020-02-17 15:22:21 -0500
System Identifier		ops.system	2018-03-28 12:50:27 -0400
System Identifier Background Color	Black	ops.system	2018-03-28 12:50:27 -0400
System Identifier Color	White	ops.system	2018-03-28 12:50:27 -0400
Task Automatic Output Retrieval Default	None	ops.system	2020-10-13 14:45:39 -0400
Task Instance Normalize Business Service Membership	Disabled	ops.system	2018-03-28 12:50:27 -0400
Task Retry Maximum		ops.system	2018-03-28 12:50:27 -0400
Task Time Zone Preference	Server	ops.system	2018-06-22 17:17:01 -0400
Task Wait For Output Timeout In Seconds	60	ops.system	2018-09-10 11:03:41 -0400
Time Trigger Minimum Frequency In Seconds	5	ops.system	2020-08-31 14:36:40 -0400
Track Counts For Unlimited Execution Limit	false	ops.system	2018-03-28 12:50:27 -0400
Trigger Task Lauch Skip Condition Default	None	ops.system	2020-03-11 10:38:57 -0400
URL Action Parameter Enabled	true	ops.system	2018-03-28 12:50:27 -0400
Use Checksum Validation	false	ops.system	2021-03-31 12:29:23 -0400
Use Dashboard Visibility Icons	Yes	ops.system	2018-03-28 12:50:27 -0400
User Defined Task Field Label 1		ops.system	2018-03-28 12:50:27 -0400
User Defined Task Field Label 2		ops.system	2018-03-28 12:50:27 -0400
User Interface Density	Standard	ops.system	2021-03-01 13:39:42 -0500
User Interface Theme	Tahoe	ops.system	2020-12-08 14:57:21 -0500
Validate Report References On Promotion	true	ops.system	2018-03-28 12:50:27 -0400
Virtual Page Fetch Limit	100	ops.system	2018-03-28 12:50:27 -0400
Virtual Page Pick List Fetch Limit	100	ops.system	2018-03-28 12:50:27 -0400
Web Service Application Concurrent Request Limit		ops.system	2020-06-12 12:11:46 -0400
Web Service Credentials Permitted	true	ops.system	2018-03-28 12:50:27 -0400
Web Service Default Response Content	XML	ops.system	2018-03-28 12:50:27 -0400
Web Service Memory Utilization Threshold		ops.system	2020-06-23 09:49:36 -0400
Web Service Task Output MIME Type Exclusion List (HTTP)	image/*,audio/*,video/*,application/pdf	ops.system	2018-03-28 12:50:27 -0400
Web Service Task Resolvable Credentials Functions Permitted	false	ops.system	2021-03-01 13:39:42 -0500
Web Service Task System Proxy Property Inheritance (HTTP)	false	ops.system	2018-03-28 12:50:27 -0400
Web Service Task Timeout	60	ops.system	2018-03-28 12:50:27 -0400
Web Service Task URL Whitelist Regular Expression	^https?://.+$	ops.system	2018-03-28 12:50:27 -0400
Web Service User Concurrent Request Limit		ops.system	2020-06-12 12:11:46 -0400
Windows/Linux Scripts Permitted	true	ops.system	2018-03-28 12:50:27 -0400
Workflow Monitor Task Description Enabled	true	ops.system	2020-11-05 15:41:48 -0500
Workflow Search Result Limit	200	ops.system	2018-03-28 12:50:27 -0400

Step 2	If you want to change the value of a property, click a its **Value** field and select/enter a new value.
Step 3	To filter the list of displayed properties, enter appropriate characters (not case-sensitive) in the empty fields above the Name and/or Value columns. For example, to display only properties elated to promotion, enter **promotion** (or **PROMOTION**, **promo**, etc.) in the empty field above the Name column.

The following table describes the Universal Controller system properties:

Name (Property Name)	Description	Default
Administrator Email Address (uc.admin.email_addr)	System administrator email address(es) specified as the recipient(s) for System Notifications. Addresses for multiple administrators should be specified in a comma-separated list.	(none)

Agent Cache Retention Period in Days (uc.agent.cache.retention)	Number of days that cache files (stdout, stderr) are retained by the system.	7
Agent Cluster Network Alias Cache Retention In Minutes (uc.agent_cluster.network_alias.cache_retention_in_minutes)	Amount of time (in minutes) that a resolved Network Alias will be used before attempting to resolve it again.	30
Agent Cluster Network Alias Retry Interval In Minutes (uc.agent_cluster.network_alias.retry_interval_in_minutes)	Amount of time (in minutes) before automatically retrying the Network Alias resolution upon failure.	5
Agent Cluster Network Alias Uquery Port (uc.agent_cluster.network_alias.uquery_port)	Default port for an Agent Cluster with a Distribution method of Network Alias if no Agent Port is specified.	7887
Agent Credentials Required (uc.agent.credentials.required)	Specification (true or false) for whether or not Credentials are required for agent-based tasks and Application Resources.	false
Agent Heartbeat Grace Period in Seconds (uc.agent.heartbeat.grace_period_in_seconds)	Grace period in seconds (minimum 30, maximum 600) that the Controller will allow for a delayed heartbeat message.	60
Agent Heartbeat Interval in Seconds (uc.agent.heartbeat.interval.in.seconds)	Number of seconds between each heartbeat message sent by the agent to the Controller.	120
Agent Notification Disabled If Suspended (uc.agent.notification.disable_if_suspended)	Specification (true or false) for whether or not Agent notifications will not be processed (true) when a suspended Agent goes active/offline.	false
Agent Prefix (uc.agent.prefix)	Prefix appended to the Queue name for newly registered agents. A 4-digit number is appended to this prefix.	AGNT
Allow In Doubt Re-run (uc.task_instance.rerun.allow_in_doubt)	Specification (true or false) for whether or not the Controller will allow the re-run of a task instance if it is in the In Doubt status.	true

Automatically Create Versions (uc.version.automatically)	Specification (true or false) for whether or not the Controller will retain copies of previous versions. Affects system behavior when you make updates to records in your Controller database, such as changing a task definition.	true
Automatically Skip Conflicting Multi-Origin Paths (uc.workflow.skip_conflicting_multi_origin_paths)	Specification (true or false) for whether or not the Controller will automatically skip a task (within a workflow) that is connected to multiple upstream tasks, where one or more of the upstream tasks would cause the task to be run and one or more would cause the task to be skipped.	false
Banner Background Color (uc.banner.background_color)	Hexadecimal color code for the color of the Universal Controller user interface page banner. Valid values are #[0-9, a-f, A-F] (six characters).	#186CDA
Banner Logo (uc.banner.logo)	Name of the Banner Logo file to use in the Universal Controller user interface page banner (next to the Stonebranch logo). Enter the name of the logo file, excluding the path, from directory `../tomcat/uc_images/`. Valid logo files end in extension .png, .jpg, or .gif. Note The banner logo is allocated a maximum width of 298px and a maximum height of 32px. The image will be scaled, preserving its ratio, to fit within its designated area.	(none)
Banner Logo URL (uc.banner.logo_url)	URL of a web resource that you want the Banner Logo to link to. The URL must begin with `http://`, `https://`, or `ftp://` and contain no spaces. (Banner Logo URL is not a valid URL.)	(none)
Broadcast On Hold If Cluster Suspended (uc.cluster_broadcast.hold_on_suspended)	Specification (true or false) for whether or not cluster broadcast tasks will be run if the agent cluster selected for the broadcast has been suspended.	true
Broadcast On Hold If Cluster Unresolved (uc.cluster_broadcast.hold_on_unresolved)	Specification (true or false), for a task instance defined within a worfklow, if a broadcast cluster is specified, and Universal Controller is unable to find the broadcast cluster by id, or unable to resolve the broadcast cluster variable, or the Execution User cannot read the cluster due to security constraints, that the task instance should be Held, with an appropriate Hold Reason, rather than the instance becoming Undeliverable only when eligible to run.	true
Bulk Export Activity Permitted (uc.bulk_export.activity.permitted)	Specification (true or false) for whether or not to permit the Bulk Export Activity server operation to be run.	false
Bundle Exclude On Existence Picker Default (uc.bundle.exclude_on_existence.picker.default)	Default selection for the Exclude on Existence field in both the Bundle Details for a new Bundle and the Promote dialog when promoting one or more individual records, which identifies record types in the promotion payload that will not be updated if they exist on the target server. Use the Shift and/or Ctrl keys to select multiple record types.	(none)
Bundleless Promotion With Execute Permission Permitted (uc.promotion.bundleless.execute_permission.permitted)	Specifies whether or not a bundleless promotion should be limited to users with the ops_promotion_admin role, or if users with promotion target Execute permission should be permitted to perform a bundleless promotion.	false

Business Service Visibility Restricted (uc.bsrvc.visibility_restricted)	Specification (true or false) for whether or not drop-down lists for selecting a Business Service, such as in the Member of Business Services field, should restrict the visibility of Business Services available for selection based on a user's assigned (or inherited) Permissions and Roles. If a user has any Permission, directly assigned or inherited, with its Member of Any Business Service or Unassigned checkbox selected, the user will have no Business Service visibility restrictions. For any Permission that the user has, directly assigned or inherited, with an explicit Business Service specified for Member of Business Services, visibility for that specific Business Service will not be restricted. The following Roles, directly assigned or inherited, provide a user with unrestricted Business Service visibility. • ops_admin • ops_agent_cluster_admin • ops_bundle_admin • ops_dba • ops_email_admin • ops_oms_admin • ops_peoplesoft_admin • ops_promotion_admin • ops_sap_admin • ops_service • ops_snmp_admin • ops_user_admin Note In cases where the user can Read a record that is a member of one or more Business Services, and visibility for one or more of those Business Services is restricted for that user, the user will be able to see the display name of those Business Services in the Member of Business Services field; however, the drop-down will not contain those Business Services for selection. Any attempt to modify the selection of the Member of Business Services field will result in the removal of restricted Business Services from the selection.	false
Calendar Preview Period In Years (uc.calendar.preview.years)	Number of years (starting from the end of the current year) to show all Custom Days defined for a calendar in a Calendar Preview.	2

CLI /Web Service Result Limit (uc.cli.result_limit)	Maximum number of records that can be retrieved (or matched) for the following:
	
	• CLI List APIs excluding List Predecessors / Successors of a Task Instance in a Workflow CLI
	• CLI APIs for limiting matches:
	  • Launch a Task
	  • Export Trigger
	  • Disable a Trigger
	  • Enable a Trigger
	  • Launch Trigger Tasks Now
	• Web Service List APIs:
	  • List Task Instances
	  • List Tasks
	  • List Triggers
	  • List Virtual Resources
	  • List Variables
		1000

Client Export Fetch Limit (uc.export.client.fetch_limit)	Number of records to pre-fetch before performing an export to CSV, PDF, XLS (Excel), or XLSX. Before performing an export, the client will attempt to pre-fetch all list grid data. If after the pre-fetch, the list grid does not contain all matching rows, a warning displays, before continuing with the export, indicating that the export doesn't contain everything.	1000

Compress Bundle Promotion Payload (uc.bundle.payload_compression)	Specification (true or false) for whether or not the Controller will compress record bundles during a promotion.	false
Confirm Enable/Disable Trigger Command (uc.user.confirm.enable.disable.trigger.default)	Specification (yes or no) for whether or not a confirmation pop-up displays if a user selects to enable or disable a trigger.	yes
Confirm Exit (uc.browser.confirm_exit)	Specification (true or false) for whether or not a confirmation pop-up displays if a user navigates away from the Universal Controller user interface (or closes the browser without logging out).	true
Confirm Update For Tasks In Workflows (uc.task.confirm.workflow_update)	Specification (true or false) for whether or not a user, when updating a task, is prompted with a Confirmation dialog listing all Workflows containing that task, since those Workflows could be impacted by the task update.	false
Continue Monitoring Completed Workflows in Workflow Monitor (uc.workflow_monitor.monitor_completed)	Specification (true or false) for whether or not the Controller will continue monitoring completed Workflows in the Workflow Monitor.	false
Copy Notes to Task Instances for Reporting (uc.notes.copy_to_execs)	Specification (true or false) for whether or not the Controller will copy task notes to task instances so that task notes can be included in activity reports or gauges. For example, if true is specified, you can create a gauge that lists task notes for failed task instances. This property should be enabled only as needed.	false
Create Version On Related List Change (uc.version.on.related.list.change)	Specification (true or false) for whether or not a record version will be created if the user changes a record associated with the current record. For example, if true, the Controller will create a version of the task when the user changes a task variable.	true

Critical Path Calculations Permitted (uc.cp.calculations.permitted)	Specification (true or false) for whether or not a user can use the Critical Path feature of the Controller.
	
	• If this property is true:
	  ◦ The Toggle Critical Path View displays in the Workflow Monitor Toolbar.
	  ◦ The Calculate Critical Path field displays in the Workflow Details.
	• If this property is false:
	  ◦ The Toggle Critical Path View does not display in the Workflow Monitor Toolbar.
	  ◦ The Calculate Critical Path field does not display in the Workflow Details, either to view or modify.
	• If this property changes from false to true, logged-in users must log off/on to use the Critical Path feature.
	• If this property changes from true to false, the Critical Path feature will not be honored. However, Workflow Details will be preserved.
	
	Important
	
	• When restoring a Workflow Details Version, the Calculate Critical Path setting (enabled or disabled) will be preserved.
	• When promoting a Workflow record or importing (list or bulk) Workflow Details:
	  ◦ **Critical Path Calculations Permitted** setting will not change.
	  ◦ Calculate Critical Path, if enabled, will remain enabled.
	• If the database is "dropped" for any reason:
	  ◦ **Critical Path Calculations Permitted** will be set to **false**.
	  ◦ Calculate Critical Path, if enabled, will be disabled.
		false

Critical Path Color (uc.cp.color)	Hexadecimal color code for the color of the vertices and edges along the Critical Path displayed within the Workflow Monitor while in Critical Path view. Valid values are #[0-9, a-f, A-F] (six characters).	#FF0000 (red)
Critical Path Dynamic Calculation Threshold In Seconds (uc.cp.calculations.dynamic.threshold_in_seconds)	When a task instance completes, if the difference between its end time and its projected end time is greater than or equal to the threshold specified in seconds, a critical path recalculation event will be dispatched. Valid values are 0-600.	0
Critical Path Monitor Polling Interval In Seconds (uc.cp.monitor.polling.interval_in_seconds)	Interval (in seconds) in which that Universal Controller queries for task instances with a status greater than WAITING, and less than SKIPPED, and have elapsed their projected end time. Valid values are 60+.	300
Critical Path Monitor Polling Threshold In Seconds (uc.cp.monitor.polling.threshold_in_seconds)	Threshold (in seconds) that Universal Controller uses to determine if a task instance has elapsed its projected end time when polling. Valid values are 60+.	60
Critical Path Projected Late Action Maximum (uc.cp.projected_late.action.maximum)	Number of times that a task instance can invoke Actions On Projected Late before being muted. As a task instance Projected End Time changes, the Projected Late flag can be set and cleared multiple times. In such situations, this property limits the number of Actions being performed On Projected Late, such as Email Notifications, for a particular instance.	5
Critical Path Projected Late Threshold In Minutes (uc.cp.projected_late.threshold_in_minutes)	Threshold beyond the Late Start Time, Late Start Duration, or Late Finish Time that the projected time must exceed in order for the task instance to be flagged as Projected Late.	5

Custom Day Global Permitted (uc.custom_day.global.permitted)	Specification (true or false) for whether to enable (true) or disable (false) global Custom Days. Note You cannot set Custom Day Global Permitted to false if there are any existing global Custom Days.	true
Custom Day Local Indicator Enabled (uc.custom_day.local_indicator.enabled)	Specification (true or false) for whether to enable (true) or disable (false) the Local Custom Day indicator ({L}) for Trigger and Composite Trigger components, Task Run Criteria, and Calendar Preview.	true
Custom Day Strict Mode (uc.custom_day.strict.mode)	Specification (true or false) for whether or not a Custom Day referenced in the Complex section of Task Run Criteria for a task in a workflow must belong to the Calendar in use at run time.	false
Data Backup /Purge Export Path (uc.backup.path)	Export path to use instead of the default export path (`uc_backups` under the Tomcat directory) for Data Backup/Purge operations.	(none)
Disable Tab Indicators (uc.disable.tab.indicators)	Specification (true or false) for whether or not to disable the tab icons that indicate if tabs contain (green icon) or do not contain (gray icon) records.	false
Email Body Default Begin Marker (uc.email.body_begin_marker)	Default Begin Marker for Email Monitor Body Variables field.	- - BEGIN - -
Email Body Default End Marker (uc.email.body_end_marker)	Default End Marker for Email Monitor Body Variables field.	- - END - -
Email Credentials Permitted (uc.credentials.email.permitted)	Specification (true or false) for whether or not to enable the use of Email Credentials.	true
Email Monitor Polling Interval In Seconds (uc.email.monitor.polling.interval_in_seconds)	Number of seconds between each poll of a Mailbox Folder by an Email Monitor task.	120
Email Notification Audit (uc.email.notification.audit)	Specification (Success/Failed or Failed) for how to identify an Email Notification audit.	(none)

Exclude Holidays for Business Days (uc.calendar.exclude_holidays)	Specification (true or false) for whether or not the Controller will consider a Business Day on which a holiday falls as a non-Business Day. • If true, holidays that fall on Business Days are considered non-Business Days. • If false (the default), holidays that fall on Business Days are considered Business Days. For example, if the default value (false) is used, and a job is defined to run on Business Days, the job will run on Christmas Day, even though it is a holiday. This behavior applies to Triggers, Task Run Criteria, and JavaScript functions that operate on Business Days, and provides a means to avoid having to specify a restriction or skip criteria for holidays.	false
Export Agent References (uc.export.agent_references)	Specification (true or false) for whether or not the Controller will export referenced Agents when exporting definition XMLs with the Export References feature.	false
Export Path (uc.export.path)	Pathname where exported XML files are written. All cluster nodes use their own local system default export path. You should set a value for Export Path only if the path is writable by all cluster nodes. Note Any bulk import or list import of an Export Path property (from version 6.1.1.0 or earlier) will result in the server resetting the database back to the default "unset" Export Path value. Both bulk export and list export will first look for a configured Export Path property. If a value has not been set, they will use the local system default path of `<tomcat>/uc_export`.	(none)
Expose UDM Script (uc.infitran.expose_script)	***For debugging use only.*** Specification (true or false) for whether or not the Controller prepares a script when it launches a file transfer on a UDM installation. If troubleshooting is necessary, enabling this property allows you to view the script in the Output tab on the task instance.	false
Expose Resolved Script (uc.script_library.expose_resolved_script)	Specification (true or false) for whether or not to generate a SCRIPT output type capturing the resolved contents of the Scripts script for each task instance run attempt that utilizes a script from the Scripts. This property only applies to Scripts defined with the **Resolve UAC Variables** option checked. Any user with the task instance Read permission for a specific task instance will be able to view the SCRIPT output type content for that specific instance. To avoid generating unnecessary output, we recommend enabling this property only for debugging purposes. The unresolved script content can always be viewed from Scripts.	false
File Transfer Task Exclude Protocols (uc.task.file_transfer.exclude_protocols)	Specification for which protocols will be excluded from the Transfer Protocol field in the File Transfer Task Details: • FTP • SFTP • UDM • FTPS You can select multiple, but not all, protocols. Also, you cannot exclude a protocol if it is specified in the Transfer Protocol field for any exisitng File Transfer Task or Task Instance.	
Flatten Reference List Fields In Chart Reports (uc.report.flatten_references)	Specification (true or false) for whether or not to flatten Business Services in Chart reports when grouping by **Member of Business Services**.	false

Forecast Period in Days (uc.forecast.days)	Number of days to be included in a trigger forecast. See Displaying Trigger Forecast Information.	31
Inherit Actions On Defined For Insert Task (uc.inherit_actions.on_defined.insert_task)	Specification (true or false) for whether or not a task inserted into a Workflow, whose initial inserted status will be Defined, will perform inherited Workflow Actions for the Defined status.	false
LDAP Synchronization Enabled (uc.security.ldap.enabled)	Specification (true or false) for whether or not LDAP synchronization is enabled. This allows you to retain your LDAP Settings while using or not using LDAP authentication, as desired.	false
License Key (uc.license)	License key for your installation; provided to you by your Universal Controller representative.	(none)
List Qualifying Times Format (uc.trigger.date.format.display)	Format that you want the Controller to use when listing qualifying times for Time and Cron Triggers. See List Qualifying Times.	EEEEE, MMMMMMM dd, yyyy HH:mm:ss z Z
Log File Retention Period in Days (uc.log.retention)	Number of days that the Controller retains its log files.	5
Log Level (uc.log.level)	Level of logging for the Controller: • ALL • TRACE • DEBUG • INFO • WARN • ERROR	INFO
Login Disclaimer (uc.login.disclaimer}	Allows for the specification of free-form text to be displayed at the bottom of the Universal Automation Center Login page.	(none)
Login Notification (uc.login.notification}	Allows for the addition of a pop-up to be displayed on the Universal Automation Center Login page.	(none)
Maximum Nested Variable Depth (uc.variable.maximum_depth)	Maximum number of nested variables allowed.	25
Maximum Nested Variable Expansion (uc.variable.maximum_expansion)	Maximum number of nested variable characters allowed.	250000
Maximum Processing Threads (uc.threads.max)	Maximum number of processing threads used.	1000
Maximum Timer Threads (uc.timer.threads.max)	Maximum number of timer threads used.	300

Node Time Display (uc.node_time.display.default)	Specification (Yes or No) for whether or not the User Task Bar will display the Cluster Node time by default.	Yes
Node Time Display Background Color (uc.node_time.display.background_color.default)	Default color to use for the Cluster Node time field background in the User Task Bar.	White
Node Time Display Color (uc.node_time.display.color.default)	Default color to use for the Cluster Node time field in the User Task Bar.	Black
Node Time Display Time Zone (uc.node_time.display.tz.default)	Specification for whether to display the time zone of the **Server** or the **User** in the Cluster Node time field in the User Task Bar.	Server
OMS Log Level (uc.oms.log.level)	Level of logging for OMS: • ALL • TRACE • DEBUG • INFO • WARN • ERROR	INFO
Operational Memo Reset On Re-run uc.task_instance.operational_memo.reset_on_rerun	Specification (true or false) for whether or not to reset the Operational Memo field on a task instance re-run.	true
Perform Actions On Defined For Tasks Within Skipped Workflow (uc.perform_actions.on_defined.tasks_within_skipped_wf)	Specification (true or false) for whether or not tasks within a workflow that is being skipped due to trigger-time run criteria should perform Actions on Defined status and evaluate their own run criteria.	false
Perform Actions On Defined Workflow First (uc.perform_actions.on_defined.wf_first)	Specification (true or false) for whether or not to allow a workflow, on Defined status, to process its own Actions prior to processing any Actions for its children task instances on Defined status. This might be leveraged if, on Defined status, a workflow initializes a variable using the Set Variable Action, and a child task instance, also on Defined status, leverages that same variable in its own Set Variable Action.	false
Perform Actions On Halt (uc.perform_actions.on_halt)	Specification (true or false) for whether or not to allow the triggering of notifications for a task instance status change to Finished when issuing a Force Finish (Halt) or Force Finish/Cancel (Halt) command.	true

Platform Log Level (uc.platform.log.level)	Level of logging for the user interface framework: • ALL • TRACE • DEBUG • INFO • WARN • ERROR • OFF	WARN
Promotion History Retention Period in Days (uc.promotion_history.retention)	Number of days that the Controller retains Promotion History.	60
Promotion Schedule Retention Period In Days (uc.promotion_schedule.retention)	Number of days that a Promotion Schedule will remain available after the promotion has completed successfully.	7
Promotion Strict Mode (uc.promotion.strict_mode)	Specification for whether or not to fail a promotion if a record being promoted matches both of the following target records: • Record with same name / different sysid • Record with different name / same sysid If the record being promoted matches a target record by only one of the above conditions, the Controller will allow the promotion to continue. • If the record being promoted matches a target record with same name / different sysid, the id mismatch will be logged in this format: `Promoted {type} with name "name" and id 3c7a1b3c422049cab796e98fb5420ff3 has a different id than the original "name" with id 7b91616ff0dc431b9ae011f6e795806e.` • If the record being promoted matches a target record with different name / same sysid, it is considered a name update and the name mismatch will not be logged. Valid values are **0** (allow) and **1** (fail).	1
Purge Activity By Primary Key Limit (uc.backup.purge_by_primary_key.limit)	Number of task instances to purge per transaction while performing the Activity purge (by primary key).	500
Purge All Non-Default Users And Groups Permitted (uc.purge.non_default_users_and_groups.permitted)	Specification (true or false) for whether or not to allow the Purge All Non-Default Users And Groups Server Operation to be run.	false
Purge Dates From Custom Day List Older Than (uc.custom_day.purge_dates_older_than)	Number of days old (1-999) that a date in a Custom Day List of Dates will cause it to be purged automatically.	(none)

Re-run (Suppress Intermediate Failures) Permitted (uc.task_instance.rerun.suppress_intermediate_failures.permitted)	Specification (true or false) for whether or not you can manually Re-run a task instance specifying that intermediate failures be suppressed.	true
Reconcile Built-In Universal Template Changes On Promotion (uc.promotion.universal_template.system_template.reconcile_changes)	Controls the promotion behavior when promoting a Universal Task based on a built-in Universal Template that has changed.	false
Recurring Task Launch Skip Condition Default (uc.recurring.task.skip_condition.default)	Default value of the Task Launch Skip Condition field for a Recurring Task: • None • Active • Active By Recurring Task Instance	None
Recurring Task Minimum Frequency In Seconds (uc.recurring.task.minimum_frequency_in_seconds)	Minimum duration, in seconds, that a Recurring Task can have for a Recurrence Interval. The minimum value is 0.	5
Remote File Monitor Task Exclude Protocols (uc.task.ftp_file_monitor.exclude_protocols)	Specification for which protocols will be excluded from the Server Type field in the Remote File Monitor Task Details: • FTP • SFTP • FTPS You can select multiple, but not all, protocols. Also, you cannot exclude a protocol if it is specified in the Server Type field for any exisitng Remote File Monitor Task or Task Instance.	
Report Average Color (uc.report.average_color.default)	Specification of the default hexadecimal color of the average line when using the Show Average option on Bar Chart/Horizontal and Bar Chart/Vertical reports.	#000000
Report Group Threshold (uc.report.group_threshold.default)	If the Group Threshold field on the Report is - - System Default - -; Maximum number of groups to display on a Chart report. All groups above the threshold will be displayed in one group named Other. Note This option formerly was named System Default Report Group Threshold.	10
Report Threshod Color (uc.report.threshold_color.default)	Specification of the default hexadecimal color of the threshold line when using the Show Threshold option on Bar Chart/Horizontal and Bar Chart/Vertical reports.	#000000

Resolvable Credentials Permitted (uc.credentials. resolvable.permitted)	Specification (true or false) for whether or not the use of Resolvable Credentials is enabled.	false
Retain Overridden Step Codes On z/OS Task Re-run (uc.task_instance. rerun.zos. retain_step_codes)	Specification (true or false) for whether or not a changed return code of a previously executed step in a z/OS task is retained when the task is re-run.	false
Retrieve Output Default Number Of Lines (uc.retrieve_output. maximum_lines)	Specifies the default value for the Number of Lines field on the Retrieve Output dialog. Additionally, if the Number of Lines field is blank, it specifies the limit for the number of lines retrieved when Automatic Output Retrieval is enabled on a task.	100
Retrieve Output Maximum Lines (uc.retrieve_output. maximum_lines.limit)	Specifies the maximum number of lines that can be requested when retrieving output.	(none)
Scheduled Report 3D Pie Chart (uc.report.scheduled. 3d_pie_chart.default)	Specification (Yes or No) for whether Pie Chart reports are rendered in 2D (No) or 3D (Yes).	No
Scheduled Report Fetch Limit (uc.report.scheduled. fetch_limit)	Maximum number of records to fetch for inclusion in a List report (minimum is 1; no maximum). The report will indicate if the specified maximum has been reached.	1,000
Scheduled Report Image Height (uc.report.scheduled. image_height.default)	Specification for the height (in pixels) of PNG chart report images.	500
Scheduled Report Image Width (uc.report.scheduled. image_width.default)	Specification for the height (in pixels) of PNG chart report images.	750
Scheduled Report Inline Image (uc.report.scheduled. inline_image.default)	Specification (Yes or No) for whether to inline chart report images within the email (Yes) or include them as attachments (No). If any other attachments, such as standard error and standard output, are included, this property does not apply; the chart report image will be delivered as an attachment.	Yes
Scheduled Report PDF Orientation (uc.report.scheduled. pdf.orientation.default)	Specification (Landscape or Portrait) for the page layout of the PDF.	Landscape
Scheduled Report PDF Size (uc.report.scheduled. pdf.size.default)	Specification (Letter, Legal, or A4) for the page size of the PDF.	Letter

Scheduled Report Time Zone (uc.report.scheduled.tz.default)	Specification for whether to obtain the time zone from the Server (Server) or from the User record of the Execution User (User). This property applies to all report types (List, Bar Chart/Horizontal, Bar Chart/Vertical, and Pie Chart).	Server
Show Metadata (uc.form.show_metadata.default)	Specification (Yes or No) for whether or not the Metadata section displays automatically in the the Details of all Controller records. You can override this system default configuration by customizing the Show Metadata user preference.	No
Show Variables Fetch Global Automatically (uc.show_variables.fetch_global.default)	Specification (Yes or No) for whether or not to fetch and display Global Variables automatically for the Show Variables action. If No, the visibility of Global Variables in Show Variables can still be toggled, on demand, by the Show Global and Hide Global buttons. You can override this system default configuration by customizing the Show Variables Fetch Global Automatically user preference.	No
SMTP Debug (uc.smtp.debug)	Specification (true or false) for whether or not additional debug information about any Email Connection issues (for example, Email Connection Test fails or errors while sending emails) will be included in the log.	false
SQL /Stored Procedure Close Additional Results Sets (uc.sql_handler.close_additional_result_sets)	Specification (true or false) for whether or not to close any additional Result Sets if multiple Result Sets have been returned by SQL or Stored Procedure tasks. Note You should not change this property to false unless there is a backwards compatibility issue.	true
SQL /Stored Procedure Ignore Update Count If No Results (uc.sql_handler.update_count.ignore_if_no_results)	Specification (true or false) for whether or not to create a SQL Results record for rows affected when no results (result sets or update counts) are returned by SQL or Stored Procedure tasks.	false
SQL /Stored Procedure Maximum Rows (uc.sql_handler.maximum_rows)	Specifies the maximum number of rows that can be returned from an SQL task or Stored Procedure task.	(none)
Start Server Paused (uc.startup.paused)	Specification (true or false) for whether or not a Universal Controller cluster node should become paused when starting up. Note This property is applicable only for a Universal Controller cluster node that is starting up. Any cluster node that has already started will not be impacted. Once a cluster node is in paused mode, it will remain in paused mode until running the Resume Cluster Node server operation for that specific cluster node.	false
Stop Unknown Application Monitors (uc.application.stop_unknown_monitors)	Specification (true or false) for whether or not to stop any application monitors currently running on an Agent if the Controller is no longer managing those monitors (Windows and Linux/Unix only).	false

Strict Dashboard Create Constraints (uc.dashboard.create_constraints.strict)	Specification (true or false) for whether or not to restrict dashboard creation only to users with the ops_admin, ops_report_admin, ops_dashboard_group, or ops_dashboard_global role.	false
Strict Report Create Constraints (uc.report.create_constraints.strict)	Specification (true or false) for whether or not to restrict report creation only to users with the ops_admin, ops_report_admin, ops_report_group, or ops_report_global role.	false
System Default Activity Quick Filters (uc.activity.quick_filters.default)	Task instance status types to include in the Active, Blocked, Completed, and Problem Quick Filters. You can add statuses to or delete statuses from any of these Quick Filter. You also can delete any of these Quick Filters and create you own Quick Filters.	Active=!180,!190,!200; Blocked=10,20,23,30,33,60; Completed=180,190,200; Problem=35,81,99,110,120,125,130,140

System Default CLI Bulk Import Path (uc.bulk_import.path.default)	Pathname from where imported XML files are written.	`<tomcat-home>/uc_import`
		or
		`<tomcat-home>\uc_import`
		
		(`<tomcat-home>` is the base tomcat installation directory.)

System Default Command Line Access (uc.user.command_line.default)	Specification (Yes or No) for all users whose **Command Line access** field in their User Details is set to **-- System Default --**, for whether or not to control a user's ability to access the Controller through the Command Line Interface (CLI).	Yes
System Default Confirm Launch Command (uc.user.confirm.launch.default)	Specification (Yes or No) for whether or not a user is prompted with a Confirmation dialog when issuing the Launch command.	Yes
System Default Confirm Task Instance Commands (uc.user.confirm.task_instance.commands.default)	Specification (Yes or No) for whether or not to enable command confirmations when issuing commands against task instances.	No
System Default Maximum Versions (uc.version.maximum.default)	Maximum number of version records (1 to 255) to maintain per definition.	100

System Default Trigger Simulate (uc.trigger.simulation)	Specification (true or false) for whether or not to simulate the launching of tasks when triggers are eligible to fire. If simulation is enabled, only the scheduled launch of the task by the trigger is inhibited. All other aspects of the trigger execution, including generation of forecast data, are enabled. You can still force a trigger by using the Trigger Now command or launch a task by using the Launch command.	false
System Default Update Virtual Resource Limit On Promotion (uc.promotion. virtual_resource. update_limit.default)	Specification (Yes or No) for whether or not virtual resource limits are updated as part of a promotion.	Yes
System Default Wait /Delay Workflow Only (uc.timewait.workflow. only.default)	Specification (Yes or No) for whether or not to apply Wait/Delay Options to a task only if it runs within a workflow.	Yes
System Default Web Br owser Access (uc.user.browser. default)	Specification (Yes or No), for all users whose **Web Browser access** field in their User Details is set to **-- System Default --**, for whether or not to control a user's ability to access the Controller through the user interface.	Yes
System Default Web S ervice Access (uc.user.web_service. default)	Specification (Yes or No), for all users whose **Web Service access** field in their User Details is set to **-- System Default --**, for whether or not to control a user's ability to access the Controller through the RESTful Web Services API.	Yes
System Details Databa se Information Restrict ed (uc.widget. system_details. db_info_restricted)	Specification (true or false) for whether or not the followinng database information on the System Details widget is visible only to users assigned the ops_admin role or ops_server_operation_admin role: • Database Type • Database Name • Database URL • Database Connections These restrictions apply no matter where the System Details widget is accessed from: • Home Dashboard • Custom Dashboard • Widget List Preview • System Identifier on User Task Bar • System Clock on User Task Bar	
System Details Expanded Categories (uc.widget. system_details. expanded.default)	Specification for which System Details widget categories to expand by default: • Cluster Node • Release • Memory • License • Database	Cluster Node
System Identifier (uc.system_identifier)	User-selected name displayed in the System Identifier field on the User Task Bar.	(none)

System Identifier Background Color (uc.system_identifier.background_color)	Background color for the System Identifier field on the User Task Bar.	black
System Identifier Color (uc.system_identifier.color)	Text color for the System Identifier field on the User Task Bar.	white
Task Automatic Output Retrieval Default (uc.task.output_return_type.default)	Default Automatic Output Retrieval field value for Windows and Linux/Unix tasks and for Universal Templates.	None
Task Instance Normalize Business Service Membership (uc.task_instance.normalize_bsrvc)	Indicates if the Universal Controller is normalizing Business Service membership for Task Instance and History records: • Disabled Business Service normalization is not enabled. • Enabled/Normalizing Business Service normalization is enabled. New Task Instance and History records are being normalized; however, existing Task Instance and History record normalization has not completed. • Enabled/Normalized Business Service normalization is enabled. New Task Instance and History records are being normalized, and normalization of existing Task Instance and History records has completed. Note This property is read-only. It can be updated only by running the Enable Task Instance Business Service Normalization and Disable Task Instance Business Service Normalization server operations.	Disabled
Task Retry Maximum (uc.task.retry_maximum)	Specification for whether or not to enforce a maximum number of task instance retries. Valid values: 1. blank: No limit on Maximum Retries; Retry Indefinitely is permitted. 2. >=1: Limit on Maximum Retries; Retry Indefinitely is not permitted. Note If any current tasks are in violation of the selected >=1 Task Retry Maximum, an error message will occur. To see which tasks have a Maximum Retries value specified, or have Retry Indefinitely selected, run a Report on all tasks or display the Maximum Retries and Retry Indefinitely columns on the All Tasks list.	blank
Task Time Zone Preference (uc.task.time_zone_preference.default)	Specification (Server or Inherited) for whether the time zone for a task is evaluated on the time zone of the server or the time zone of the Parent Workflow or Trigger / Launch specification.	Server
Task Wait For Output Timeout In Seconds (uc.task.wait_for_output.timeout_in_seconds)	If Wait For Output is enabled for a task where automatic output retrieval is selected (potentially, to be used by a successor task); Length of time (in seconds) that the task will wait (that is, remain Running) until the output is returned by the Agent so that the successor task does not run before the output is available.	60
Time Trigger Minimum Frequency In Seconds (uc.trigger.time.minimum_frequency_in_seconds)	Minimum frequency - in seconds - of the Time Interval for a Time Trigger.	5

Track Counts For Unlimited Execution Limit (uc.execution_limit.unlimited.counts)	Specification (true or false) for enabling the tracking of task instances running concurrently if the Task Execution Limit field for an Agent or Agent Cluster is set to **Unlimited**. The following restrictions apply to this property: • If you change this property, all UI behavior based on this property will require logging out/logging in to take effect. • You cannot change this property from **false** to **true** while there are one or more task instances running against an Agent and/or Agent Cluster. • If you change this property from **false** to **true**, all Agents and Agent Clusters will begin tracking task counts. • If you change this property **true** to **false**, all Agents and Clusters that are not **Limited** will have their **Current Count** column set to 0. • If this property is **false**, and an Agent or Agent Cluster is **Unlimited**, the **Current Count** column will display as blank in the list and will be hidden in the Agent / Agent Cluster Details. • If this property is **true**, and an Agent or Agent Cluster is **Unlimited**, the **Current Count** column will display the current count and the current count will be visible in the Agent / Agent Cluster Details. • If this property is **false**, and you change an Agent / Agent Cluster from **Limited** to **Unlimited**, the current count will be reset back to 0. • If this property is **true** or **false**, and you change an Agent / Agent Cluster from **Unlimited** to **Limited**, the current count will be reset back to 0. Note For optimal performance, we recommend that you leave this property set to **false**.	false
Trigger Task Launch Skip Condition Default (uc.trigger.skip_condition.default)	Default value of the Task Launch Skip Condition field for all trigger types: • None • Active • Active By Trigger	None
URL Action Parameter Enabled (uc.url.action_parameter.enabled)	Specification (true or false) for whether or not to enable the URL Action parameter, which lets you automatically perform an action in the user interface.	true
Use Checksum Validation (uc.use.checksums)	Specification (true or false) for whether or not to implement checksum validation in order to prevent tampering of Controller data outside of the Controller system.	false
Use Dashboard Visibility Icons (uc.dashboard.use_visibility_icons.default)	Specification (Yes or No) of the system default for the Use Dashboard Visibility Icons user preference.	Yes
User Defined Task Field Label 1 (uc.task.custom_field1.label)	Label for this user-defined field that will display in the General Information section of the Details for all existing and new tasks and task instances.	(none)
User Defined Task Field Label 2 (uc.task.custom_field2.label)	Label for this user-defined field that will display in the General Information section of the Details for all existing and new tasks and task instances.	(none)

User Interface Desnity (uc.user_interface. density.default)	Default density setting (font and control size offset) for the user interface: • Dense (-2) • Compact (-1) • Standard (0) • Expanded (+1) • Spacious (+2) When the User Interface Density user preference is -- System Default --, this property specifies the density to be used.	Standard
User Interface Theme (uc.user_interface. theme.default)	Default display theme to use for the user interface: • Enterprise (legacy theme) • Enterprise Blue • Tahoe • Obsidian When the User Interface Theme user preference is -- System Default --, this property specifies the theme to be used.	Tahoe
Validate Report Refere nces On Promotion (uc.promotion.report. validate_references)	Specification (true or false) for whether or not to implement report-related promotion validation. Note ⚠ This property applies to the target system to which a promotion payload is being promoted.	true
Virtual Page Fetch Limi t (uc.virtual_page. fetch_limit)	Virtual page size to be used when scrolling in a list.	100
Virtual Page Pick List F etch Limit (uc.virtual_page. pick_list.fetch_limit)	Virtual page size to be used when scrolling the options in a drop-down list that are bound by another data source (for example, the Task To Monitor drop-down list options in the Task Monitor Task Details).	100
Web Service Application Concurrent Request Limit (uc.web_service. application. concurrent_request. limit)	Controls the number of concurrent requests for the application (that is, the Universal Controller server). The application-level concurrent request limit cannot be less than 1 or less than the user-level concurrent request limit (if specified).	(none; that is, no limit)

Web Service Credentia ls Permitted (uc.credentials. web_service.permitted)	Allows enabling/disabling the use of Web Service credentials.
	
	• If false:
	  • Creation of new Web Service credentials will be prohibited.
	  • All Web Service Task Instances using authentication will transition into the Start Failure status.
	• If false on a target Controller to which you are promoting, the promotion will fail.
		true

Web Service Default R esponse Content (uc.web_service. response.content. default)	Default type of content, XML or JSON, for web service responses.	XML

Web Service Memory Utilization Threshold (uc.web_service.memory.utilization.threshold)	Percentage of allocated memory in use that defines a threshold for prohibiting access to the RESTful Web Service API. The threshold must be a whole number (integer) and cannot be less than 1 or more than 99.	(none; that is, no threshold))
Web Service Task Output MIME Type Exclusion List (HTTP) (uc.task.web_service.output.mime_type.exclusion_list)	List of content-types, such as binary, that are discarded to avoid being stored as Web Service Task output, which are not supported and can lead to task instance run failure.	image/*,audio/*,video/*,application/pdf
Web Service Task Resolvable Credentials Functions Permitted (uc.task.web_service.credentials.resolvable.functions.permitted)	Specification (true or false) for whether or not to permit Resolvable Credential functions support in Web Service tasks. Note In order to enable Resolvable Credential functions support for Web Service Task, this property and the Resolvable Credentials Permittedsystem property must set to true.	false
Web Service Task System Proxy Property Inheritance (HTTP) (uc.task.web_service.http.proxy_property_inheritance)	Specification (true or false) for whether or not to use the Java proxy system properties for HTTP Web Service tasks.	false
Web Service Task Timeout (uc.task.web_service.timeout)	Number of seconds to wait for the request to complete, if a Timeout value is not specified for a Web Service task.	60
Web Service Task URL Whitelist Regular Expression (uc.task.web_service.url.whitelist)	Regular Expression that specifies the URLs supported by the Web Service task. (The default value specifies that all URLs are supported.) If you have a specific regex that you want to be case-insensitive, pre-pend the following option to the regex: (?i)"."(?i)	^https?://.+$
Web Service User Concurrent Request Limit (uc.web_service.user.concurrent_request.limit)	Controls the number of concurrent requests per unique user ID. The user-level concurrent request limit cannot be less than 1 or greater than the application-level concurrent request limit (if specified).	(none; that is, no limit)
Windows/Linux Scripts Permitted (uc.script.distributed.permitted)	Specification (true or false) for whether to enable (true) or disable (false) the use of the Script Script type. Note You can set Windows/Linux Scripts Permitted to false only if currently there are no Script Script types defined in the database.	true
Workflow Monitor Task Description Enabled (uc.workflow.monitor.task.description.enabled)	Specification (true or false) for whether to enable (true) or disable (false) the display of a **Task Description** field in the Task Instance Details for a task instance in a Workflow Monitor.	true

Workflow Search Result Limit (uc.workflow.search_result_limit)	Results limit when querying for task records from the Task Find or Open Workflow pop-up.	200

Overriding Universal Controller System Properties

You can override any Universal Controller system property by adding it to the Universal Controller Start-up Properties (uc.properties) file and restarting the Controller.

Any Universal Controller system property added to **`uc.properties`** must be in the same format as the **`uc.properties`** properties: **`<Property Name>=<value>`**. For example: **`uc.startup.paused=true`**

When the restarted Controller reads the **`uc.properties`** file, it updates the database with the value of any Universal Controller system property included in the file. It then removes that property from the file.

Command Line Interface (CLI) Properties

A sample Command Line Interface (CLI) configuration file, **`cmdtools.props`**, is provided for your use to pass CLI Global parameters to a CLI function.

The file is created during installation of Universal Agent if the Command Line Interface (CLI) has been selected to be installed.

```
network.provider=
network.omsservers=
network.omsnft=
network.transports=
network.core=HUB01
security.userid=
security.password=
config.timeout=
```

However, you can create a configuration file with any name; it must exist in the directory from where you are issuing the functions (see Command Line Interface (CLI)).

Truststore

- Overview
- Configuring Universal Controller
- Importing Server Certificates

Overview

Universal Controller requires a truststore (keystore) in order to support SSL/TLS validation and encryption for LDAPS and HTTPS communications. The truststore will contain the server certificates or the root certificate (Certificate Authority) that issued the server certificate.

Universal Controller truststore uses the Oracle Java keystore format (JKS). By default, and without further configuration, the Java keystore will be used. The Java keystore (cacerts) is located in the `/lib/security` sub-directory of the JRE home directory.

Server certificates can be imported using the Oracle Java keytool utility, which can be found in the `bin` sub-directory of the JRE home directory.

JRE version-specific documentation for the keytool utility can be found at docs.oracle.com. For JRE 8, the documentation is available at http://docs.oracle.com/javase/8/docs/technotes/tools/windows/keytool.html.

Configuring Universal Controller

If you choose not to use the JRE keystore, you must configure the following properties in the Universal Controller Start-up Properties (uc.properties) file:

- uc.trustmanager.truststore
- uc.trustmanager.truststore.password

These properties will take effect only after you restart Tomcat.

Importing Server Certificates

After you have obtained the certificate, you will need to import the certificate into the truststore. This can be done with the following example keytool command, which will create the keystore if it does not already exist:

```
keytool -keystore $JAVA_HOME/lib/security/cacerts -importcert -trustcacerts -file server_ca_certificate.pem -alias serverca
```

LDAP Settings

- Overview
- Credentials for Running Tasks Authentication
- User Login Authentication
- LDAP Settings Field Descriptions
- Mappings Tab
  - Mappings Tab Column Descriptions
  - Mapping Details
- Best Practices
  - Determining your User OUs and Group OUs
  - Customizing Users and Groups Lists to see DN of LDAP Synchronized Users and Groups
  - LDAP Server Operations
  - LDAP Settings Fields
- SSL/TLS Secured LDAP (LDAPS)

Overview

Note

The information provided on this page assumes you have a working knowledge of LDAP authentication.

LDAP Settings, which allow you to enable the LDAP bridge for both UNIX and Windows operating systems, are available through the user interface.

You can set up Universal Controller to use LDAP authentication for:

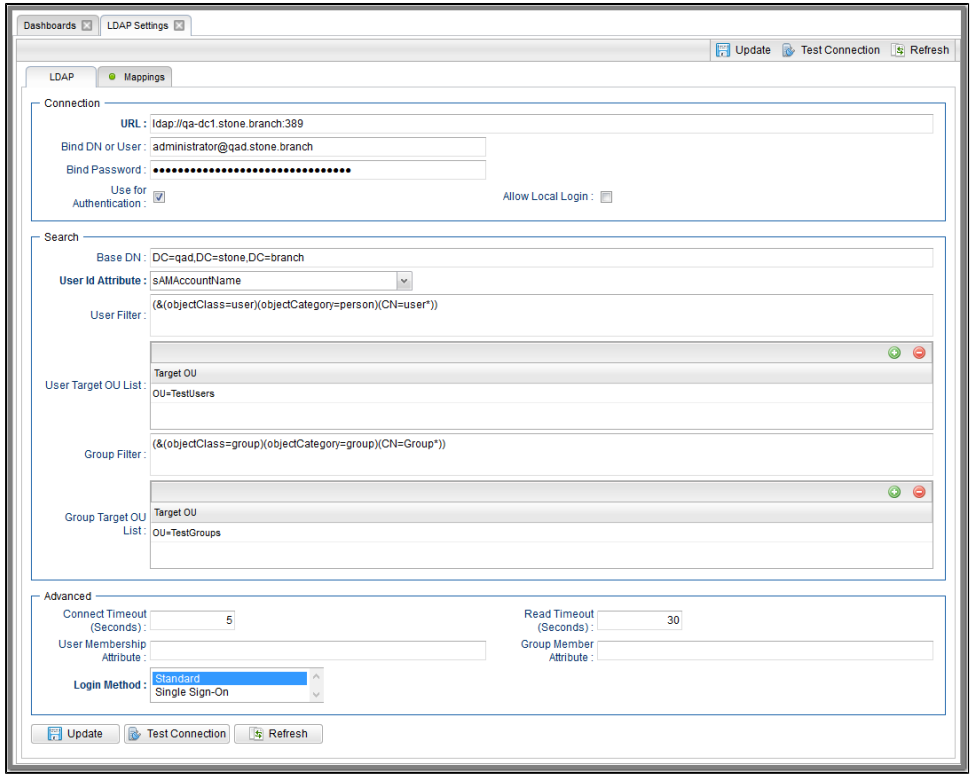
- Credentials for running tasks
- User logins

Credentials for Running Tasks Authentication

To use LDAP authentication for Universal Controller user credentials:

UNIX	If you want the credentials for Universal Agent to go through LDAP authentication, the UNIX machine on which the Agents reside require PAM. The Agents must be configured to use PAM, and PAM must be configured to use LDAP. The UNIX systems that support PAM authentication are AIX, HP-UX, Linux, and Solaris. Refer to Security of Universal Agent Components to see which Agent Server components can use PAM authentication on these systems. Set up your PAM configuration to use the PAM LDAP module. Depending on your LDAP version, some other configuration steps may be required. Once PAM is configured, tasks specifying credentials will authenticate over LDAP transparently.
Windows	While no set-up steps are required to specifically enable Domain/Active Directory credential authentication, the target system does need to belong to a Domain or Active Directory Forest. When you specify credentials for a task, use DOMAIN\user as the user name.

User Login Authentication

Step 1	From the Administration navigation pane, select **Configuration > LDAP Settings**. The LDAP Settings page displays. 
Step 2	Enter / select your LDAP Settings, using the field descriptions below as a guide. • Required fields display in **boldface**. • Default values for fields, if available, display automatically.
Step 3	Click the **Update** button.

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

Note

In order to log in to the Controller using LDAP, you must set the LDAP Synchronization Enabled Universal Controller System property (**Administration > Configuration > Properties** in the Controller user interface) to **true**.

LDAP Settings Field Descriptions

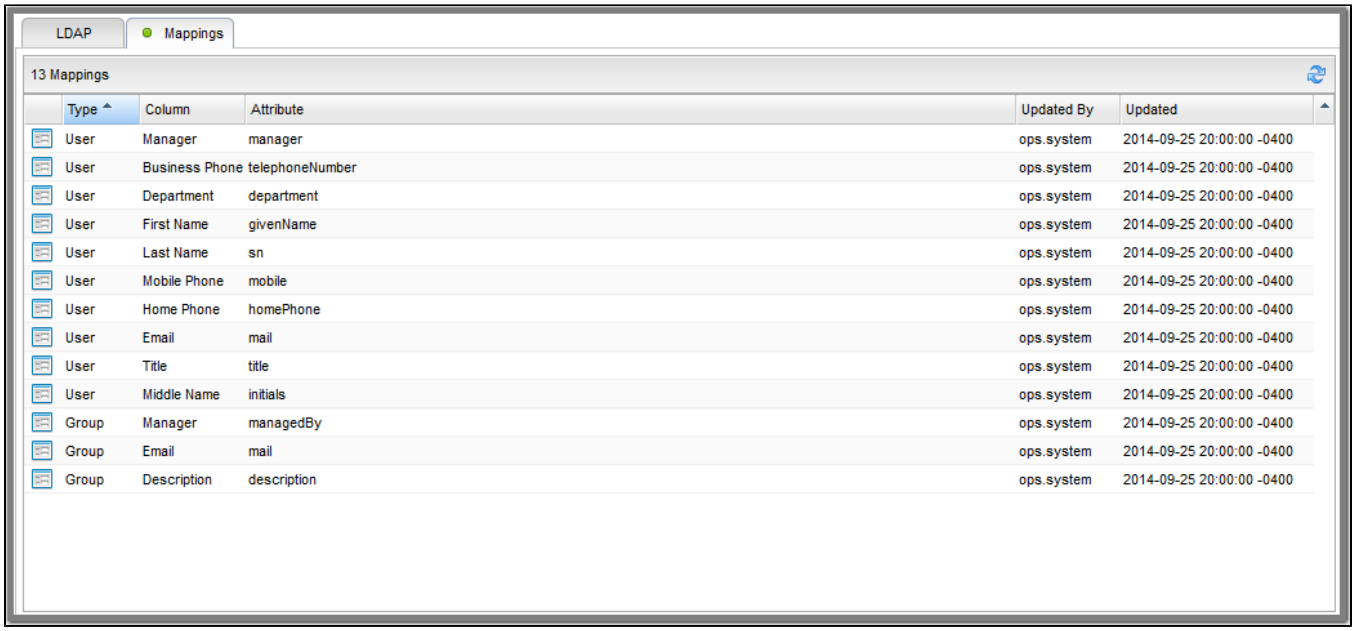
The following table describes the fields and buttons that display in the LDAP Settings.

Field Name	Description
Connection	This section contains information on the LDAP connection.
URL	URL of the LDAP connection. For example: • **`ldap://ldap.stonebranch.com:389/`** • **`ldaps://192.202.185.90:636/`** To use SSL/TLS encryption (**`ldaps://`**), you will have to configure the Universal Controller truststore with an X.509 CA certificate in either of these formats: • DER-encoded binary • Base64-encoded
Bind DN or User	Distinguished Name (DN) or User ID used for initial access to the LDAP server.
Bind Password	Password associated with the Bind ND or User.
Use for Authentication	If enabled, indicates that LDAP will be used for password authentication.
Allow Local Login	If the LDAP Synchronization Enabled Universal Controller system property is false, or if it is true but the Use for Authentication field is not enabled, an administrator must explicitly specify Allow Local Login to allow local account login for users that were provisioned through LDAP synchronization. This option is intended only to provide temporary access while an LDAP directory is unavailable. An administrator will need to update the local account password for any LDAP-synchronized user who requires temporary local account login, as the provisioned password would be unknown.
Search	This section contains search information.
Base DN	Starting point for searching the directory. For example: **`dc=stonebranch,dc=com`**. If you do not specify a Base DN, the search starts as the root of the directory tree.
User Id Attribute	LDAP attribute for the specified User ID. Options: • sAMAccountName • cn • uid • Other...
User Filter	Search filter for users. If you do not specify a User Filter, the server uses **`(&(objectClass=user)(objectCategory=person))`**.
User Target OU List	Single- or multi-level target OU's (Organizational Units) within the Base DN directory to filter for user records. For example, **`OU=Employees`** or **`OU=Employees,OU=Users`**. If you do not specify one or more OU's, the entire sub-tree from the Base DN will be searched.

Group Filter	Search filter for groups. If you do not specify a Group Filter, the server uses **`(&(objectClass=group)(objectCategory=group))`**.
Group Target OU List	Single- or multi-level target OU's within the Base DN directory to filter for group records. For example, **`OU=Universal Controller`** or **`OU=Universal Controller,OU=Groups`**. If you do not specify one or more OU's, the entire sub-tree from the Base DN will be searched.
Advanced	This section contains advanced information.
Connection Timeout (Seconds)	Timeout for connecting to the LDAP server.
Read Timeout (Seconds)	Timeout for reading from the LDAP server.
User Membership Attribute	LDAP attribute for the groups in which a user is a member. If you do not specify a User Membership Attribute, the LDAP server uses **memberOf** (see the `uc.ldap.users.synchronize_indirect`Universal Controller start-up property.
Group Member Attribute	LDAP attribute for the members of a group. If you do not specify a Group Member Attribute, the LDAP server uses **member** (see the `uc.ldap.groups.update_members`Universal Controller start-up property.
Login Method	Login method(s) that an LDAP-provisioned user can authenticate with by default. The default is applied only at user creation time. (You can use the Ctrl key to select both methods.) Options: • Standard • Single Sign-On
Buttons	This section identifies the buttons displayed above and below the LDAP Settings that let you perform various actions.
Update	Saves updates to the record.
Test Connection	After saving the LDAP Settings to the database, click **Test Connection** to run a connection test.
Refresh	Refreshes any dynamic data displayed in the LDAP Settings.
Tabs	This section identifies the tabs across the top of the LDAP Settings page that provide access to additional information about the LDAP Settings.
Mappings	List of User and Group columns mapped to LDAP attributes that enables you to customize how the User/Group records get populated from LDAP.

Mappings Tab

The Mappings tab of the LDAP Settings page displays a list of Controller columns mapped to LDAP attributes.



Type	Column	Attribute	Updated By	Updated
User	Manager	manager	ops.system	2014-09-25 20:00:00 -0400
User	Business Phone	telephoneNumber	ops.system	2014-09-25 20:00:00 -0400
User	Department	department	ops.system	2014-09-25 20:00:00 -0400
User	First Name	givenName	ops.system	2014-09-25 20:00:00 -0400
User	Last Name	sn	ops.system	2014-09-25 20:00:00 -0400
User	Mobile Phone	mobile	ops.system	2014-09-25 20:00:00 -0400
User	Home Phone	homePhone	ops.system	2014-09-25 20:00:00 -0400
User	Email	mail	ops.system	2014-09-25 20:00:00 -0400
User	Title	title	ops.system	2014-09-25 20:00:00 -0400
User	Middle Name	initials	ops.system	2014-09-25 20:00:00 -0400
Group	Manager	managedBy	ops.system	2014-09-25 20:00:00 -0400
Group	Email	mail	ops.system	2014-09-25 20:00:00 -0400
Group	Description	description	ops.system	2014-09-25 20:00:00 -0400

Mappings Tab Column Descriptions

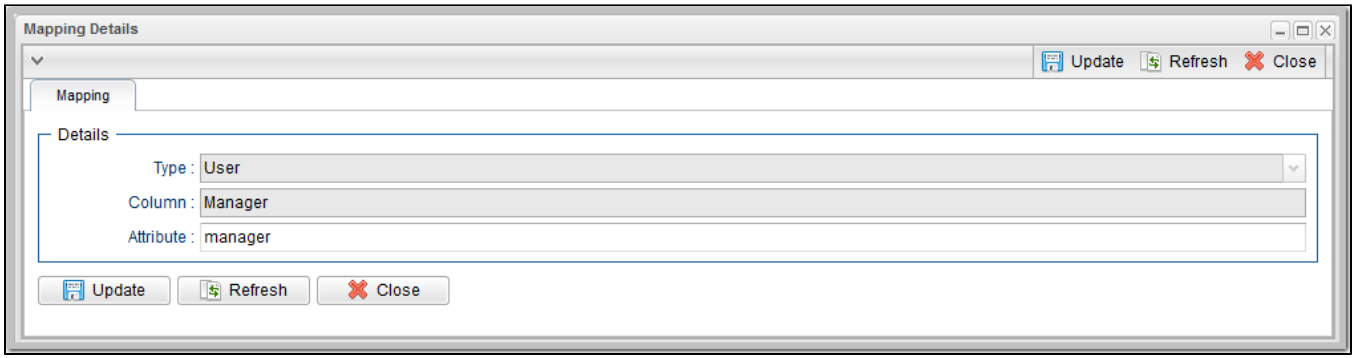
The following table describes the default columns displayed on the Mappings tab:

Type	Type of records.
Column	Controller column being mapped to LDAP attribute.
Attribute	LDAP attribute to which the Controller column is being mapped.
Updated By	User who last updated this record.
Updated	Date and time this record was last updated.

Mapping Details

To view the Mapping Details for a mapping on the list, click the Details icon next to that mapping.

For example:



Best Practices

The following best practices are provided to assist you in configuring LDAP.

Determining your User OUs and Group OUs

1. Determine which users/groups need to have access to Universal Controller.
2. Determine which Organizational Units (OUs) those users/groups belong to.
3. Build your list of user and group OUs.

Consider the following organizational units for required Users and Groups.

Users

OU=NorthAmerica,OU=CorporateUsers,**OU=Corporate,DC=stonebranch,DC=com**
OU=Students,**OU=Corporate,DC=stonebranch,DC=com**

Groups

OU=AtlantaGroup,OU=CorporateGroups,**OU=Corporate,DC=stonebranch,DC=com**
OU=OntarioGroup,OU=CorporateGroups,**OU=Corporate,DC=stonebranch,DC=com**
OU=OtherGroups,**OU=Corporate,DC=stonebranch,DC=com**

You specify the User and Group Target OUs relative from the Base DN. In this case, the Base DN would be **OU=Corporate,DC=stonebranch,DC=com**.

For the User Target OU List LDAP Settings field, you would have the following entries:

OU=NorthAmerica,OU=CorporateUsers
OU=Students

For the Group Target OU List LDAP Settings field, you would have the following entries:

OU=AtlantaGroup,OU=CorporateGroups
OU=OntarioGroup,OU=CorporateGroups
OU=OtherGroups

Customizing Users and Groups Lists to see DN of LDAP Synchronized Users and Groups

For each User and Group object in the LDAP directory that matches the configured search and OU configuration in Universal Controller, a User and Group record are created in the Controller to represent those objects.

For each User and Group record in the Controller that represents a synchronized LDAP User or Group, the **Source** column on the Users list or Groups List, respectively, contains the Distinguished Name of that User or Group in LDAP. (For Users and Groups created locally in the Controller, the **Source** column is blank.)

For example:

Source Column for a User	ldap:CN=Stonebranch User,OU=TestUsers,DC=qad,DC=stone,DC=branch
Source Column for a Group	ldap:CN=UnvControllerParent,OU=TestGroups,DC=qad,DC=stone,DC=branch

Note

By default, the **Source** column is not shown on either lists. For instructions on how to add the **Source** column, see Selecting Columns / Column Locations for a List.

LDAP Server Operations

If LDAP is configured for Universal Controller, it refreshes every 24 hours.

Additionally, the Controller provides two Server Operations that let you force an LDAP refresh:

- **LDAP Refresh (Asynchronous)**
  This server operation performs an LDAP refresh in the background and sends entries to the Universal Controller log.
- **LDAP Refresh**
  This server operation perform an LDAP refresh that writes all log entries to the user interface as well as to the log, and prevents all other user activity while the process is running. If you estimate the refresh could take a considerable amount of time, we recommend you use the **LDAP Refresh (Asynchronous)** server operation.

LDAP Settings Fields

The following Best Practices should be followed for specific fields in the LDAP Settings.

URL

To avoid an inadvertent synchronization of LDAP using an incomplete LDAP configuration, refrain from providing a value for this setting until LDAP configuration has been completed.

Once LDAP configuration has been completed, you can utilize the LDAP Refresh server operation to verify your configuration.

Base DN

All directory searches are relative from the base object defined by the specified DN. The Base DN (or search entry point) should be the lowest base object in the directory for which both the User and Group OUs can be searched from.

If your Users are in:	**OU=CorporateUsers,OU=Corporate,DC=stonebranch,DC=com**
And your Groups are in:	**OU=CorporateGroups,OU=Corporate,DC=stonebranch,DC=com**
Your Base DN can be:	**OU=Corporate,DC=stonebranch,DC=com**

User Filter

This setting defines which objects the Controller considers as Users when it queries objects in the configured User OUs (see pointers on configuring User OUs).

By default, the server will use filter **(&(objectClass=user)(objectCategory=person))**.

For Active Directory (AD)	At a minimum, specify the following: `(&(objectClass=user)(objectCategory=person))` This filter would match both user and **inetOrgPerson objectClasses**. **objectCategory=person** is added for two reasons: • It is an indexed attribute, so the query performance is optimized. • Without it, Computer objects could be synchronized. For example, in AD, a computer **objectClass** extends from a user **objectClass**, but a computer's **objectCategory=computer**, not **person**.

Note

Once an object (User or Group) is synchronized into the Controller, it will not be deleted if search filter/OU criteria are narrowed. However, broadening your search filter/OU scope will pull in new objects. After modifying your LDAP configuration to narrow the search scope, a Controller administrator will need to delete any Users and Groups that are no longer desired/match the LDAP configuration.

You can synchronize Users that belong only to a specific Group, such as one created for Unversal Controller.

For example:

```
CN=UnvControllerGroup,OU=CorporateGroups,OU=Corporate,DC=stonebranch,DC=com
```

To ensure that only Users belonging to **UnvControllerGroup** are synchronized, modify the recommended minimum user search filter:

```
(&(objectClass=user)(objectCategory=person)(memberOf=CN=UnvControllerGroup,OU=CorporateGroups,OU=Corporate,DC=stonebranch,DC=com))
```

You can synchronize Users that belong any Group that is a descendant of **UnvControllerGroup**.

For example:

- **UnvControllerGroupA** is a member of **UnvControllerGroup**.
- **UnvControllerGroupB** is a member of **UnvControllerGroupA**.
- **UnvControllerGroupC** is a member of **UnvControllerGroupB**.

To achieve this in AD, modify the search filter used to synchronize users that belong only to a specific Group:

```
(&(objectClass=user)(objectCategory=person)(memberOf:1.2.840.113556.1.4.1941:=CN=UnvControllerGroup,OU=CorporateGroups,OU=Corporate,DC=stonebranch,
DC=com)))
```

Essentially, replacing **memberOf** with **memberOf:1.2.840.113556.1.4.1941:** will ensure that nested groups are considered.

1.2.840.113556.1.4.1941 (Matching rule OID) is a special "extended match operator" that walks the chain of ancestry in objects all the way to the root until it finds a match (see http://msdn.microsoft.com/en-us/library/windows/desktop/aa746475(v=vs.85).aspx).

Group Filter

This setting defines which objects the Controller considers as Groups when it queries objects in the configured Group OUs (see pointers on configuring Group OUs).

By default, the server will use filter **(&(objectClass=group)(objectCategory=group))**.

For Active Directory (AD)	It is recommended that you optimize the query performance by incorporating the indexed **objectCategory** attribute: **`(&(objectClass=group)(objectCategory=group))`**

To limit the Groups synchronized from LDAP to a few specific Groups or Groups by name, adjust the Group search filter to include a query on the CN (common name) attribute.

For example, to synchronize a single group named **CN=UnvControllerGroup,OU=CorporateGroups,OU=Corporate,DC=stonebranch,DC=com**, modify the recommended minimum group search filter:

```
(&(objectClass=group)(objectCategory=group)(cn=UnvControllerGroup))
```

To synchronize only **UnvControllerGroupA**, **UnvControllerGroupB**, and **UnvControllerGroupC**, use the following filter:

```
(&(objectClass=group)(objectCategory=group)(|(cn=UnvControllerGroupA)(cn=UnvControllerGroupB)(cn=UnvControllerGroupC)))
```

To synchronize any Group that is a (direct) member of **UnvControllerGroup**, use the following search filter:

```
(&(objectClass=group)(objectCategory=group)(|(cn=UnvControllerGroup)(memberOf=CN=UnvControllerGroup,OU=CorporateGroups,OU=Corporate,DC=stonebranch,
DC=com)))
```

To synchronize any Group that is a descendant of **UnvControllerGroup** (multi-nested groups), use the following search filter:

```
(&(objectClass=group)(objectCategory=group)(|(cn=UnvControllerGroup)(memberOf:1.2.840.113556.1.4.1941:=CN=UnvControllerGroup,OU=CorporateGroups,OU=Corporate,DC=stonebranch,DC=com)))
```

Essentially, replacing **memberOf** with **memberOf:1.2.840.113556.1.4.1941:** will ensure that nested groups are considered.

1.2.840.113556.1.4.1941 (matching rule OID) is a special "extended match operator" that walks the chain of ancestry in objects all the way to the root until it finds a match (see http://msdn.microsoft.com/en-us/library/windows/desktop/aa746475(v=vs.85).aspx).

If you do not want to synchronize Groups:

1	Do not explicitly specify a value for the Group search filter.
2	Do not specify any target Group OUs (organizational units).

3	Ensure that the Universal Controller Start-up Properties file (**`uc.properties`**) contains the following property configuration: **uc.ldap.groups.filter_indirect=true** (If **uc.ldap.groups.filter_indirect=true**, any Groups synchronized indirectly - that is, through a User's **memberOf** attribute - will honor the Group Filter and Group Target OU List.)

Note

The **`uc.ldap.groups.single_parent_per_child`** start-up property should be set to **true** only if your Groups being synchronized from AD have at most one parent Group. When synchronizing Groups, the default Controller behavior is to copy the members of a Sub Group into the Parent Group. If this property is set to **true**, the Controller assumes that each Group has, at most, a single Parent Group and will use the Parent field on the Group definition to maintain the hierarchy instead of copying members.

SSL/TLS Secured LDAP (LDAPS)

Universal Controller supports the use of LDAPS instead of the non-encrypted LDAP connection offered in the Controller.

It requires setting up a truststore (keystore) and setting the following properties in the Universal Controller Start-up Properties (uc.properties) file:

- opswise.trustmanager.truststore
- opswise.trustmanager.truststore.password

You must make sure that the LDAP server's certificate exists in the truststore that is referenced by these two properties.

When these configurations have been made, use **`ldaps://`** for the URL prefix in the LDAP Settings Field Descriptions.

Single Sign-On Settings

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- Terminology
- Single Sign-On Login
  - Service Provider-Initiated Login
  - Identity Provider-Initiated Login
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  - Session Expired
  - Administrator Account
- Single Logout
  - User Sessions
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  - User Attribute Mapping
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- SAML Configuration
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  - SAML KeyStore
  - Java Cryptography Extension (JCE)
  - Debugging
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Overview

Note

The information provided on this page assumes you have a working knowledge of SAML Single Sign-On.

Universal Controller enables Web Browser Single Sign-On (SSO) through Security Assertion Markup Language 2.0 (SAML 2.0).

SAML 2.0 is an XML-based protocol for exchanging security information between a SAML Identity Provider and a SAML Service Provider.

As a SAML Service Provider, Universal Controller accepts authentication assertions from a configured SAML Identity Provider compliant with the SAML 2.0 Web Browser Single Sign-On profile.

SAML Single Sign-On eliminates the need for application-specific passwords. Universal Controller issues an authentication request to the configured Identity Provider, through the web browser, for any unauthenticated user accessing the Universal Controller web application through the SAML Login URL.

Universal Controller uses SAML Single Sign-On for authentication and User Provisioning. All user and group authorization must be configured within Universal Controller through Permission and Role assignment.

Terminology

IdP	Identity Provider (for example, Okta)	Third-party system that pre-authenticates SAML users.
SAML	Security Assertion Markup Language	SAML is an XML-based protocol for exchanging security information between a SAML Identity Provider and a SAML Service Provider.
SP	Service Provider (for example, Universal Controller)	Receives and accepts authentications via SAML Single Sign-On.
SSO	Single Sign-On	Method of authentication.

Single Sign-On Login

SAML Single Sign-On can be initiated by either Universal Controller, as the Service Provider, or the Identity Provider.

Only users designated with **Single Sign-On** as a Login Method can authenticate using SAML Single Sign-On. However, users designated with both **Standard** and **Single Sign-On** as a Login Method can continue to log into the Universal Controller using the standard application URL (see Logging In).

Service Provider-Initiated Login

Universal Controller, as a Service Provider, will initiate the SAML Single Sign-On login flow when an unauthenticated user accesses the web application through the following URL.

http(s)://<server:port>/uc/saml

Identity Provider-Initiated Login

Identity Provider-initiated SAML Single Sign-On begins at the Identity Provider, typically by accessing an application-specific Identity Provider URL. Once authenticated, the user will be taken to the Universal Controller web application.

Action URLs

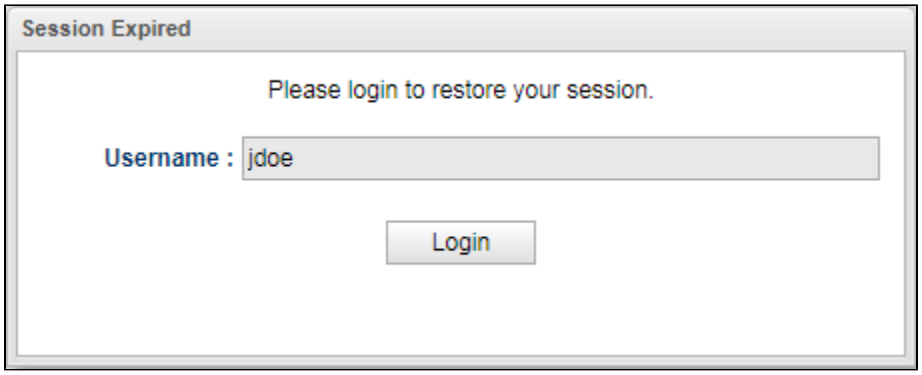
Any Action URL parameters on the URL used by the SAML-authenticated user to access the Universal Controller web application are restored when the Service Provider-initiated SAML SSO authentication flow has completed successfully and the user has been redirected back to the Universal Controller web application.

Note:

This is not applicable for an Identity Provider-initiated login.

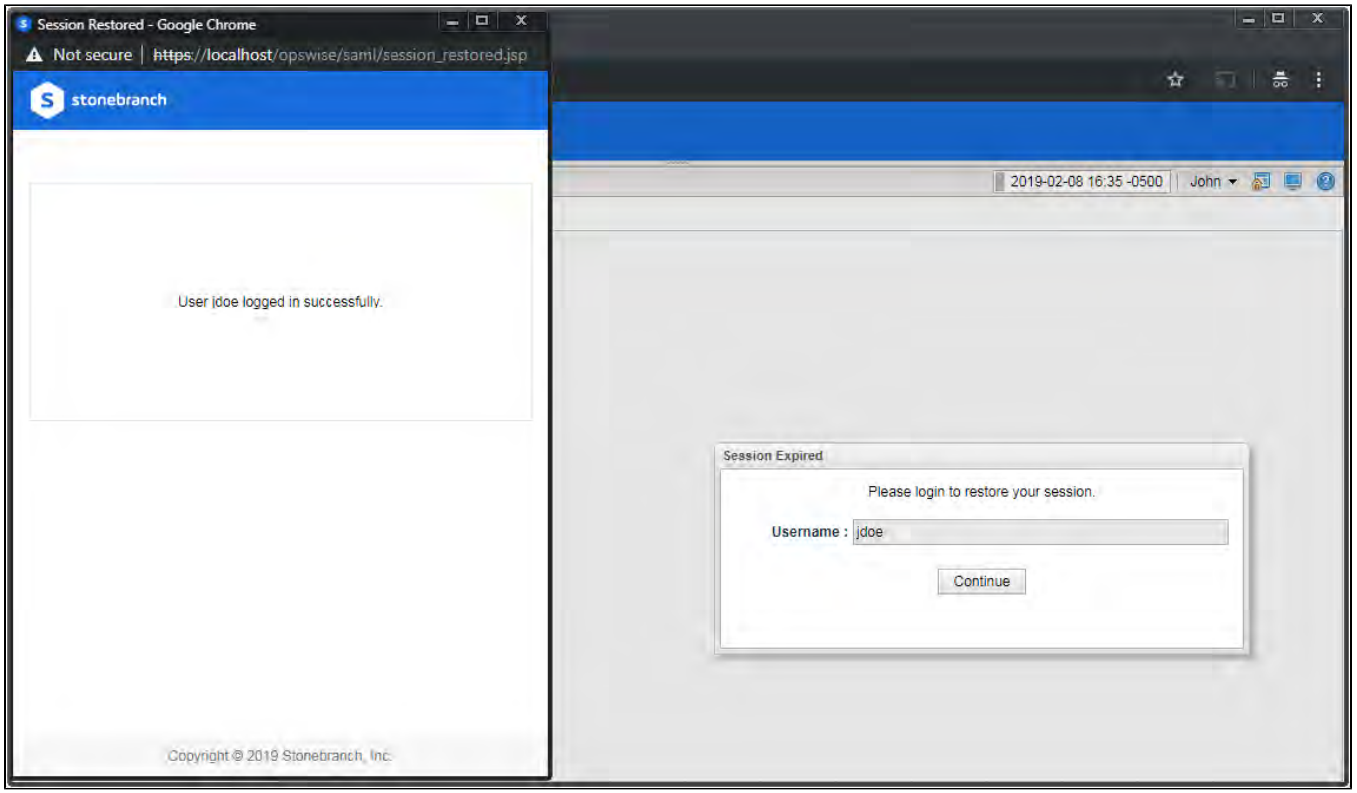
Session Expired

Universal Controller allows you to restore an HTTP session without leaving the application (or losing data) by prompting you to re-enter your login credentials in a Session Expired pop-up:

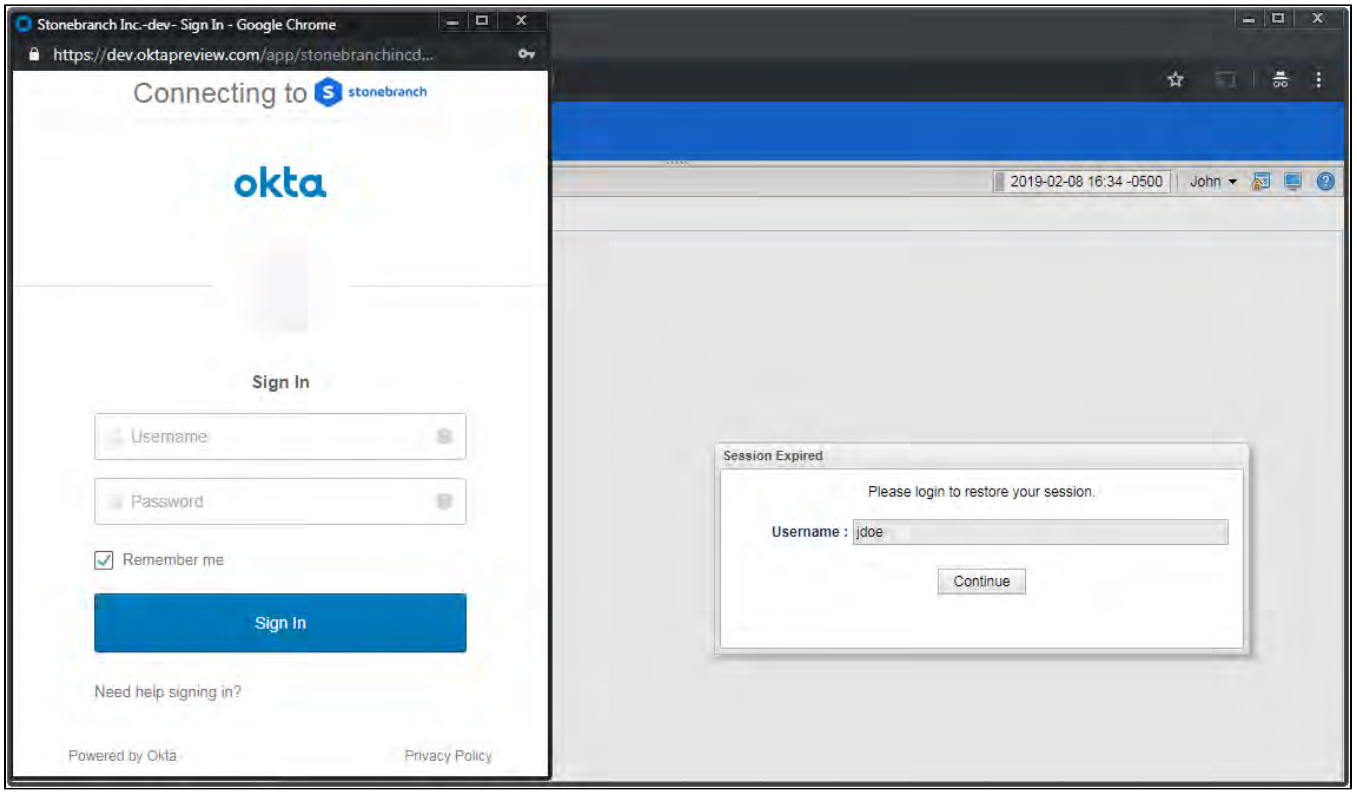


If you are a SAML-enabled user, the Controller allows you to initiate the SAML Single Sign-On authentication flow without leaving the application. On the Session Expired pop-up, instead of entering your login credentials, simply click the Login button to initiate the SAML SSO authentication flow..

If only your Universal Controller session has expired, and not your session with the Identity Provider, you are logged in without being prompted for your credentials. Click Continue on the original dialog to proceed, which closes the SAML SSO authentication flow window.



If your session with the Identity Provider has expired, you are prompted for its login credentials.



When the Identity Provider has authenticated you and the SAML SSO authentication flow has completed, click Continue on the original dialog to proceed, which closes the SAML SSO authentication flow window.

Administrator Account

Modification of the ops.admin account Login Method is not permitted; therefore, the account will always be accessible for cases where, for example, Single Sign-On Settings are incorrectly configured or the Identity Provider is inaccessible.

Single Logout

Universal Controller supports SAML Single Logout for SAML-authenticated users, in accordance with the SAML 2.0 Single Logout profile.

By initiating the Logout menu option, a SAML-authenticated user is initiating Single Logout.

The Single Logout profile terminates the session at the originating Service Provider (Universal Controller), the Identity Provider session, and, potentially, sessions at other Service Providers connected to the same Identity Provider session, depending on the Identity Provider implementation.

Note

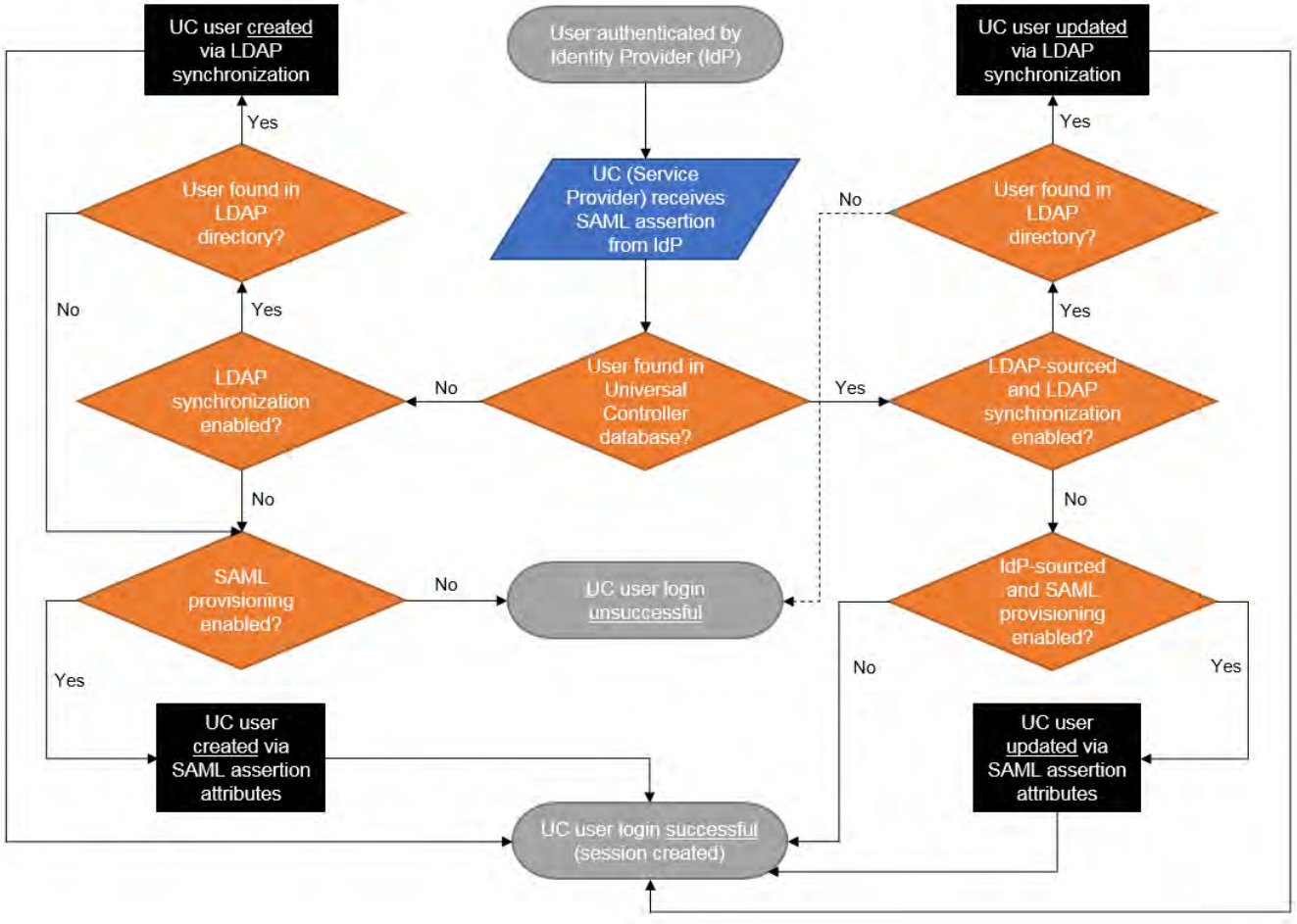
It is required that the configured Identity Provider metadata declares a Single Logout endpoint.

User Sessions

The administrative functionality in the user interface that allows for management of User Sessions is applicable only for local Universal Controller sessions; therefore, expiring a user's session through this interface is only expiring the local Universal Controller session.

User Provisioning

The following diagram illustrates the expectations in Universal Controller for provisioning users from attributes available in the SAML assertion:



As illustrated, when LDAP synchronization is enabled, provisioning of users through LDAP synchronization takes precedence over provisioning of users through the SAML assertion during the Single Sign-On process.

During the next scheduled LDAP refresh, consistent with locally created users and groups, any Identity Provider-sourced user or group matching a user or group synchronized from the LDAP automatically is converted to an LDAP-sourced user or group.

Once a user has been provisioned (created) in the Universal Controller database, its Source (ldap:dn or idp:remote-entity-id) determines how the user record is refreshed during the next login through single sign-on.

User Attribute Mapping

For Universal Controller to correlate SAML assertion attributes with Universal Controller user fields, Universal Controller must provide a way to configure a mapping between Universal Controller User fields and SAML assertion attributes.

The following Universal Controller user fields are mappable.

- User Id (Required)
  (This field automatically is mapped to the SAML Subject NameID from the SAML assertion and cannot be changed.)
- First Name (Required)
- Middle Name
- Last Name
- Email
- Title
- Department
- Manager
  (This field is a reference to another user and is mapped only if the attribute value contains the Name of a valid Universal Controller user.)
- Business Phone
- Mobile Phone
- Home Phone
- Active

Any user created by SAML assertion attributes, during the single sign-on process, is considered an Identity Provider-sourced user. See Attribute Mappings in Single Sign-On Settings.

User Field Defaults

Single Sign-On provisioned users are created with the following default field values:

Field	Value
User Password	random, 32-characters
Password Requires Reset	true
Login Method	Single Sign-On
Web Browser Access	- - System Default - -
Command Line Access	- - System Default - - Applies only to users designated to use the Standard login method.
Web Service Access	- - System Default - - Applies only to users designated to use the Standard login method.

Group Membership Attribute Mapping

An additional configuration is provided to allow for assigning group membership using the SAML assertion. Universal Controller allows configuring which SAML assertion attribute contains the user's group membership.

To support multiple groups, the attribute is multi-valued, where each attribute value specifies the Group Name of a Universal Controller group for which the user belongs. If the Universal Controller group is not already provisioned, it is provisioned automatically as an Identity Provider-sourced group.

If a group membership attribute mapping is specified, any time that an Identity Provider-sourced user authenticates using SAML Single Sign-On, its group membership will be updated based on the group attribute value in the accepted SAML assertion. The user will be added to, or removed from, groups accordingly.

SAML Configuration

Service Provider Metadata

Universal Controller is configured for automatic generation of Service Provider metadata. By default, the Service Provider Entity ID for a Universal Controller deployment is: https://uc.stonebranch.com/sp.

However, Universal Controller allows an administrator to customize the Service Provider Entity ID by specifying a Service Provider Entity ID Subdomain in the Single Sign-On Settings in the user interface.

For example, an Service Provider Entity ID Subdomain value of `dev` would allow for a Service Provider Entity ID of https://dev.uc.stonebranch.com/sp.

SAML Endpoints

To generate the SAML endpoints for the Service Provider metadata, an SP Entity Base URL for Universal Controller must be determined. By default, Universal Controller uses information from first request after the Controller has been initiated to automatically generate a Service Provider Entity Base URL in the format `scheme://server:port/contextPath`.

For example: https://example.stone.branch:443/uc

To configure the SP Entity Base URL to a specific value, an administrator can specify the Service Provider Entity Base URL from the Single Sign-On Settings in the user interface.

The following table documents the SAML endpoints, and their supported bindings, contained within the Universal Controller Service Provider metadata.

SAML Profile	Binding	Endpoint
Web Single Sign-on	HTTP-POST, HTTP-Artifact	scheme://server:port/contextPath/saml/SSO
Single Logout	HTTP-POST, HTTP-Redirect	scheme://server:port/contextPath/saml/SingleLogout

Universal Controller provides a Service Provider Metadata link, from the Single Sign-On Settings, for downloading the Universal Controller Service Provider metadata file.

Alternatively, you can download the metadata file directly using the following URL:

http(s)://<server:port>/uc/saml/metadata

Identity Provider Metadata

Universal Controller requires the Identity Provider configuration provided in the form of an IdP metadata XML file.

You can download the Identity Provider metadata file from the Identity Provider and save it under the Tomcat `conf/` directory, in a `saml/` subdirectory.

You can specify the location of the Identity Provider metadata file in the Single Sign-On Settings Details of the user interface. By default, on initial start-up, the Controller automatically populates the Identity Provider metadata file setting with a value of `${catalina.base}/conf/saml/idp.xml`.

For example, if `${catalina.base}` resolves to `/opt/tomcat`, the Identity Provider metadata file setting would be populated with `/opt/tomcat/conf/saml/idp.xml`.

SAML KeyStore

SAML message exchanges required for the Web Browser SSO profile and the Single Logout profile involve usage of cryptography for the signing and encryption of data.

The Universal Controller requires a single JKS keystore that contains all private and public keys. The keystore must have one default private key.

To create the JKS keystore file, with the default private key, assuming your Identity Provider does not require keys be signed by a specific certification authority, you can use the Java utility keytool command to generate a self-signed key, entering the distinguished name information when prompted.

```
keytool -genkeypair -keyalg RSA -sigalg SHA256withRSA -alias ucsaml -keypass ucsaml -keystore samlKeystore.jks -storepass ucsaml -storetype JKS
```

To import a key signed by a certification authority, which are typically provided in .p12/.pfx format (or can be converted to .p12/.pfx format using OpenSSL), you can use the following keytool command.

```
keytool -importkeystore -srckeystore key.p12 -srcstoretype PKCS12 -srcstorepass password -alias alias -destkeystore samlKeystore.jks -destalias ucsaml -
destkeypass ucsaml
```

To determine the alias available in the p12 file, you can use the following command.

```
keytool -list -keystore key.p12 -storetype pkcs12
```

If your Identity Provider metadata is signed, to verify trust of the signature, Universal Controller will use all keys found in the configured keystore. To import the public certificate of the metadata signature, you can use the following keytool command.

```
keytool -importcert -alias alias -keystore samlKeystore.jks -file signature.cer
```

The location of the KeyStore File can be specified from the Single Sign-On Settings in the user interface. However, by default, Universal Controller automatically populates the KeyStore File setting with a value of `${catalina.base}/conf/saml/samlKeystore.jks` on initial start-up.

For example, if `${catalina.base}` resolves to `/opt/tomcat`, the KeyStore File setting would be populated with `/opt/tomcat/conf/saml/samlKeystore.jks`.

The JKS keystore password, the default private key alias, and the default private key password can also be specified from the Single Sign-On Settings in the user interface. Each of these settings are populated with a default value of `ucsaml` on initial start-up.

If your Identity Provider requires that you upload the public key certificate for the SAML Single Logout profile, you can export the certificate from the JKS keystore as follows.

```
keytool -exportcert -alias ucsaml -file ucsaml.cer -keystore samlKeystore.jks -storepass ucsaml -storetype JKS
```

Java Cryptography Extension (JCE)

Universal Controller is configured to use signature algorithm SHA256withRSA and digest method algorithm SHA-256.

Use of SAML Single Sign-On requires installation of the Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files for JDK/JRE 8 to remove limitations on cryptography capabilities.

Note

Starting with Java 1.8.0_162, JCE unlimited policy is enabled by default. You no longer need to install the policy file in the JRE or set the security property crypto.policy.

Debugging

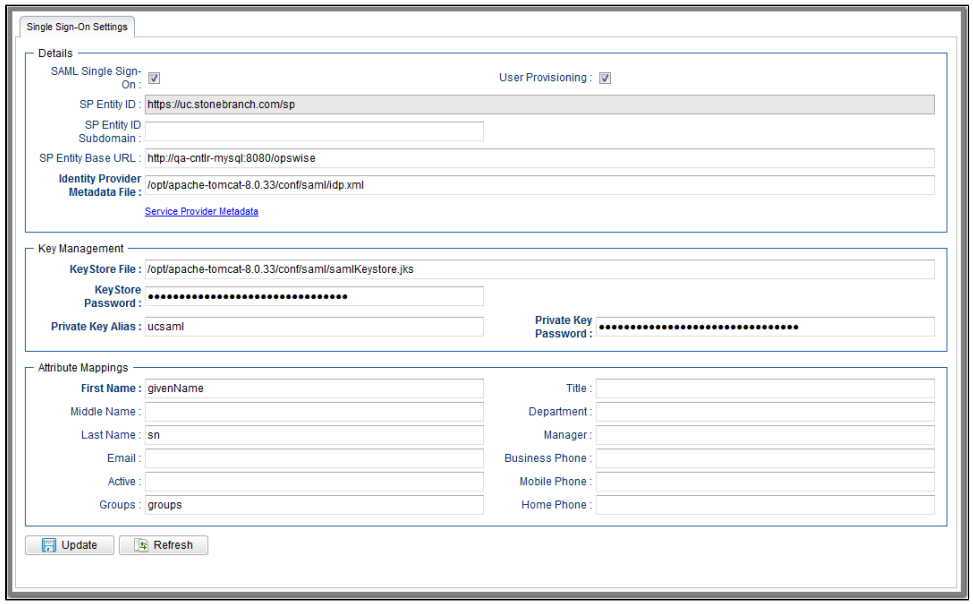
The saml.log.level property can be configured in the uc.properties to enable debug logging for the SAML framework. However, as a best practice, saml.log.level should remain at INFO under normal operation.

Single Sign-On Settings

An administrator can turn on/off and configure SAML Single Sign-On through the user interface.

Step 1

From the Administration navigation pane, select **Configuration > Single Sign-On Settings**. The Single Sign-On Settings page displays.



Step 2	Enter / select your Single Sign-On Settings, using the field descriptions below as a guide. • Required fields display in **boldface**. • Default values for fields, if available, display automatically.
Step 3	Click the **Update** button.

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

Single Sign-On Settings Field Descriptions

The following table describes the fields and buttons that display in the Single Sign-On Settings.

Field Name	Description
Details	This section contains detailed information on the Single Sign-On settings.
SAML Single Sign-On	If enabled, turns on SAML Single Sign-On. If disabled, all fields are read-only.
User Provisioning	If enabled, turns on the provisioning of users through SAML assertion attributes.
SP Entity ID	Read-only; Unique identifier of the Universal Controller Service Provider.
SP Entity ID Subdomain	Customize the SP Entity ID with a unique subdomain.
SP Entity Base URL	Base URL to construct SAML endpoints from; must be a URL with protocol, server, port. and context path. If one is not specified, it defaults to values from the initial request in this format: `scheme://server:port/contextPath`
Identity Provider Metadata File	Identity Provider metadata file location.
Service Provider Metadata	Link to download the Service Provider metadata for the Universal Controller node.
Key Management	
KeyStore File	Keystore file location.
KeyStore Password	Password used to protect the integrity of the keystore. Default is ucsaml.
Private Key Alias	Alias of the private key (with either self-signed or CA-signed certificate) used to digitally sign SAML messages. Default is ucsaml.
Private Key Password	Password used to protect the integrity of the private key. Default is ucsaml. See SAML KeyStore.

Attribute Mappings	If User Provisioning is enabled; This section allows you to configure a mapping between user fields and attributes from the attribute statement of a SAML assertion. It is displayed only when User Provisioning is enabled. See User Attribute Mapping for more details. In addition to user fields, you can specify an attribute mapping for Groups allowing for automatic provisioning of a user's group membership. See Group Membership Attribute Mapping for more details.
First Name	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the First Name of the user.
Middle Name	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Middle Name of the user.
Last Name	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Last Name of the user.
Email	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Email of the user.
Active	Name of an attribute, of type `xs:boolean`, `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Active condition of the user. Non-boolean type values that evaluate to **true** are "true", "1", "yes", and "on." All other non-boolean type values evaluate to **false**.
Groups	Name of a multi-valued attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Group Name of each group that the user is a member of.
Title	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Title of the user.
Department	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Department of the user.
Manager	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Name of the Manager of the user.
Business Phone	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Business Phone of the user.
Mobile Phone	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Mobile Phone of the user.
Home Phone	Name of an attribute, of type `xs:string` or `xs:any`, from the attribute statement of the SAML assertion containing the Home Phone of the user.
Buttons	This section identifies the buttons displayed above and below the Single Sign-On Settings that let you perform various actions.
Update	Saves updates to the record.
Refresh	Refreshes any dynamic data displayed in the Single Sign-On Settings.

Default Configuration

Upon initial start-up of Universal Controller, a default Single Sign-On Settings record is created and associated with the Universal Controller node by node id. The settings are specific to the Universal Controller node, as the SP Entity ID, Base URL, and File paths may differ between each Universal Controller node. See Single Sign-On Settings Field Descriptions, above, for the default configuration.

Security

Single Sign-On Settings can be viewed only by users with the ops_admin role, regardless of Navigation Visibility; therefore, only users with the ops_admin role can update Single Sign-On Settings.

Bulk Import/Export

Any Single Sign-On Settings record in the database that has a corresponding Universal Controller node is exported to `ops_single_sign_on.xml` during the Bulk Export server operation.

Single Sign-On Settings being updated through the Bulk Import server operation are applied immediately; however, you can update the Single Sign-On Settings only for the node you are performing the Bulk Import on.

Troubleshooting

NameID

The SAML Subject NameID from the SAML assertion received from the Identity Provider correlates directly to the User ID field of a user record in the Universal Controller database.

- If User Provisioning is off, the NameID must match with the User ID field of an existing user record in the Universal Controller database.
- If User Provisioning is on, any provisioned user record will be assigned a User ID equivalent to the NameID.

Login Errors

Universal Controller Uninitialized	While the Universal Controller web application is initializing, the user login flow cannot proceed. Any users attempting to authenticate with SAML at this time receive the following error: Universal Controller is being initialized. Please try again later.
User Account Not Found	Any SAML-authenticated user who cannot be linked to a user account in the Universal Controller database is prohibited from accessing the application and receives the following error: User 'username' not synchronized with Universal Controller. Please check with your administrator. Additionally, the uc.log will contain the following warning: User 'username' authenticated by identity provider 'remote-entity-id' not synchronized with a Universal Controller account.
User Account Not Active	Any SAML-authenticated user linked to a Universal Controller user account that is not Active is prohibited from accessing the application and receives the following error: User 'username' not synchronized with Universal Controller. Please check with your administrator. Additionally, the uc.log will contain the following warning: User 'username' authenticated by identity provider 'remote-entity-id' is synchronized with an inactive Universal Controller account.
Login Method	Any SAML authenticated user linked to a Universal Controller user account that is not designated to use Single Sign-On login method is prohibited from accessing the application and receives the following error: User 'username' not synchronized with Universal Controller. Please check with your administrator. Additionally, the uc.log will contain the following warning: User 'username' authenticated by identity provider 'remote-entity-id' is not permitted to use Single Sign-On login method.
User Account Locked	Any SAML-authenticated user linked to a Universal Controller user account that is locked is prohibited from accessing the application and receives the following error: User account 'username' is locked. Please check with your administrator.
No Web Browser Access	Any SAML-authenticated user linked to a Universal Controller user account designated with the Single Sign-On login method, but without Web Browser Access, is prohibited from accessing the application and receives the following error: User 'username' not permitted to login through the web browser. Please check with your administrator.

Authentication Statement Too Old	If users already are authenticated with their Identity Provider, depending on how long their Identify Provider allows them to stay authenticated, they could experience an "Error validating SAML message" authentication error when signing into the Universal Controller through single sign-on. If users are experiencing this error, search the uc.log for the following message: `Authentication statement is too old to be used with value 2019-08-15T19:22:56.312Z` Upon confirming the presence of the above message, review property saml.maxAuthenticationAge and adjust accordingly. This property allows you to set the maximum time between a user's authentication and processing of an authentication statement, which by default is 7200 seconds.

Data Backup - Purge

- Overview
- Purge Rules for Task Instances
  - Task Instance Status
  - Purging by Retention Duration
- Creating a Data Backup / Purge Record
  - Data Backup / Purge Details
  - Data Backup / Purge Details Field Descriptions
- Running a Data Backup / Purge Manually
- Importing Backed Up / Purged Data into the Controller
- Returning Virtual Resources for Purged Task Instances in Failure Status

Overview

Universal Controller maintains a record of all system activity, including:

- Audits
- Activity
- History

The Data Backup / Purge feature allows you to configure automatic backups and/or purges of some or all of the Controller activity data. Depending on your organization's needs, you should schedule regular data backups. Depending on the volume of your installation, the amount of data in your Controller database could become unwieldy if you do not schedule regular purges of old data.

The data is written to XML files in the directory you specify.

Note

For instructions on how to purge user-created Controller records, see Purging Old Versions of Records.

Purge Rules for Task Instances

The following rules apply for the purging of task instances.

Task Instance Status

A task instance (including a workflow task instance) can be purged only if it is in a status greater than 99:

- 110 (In Doubt)
- 120 (Start Failure)
- 125 (Confirmation Required)
- 130 (Cancelled)
- 140 (Failed)
- 180 (Skipped)
- 190 (Finished)
- 200 (Success)

A task instance within a workflow cannot be purged until its workflow task instance has been purged.

A workflow task instance cannot be purged if one or more of its task instances is in a status other than Skipped, Finished, or Success, because that will cause the workflow to be in a status which will not qualify it to be purged (for example: Running, Running/Problems), and therefore none of the task instances within the workflow will qualify for purge.

Purging by Retention Duration

If Purge By Retention Duration has been specified for a trigger or a task, and the Purge By Retention Duration checkbox has been selected in the Data Backup / Purge Details, all task instances launched by the trigger or task are eligible to be purged from the database as soon as the retention duration time specified in the trigger or task has been met.

When a purge is run, any task instances eligible to be purged by retention duration will be purged regardless of the Days Older Than value specified in the Purge Details.

Note

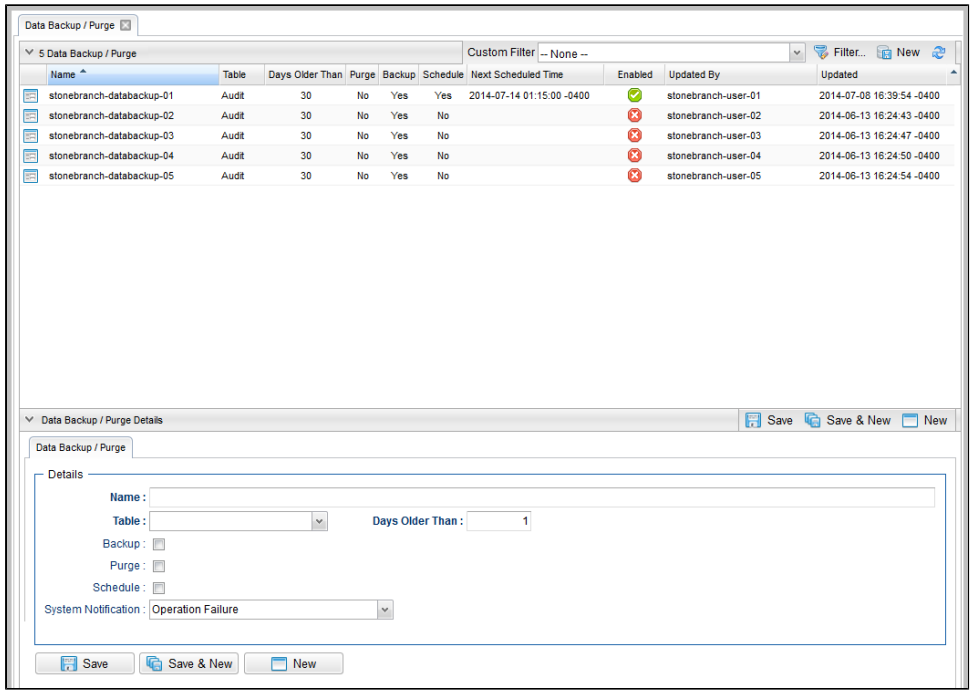
The Trigger Level (Purge By Retention Duration) feature is used for selectively purging instances earlier than the System Level (Days Older Than) purge and not intended for retaining instances longer than the System Level purge. The System Level purge will not take into consideration the Retention Duration and, therefore, setting a trigger Retention Duration longer than the configured System Level purge will not retain those instances longer.

Creating a Data Backup / Purge Record

Step 1

From the Administration navigation pane, select **Configuration > Data Backup / Purge**. The Data Backup / Purge list displays.

Below the list, Details for a new Data Backup / Purge record displays.



Step 2	Enter / select Details for a new Data Backup / Purge record, 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	If you want the backup / purge to run automatically, enable the **Schedule** field and specify how often and what time it should run. Otherwise, you can run it manually.
Step 4	Click a **Save** button to save the record. The record is added to the database, and all buttons and tabs in the Data Backup / Purge Details are enabled.

Note

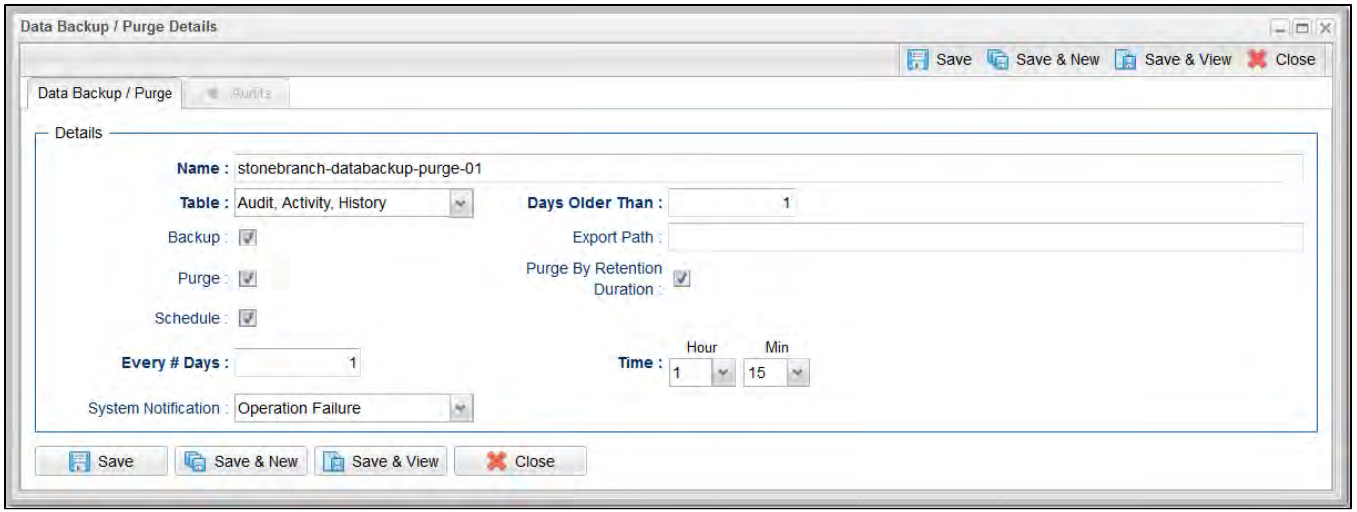
To open an existing record on the list, either:

- 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).

Data Backup / Purge Details

The following Data Backup / Purge Details is for an existing Data Backup / Purge record.

Depending on the values that you enter / select for these fields, more (or less) fields may display. See the field descriptions, below, for a description of all fields that may display in the Data Backup / Purge Details.



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

Data Backup / Purge Details Field Descriptions

The following table describes the fields, buttons, and tabs that display in the Data Backup / Purge Details.

Field Name	Description
Details	This section contains detailed information about the record.
Name	Name of this backup specification.
Table	Specifies which records you want to back up and/or purge: • Audit • Activity • History
Days Older Than	Allows you to specify the minimum number of days you wish to retain data. The process will run according to the schedule you specify, only processing data that is older than the number of days you specify in this field.
Backup	If enabled, the process will write all the selected data to XML files.

Export Path	If Backup is enabled, specifies the path to the directory to which you want the backed up data written. The data must be backed up to a location on the server's file system. It is written to a separate XML file for each record type, as shown in the following examples:
	`Audit:`
	`ops_audit_Sat_Apr_30_08_30_00_PDT_2011.xml`
	`Activity:`
	`ops_exec_sleep_Sat_Apr_30_08_30_00_PDT_2011.xml`
	`ops_exec_unix_Sat_Apr_30_08_30_00_PDT_2011.xml`
	`ops_exec_workflow_Sat_Apr_30_08_30_00_PDT_2011.xml`
	`History:`
	`ops_history_Sat_Apr_30_08_30_00_PDT_2011.xml`
	Note
	If no path is specified, the system default path (**opswise_backups** under the Tomcat directory) is used, unless an alternate path is specified in the Universal Controller system property Data Backup/Purge Export Path. If a path is specified but does not exist as an "absolute" path, it will be assumed to be a "relative" path from Tomcat home.

Purge	If enabled, the process will purge the selected data from your Universal Controller database.

Purge By Retention Duration	Specification for whether task instances qualifying to be purged by retention duration should be purged.
Schedule	If enabled, displays additional fields that allow you to specify an automated backup and/or purge schedule. If you do not select schedule, you must manually run the backup / purge process.
Next Scheduled Time	System-supplied; If Data Backup/Purge is enabled; the next scheduled time the that backup / purge process will run, based on the specifications in your schedule.
Every # Days	If Schedule is enabled, specifies the frequency (in number of days) of the backup / purge process. Default is 1.
Time	If Schedule is enabled, specifies the time of the backup / purge. Use 24:00 hour time. Note When enabling a Data Backup / Purge, or updating the Time for an enabled Data Backup / Purge, the backup / purge process will be scheduled for the specified Time on the current day if the current time is on or before the specified Time. Otherwise, the backup / purge process will be scheduled for the specified Time on the next day.
System Notification	Specification for whether or not to receive system notifications for Data Backup / Purge operations. Options are: • --None -- • Operation Failure • Operation Success/Failure • Operation Success Note In order to receive system notifications, you must provide an email address in the Administrator Email Address system property and select the Use for System Notifications field on an Email Connection.
Metadata	This section contains Metadata information about this record.
UUID	Universally Unique Identifier of this record.
Updated By	Name of the user that last updated this record.
Updated	Date and time that this record was last updated.
Created By	Name of the user that created this record.
Created	Date and time that this record was created.
Buttons	This section identifies the buttons displayed above and below the Data Backup / Purge Details that let you perform various actions.
Save	Saves a new record in the Controller database.
Save & New	Saves a new Data Backup/Purge record in the Controller database and redisplays empty Details so that you can create another Data Backup/Purge record.
Save & View	Saves a new Data Backup/Purge record in the Controller database and continues to display that record.

New	Displays empty (except for default values) Details for creating a new record.
Update	Saves updates to the record.
Enable	Enables these Backup / Purge instructions so that they will be processed by the Controller.
Disable	Disables these backup / purge instructions so they will not be processed by the Controller.
Run	Manually runs the backup / purge instructions.
Terminate	Terminates a running Data Backup/Purge operation.
Delete	Deletes the current record.
Refresh	Refreshes any dynamic data displayed in the Details.
Close	For pop-up view only; closes the pop-up view of this record.
Tabs	This section identifies the tabs across the top of the Data Backup / Purge Details that provide access to additional information about the record.
Audits	Lists audits created for all scheduled runs of this data backup / purge operation.

Running a Data Backup / Purge Manually

If you want to manually run a data backup or purge, either:

- On the Backups list, right-click the **Name** of the Data Backup / Purge that you want to run and click **Run**.
- Display the Details of the Data Backup / Purge that you want to run and click the **Run** button.

Importing Backed Up / Purged Data into the Controller

If you want to import any of the XML files created by a Data Backup / Purge, you can copy the XML file(s) into the bulk export output path and run bulk import. See Running an Import.

Returning Virtual Resources for Purged Task Instances in Failure Status

Task instances that have their **Hold Resources on Failure** field enabled will hold their renewable virtual resources if the task instance is in Failed status.

However, when these task instances are purged, the virtual resources are returned.

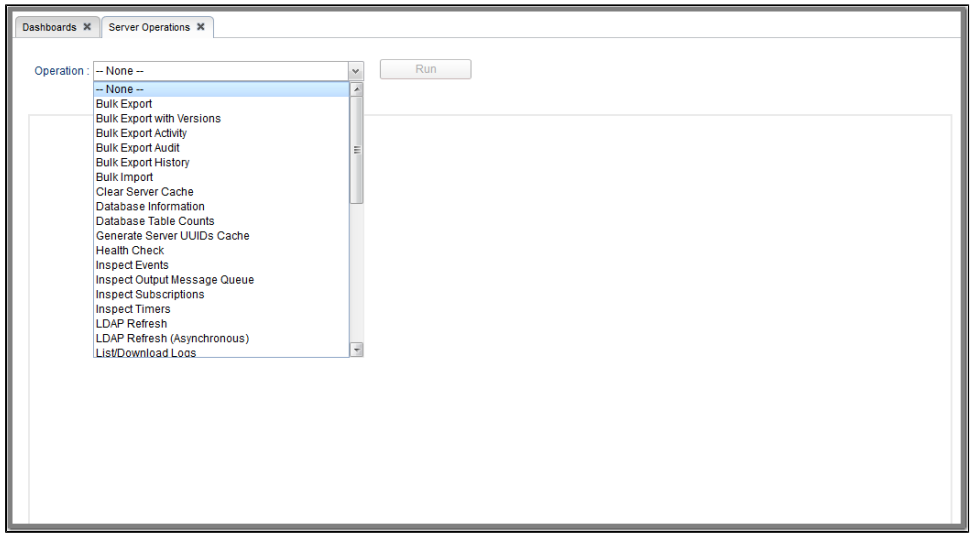
Server Operations

- Overview
- Running a Server Operation
- Server Operation Completion
- Server Operation Status
- Server Operation Timeout
- Server Operations Descriptions
- Universal Controller Database Tables

Overview

Universal Controller provides a set of server operations that help you maintain and administer your Controller installation. Many of the operations, as noted, should be run only by Technical Support or upon request by Technical Support.

Running a Server Operation

Step 1	From the Administration navigation pane, select **Configuration > Server Operations**. The Server Operations list displays. 
Step 2	Select an operation from the drop-down list and click **Run**.

Server Operation Completion

When a server operation has been run and completed, the Controller issues an INFO-level log message.

For example:

```
2018-03-31-09:24:58:957 -0400   INFO [http-8080-exec-4] Running Server Operation: Bulk Export
```

```
2018-03-31-09:25:12:357 -0400  INFO [http-8080-exec-4] Server Operation completed: Bulk Export in 1 Minute 37 Seconds
```

Server Operation Status

The status for a completed Server Operation is either Success or Failed. The Audit Status field for Server Operations can have one of the following values: Invoked, Failed, or Success.

All Server Operations can fail if the user invoking the Server Operation does not have sufficient permission or if the Server Operation is limited to one execution per node and it is already running.

Most Server Operations will complete successfully; however, if errors occur executing the Server Operation, the Audit Status field is set to Failed, and error messages may be added to the Additional Information field.

The Server Operation duration message will be added to the Audit Additional Information field regardless of the Server Operation status. For example:

```
Server Operation 'LDAP Refresh' completed in 0 Seconds at 2018-06-11 12:46:01 -0400
```

Server Operation Timeout

For potentially long running server operations, such as Bulk Import and Bulk Export, we set a request timeout of 30 minutes.

However, some browsers may timeout earlier, regardless. In the case where a server operation has timed out, you will see an error similar to the following in the Universal Automation Center Console:

```
"No response from 'Bulk Import' server operation; check server log for details."
```

In the case of a request timeout, the server operation will continue to run on the server. You will have to confirm completion of the server operation from either the server log, **uc.log**, or from the Audits list.

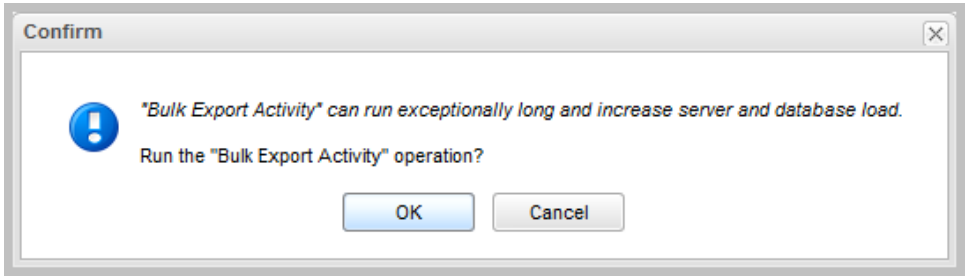
View the log for the start and completion of the server operation, as well as any warnings/errors logged in between.

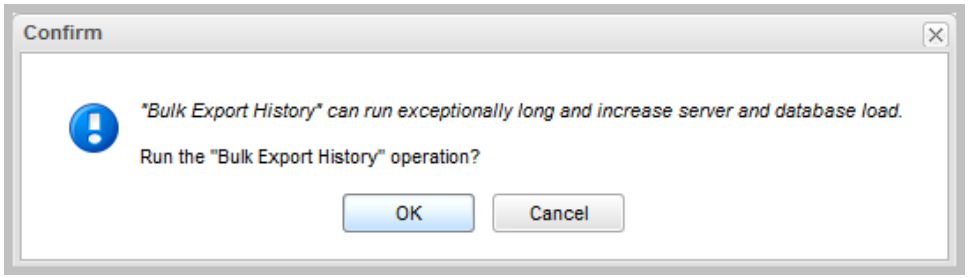
```
2018-03-31-09:24:58:957 -0400   INFO [http-bio-8080-exec-4] Running Server Operation: Bulk Import
...
2018-03-31-09:25:12:357 -0400   INFO [http-bio-8080-exec-4] Server Operation completed: Bulk Import in 11 Minutes 57 Seconds
```

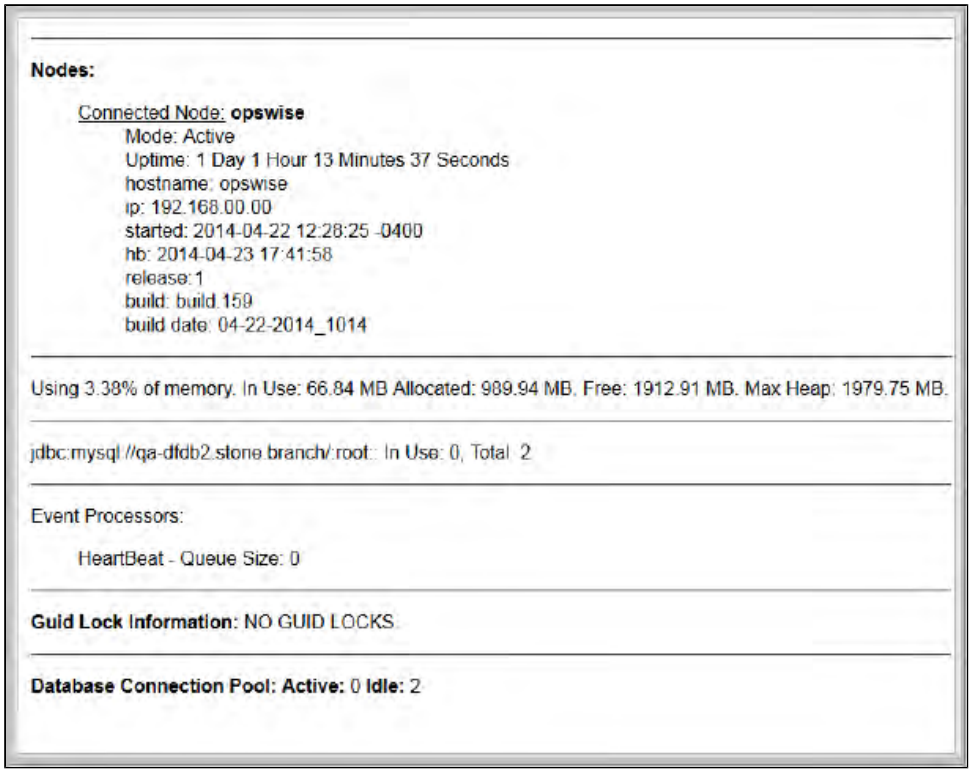
Alternatively, you can view the server operation audit record; however, the log usually provides the most detailed information.

Server Operations Descriptions

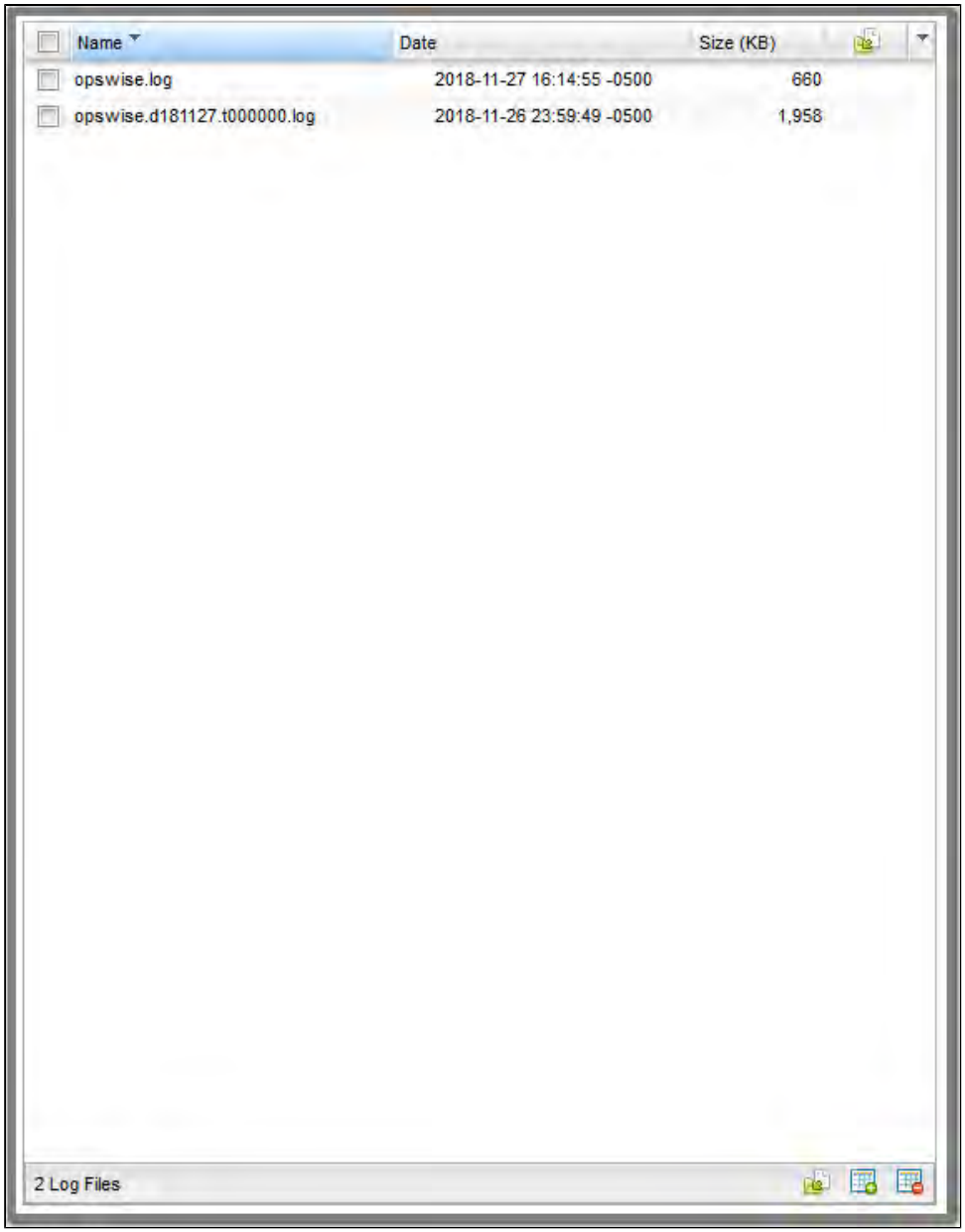
The following table describes and, where appropriate, provides links for each server operation.

Script	Description and Links
Bulk Export	Exports all current record definitions, without versions, when migrating data to a new Universal Controller deployment.
Bulk Export Activity	Exports all current Activity data from multiple Universal Controller database tables. Note In order to run this server operation, the Bulk Export Activity Permitted Universal Controller system property must be set to true. If you choose to run this server operation, the following confirmation pop-up displays: 
Bulk Export Audit	Exports all current Audit records when migrating data to a new Universal Controller deployment.

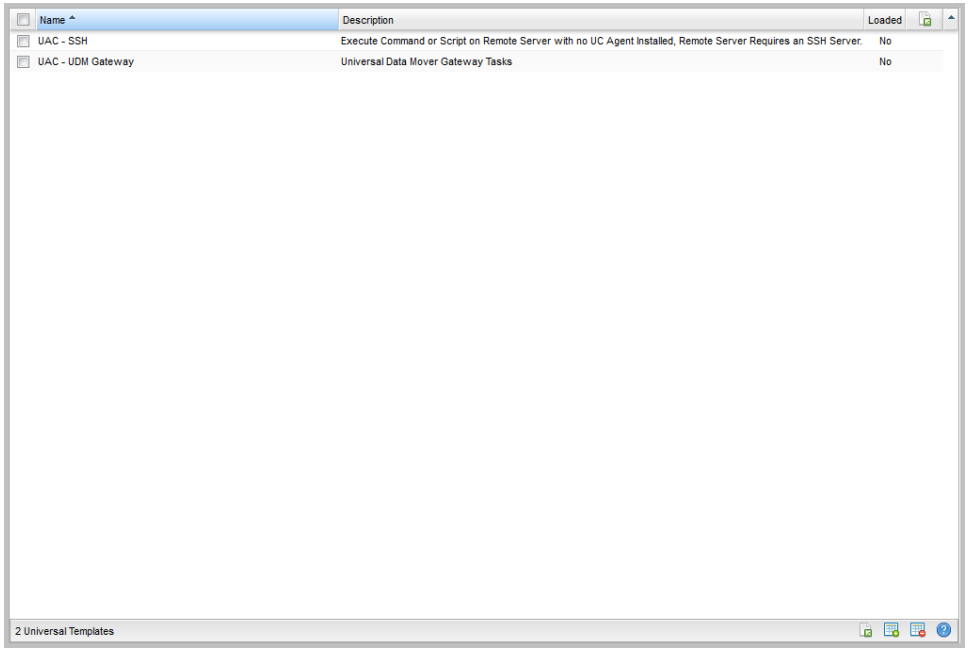
Bulk Export History	Exports all current History records when migrating data to a new Universal Controller deployment. If you choose to run this server operation, the following confirmation pop-up displays: 
Bulk Export with Versions	Exports all current records along with older (non-current) versions of record definitions when migrating data to updated software (see Upgrading Universal Controller from 5.2.0).
Bulk Import	Imports all data from an exported file when migrating data to updated software (see Upgrading Universal Controller from 5.2.0).
Clear Server Cache	Clears the internal server cache. You can use this operation if you are experiencing unexpected behavior with the Controller system. For example, Technical Support may ask you to first run this operation to clear the server cache, then clear your browser cache.
Database Information	Displays the following information for the Controller database: • Type: MYSQL • Database Name: db_name • Database Product Name: MySQL • Database Product Version: 8.0.11 • Driver Name: MySQL Connector/J • Driver Version: mysql-connector-java-8.0.12 (Revision: 24766725dc6e017025532146d94c6e6c488fb8f1) • Configured JDBC URL: jdbc:mysql://hostname:port/ • Adjusted JDBC URL: jdbc:mysql://hostname:port/db_name?useUnicode=true&serverTimezone=US/Eastern&socketTimeout=1800000 • Connection Pool: Server (0/3) • Connection Pool: Reserved (0/3) • Connection Pool: Client (0/5)
Database Table Counts	Displays the following information for Universal Controller database tables: • Largest table • Number of tables • Number of rows • Number of rows in each table See Universal Controller Database Tables, below, for a description of all tables.
Disable Task Instance Business Service Normalization	Disables normalization of Business Service membership for all: • New Task Instance and History records. • Existing Task Instance and History records if it is still in progress. All previously normalized Business Service membership records will not be removed until they qualify for Activity or History purge. Also, the Task Instance Normalize Business Service Membership property will be set to Disabled.

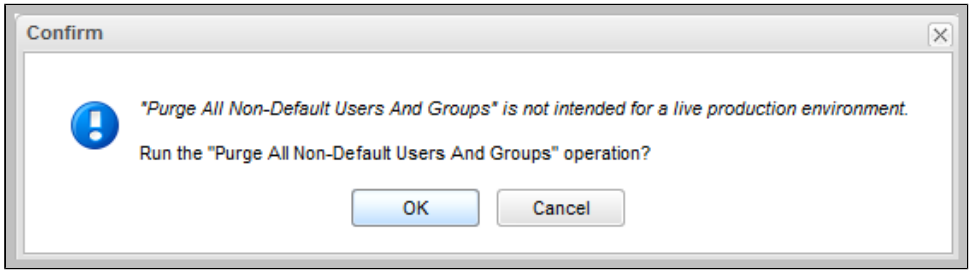
Enable Task Instance Business Service Normalization	Commence normalization of Business Service membership for all existing Task Instance and History records, and begin normalizing Business Service membership for all new Task Instance and History records. • Until all History and Task Instance Business Service membership normalization has completed for existing Task Instance and History records, the Task Instance Normalize Business Service Membership Universal Controller system property will be set to Enabled/Normalizing. • When all History and Task Instance Business Service membership normalization has completed for existing Task Instance and History records, the Task Instance Normalize Business Service Membership property will be set to Enabled/Normalized. Note When deciding on enabling Business Service normalization, it should be noted that there is trade-off between the query performance on Task Instance/History Lists and the added insertion of normalization data at Task Instance/History record creation time. If the Controller is restarted and the Task Instance Normalize Business Service Membership property is Enabled/Normalizing, the Controller will resume normalization of Business Service membership for all existing Task Instance and History records.
Generate Server UUIDs Cache	For use only by Technical Support personnel or when you are requested to run it by Technical Support.
Health Check	Displays information about the current instance of the Controller. 
Inspect Events	For use only by Technical Support personnel or when you are requested to run it by Technical Support.

Inspect Output Message Queue	For use only by Technical Support personnel or when you are requested to run it by Technical Support.
Inspect Subscriptions	For use only by Technical Support personnel or when you are requested to run it by Technical Support.
Inspect Timers	For use only by Technical Support personnel or when you are requested to run it by Technical Support.
LDAP Refresh	If LDAP is configured for this installation, it refreshes every 24 hours. This server operation forces a refresh. The refresh writes all Controller log entries to the user interface as well as to the Controller log, and the response will not be returned until the process completes. If you estimate the refresh could take a considerable amount of time, we recommend you use LDAP Refresh (Asynchronous).
LDAP Refresh (Asynchronous)	If LDAP is configured for this installation, it refreshes every 24 hours. This server operation forces a refresh. The refresh is performed in the background and sends Controller log entries to the Controller log.
List/Download Logs	Lists (and optionally lets you download) any existing UC log files for the Controller node that this operation is executed on. The list identifies the name, last modification date, size of each log file, and - when you hover over the log file entry on the list - an icon that lets you download that file.



The icons at the bottom of the list let you perform the following:

	• Download selected log files. • Select all log files. • Deselect all log files. (You also can select / deselect all log files by clicking the Name checkbox at the top of the list.)
List/Load Built-In Universal Templates	Lists Built-In Universal Templates and indicates which ones are loaded. The list supports loading individual or multiple built-in Universal Templates.  You can select / deselect the templates to load by clicking the Name checkbox (loads all templates) or one or more individual checkboxes at the top of the list. The icons at the bottom of the list let you perform the following: • Load selected universal templates • Select all universal templates • Deselect all universal templates • Access the online documentation for Built-In Universal Templates If you choose to load one or more templates, a confirmation pop-up displays.
List/Load Template Workflows	Lists Template Workflows and indicates which ones are loaded. The list supports loading individual or multiple Template Workflows.
Load Demonstration D efinitions	Loads base demonstration data into your database (for example: workflows, tasks, triggers).
Memory Usage	Displays a summary of Controller memory usage.
Overdue Timers Delete	Deletes any overdue timers, as listed by the Overdue Timers List operation.

Overdue Timers List	Lists any timers that are overdue (normally, no timers should be overdue).
Pause Cluster Node	Pauses the Controller, which prevents it from processing tasks and events. If an event or task is already running when you run this operation, the event or task will complete. The Controller remains in a paused state until you run the Resume Cluster Node operation.
Purge All Non-Default Users And Groups	Purges all non-default Users and Groups and their associated data. There is one default User: Administrator (ops.admin). There are two default Groups: Administrator Group and Everything Group. This server operation will also clear the following fields: • Manager field for the Administrator user if it references a non-default user. • Manager field for the Administrator Group and/or Everything Group if it references a non-default user. • Parent field for the Administrator Group and/or Everything Group if it references a non-default group. The following is recommended before running this server operation: • Disable any triggers that are currently enabled by a non-default user. • Unassign the Execution User for any triggers that are currently assigned a non-default user as the Execution User. • Complete any active task instances that are currently assigned a non-default user as the Execution User. Note To run this server operation, the Purge All Non-Default Users And Groups Permitted Universal Controller System Property must be set to true. If you choose to run this server operation, the following confirmation pop-up displays: 
Purge History	Purges all records from the History table (ops_history). Any time a task instance goes into an end status (Cancelled, Failed, Skipped, Finished, Success), a copy of it is written to the History table. You can view your History table by selecting **Automation Center > Task Instances > History** from the navigation pane. Note If you do not need to keep or back up your task instance history, we recommend that you run this operation periodically; otherwise, make sure you schedule a routine Data Backup/Purge for history by selecting **Administration > Data Backup/Purge** from the navigation pane. Executing a Data Backup/Purge of an extremely large History table can seriously degrade Controller system performance.
Purge Instances	Purges everything in the All Task Instances table (ops_exec), which contains all system activity, including task instances in any status (including end statuses). Records in the All Task Instances table (ops_exec) remain there until they are purged. Warning Running this operation will purge any live data; that is, task instances that have not completed.

Purge Logs and Cache	Sends a request to all active Agents to purge their logs and cache.
Purge Versions	Purges versions of records in excess of the maximum specified by the System Default Maximum Versions Universal Controller system property.
Refresh System Default List Layouts	For Controller upgrades only; resets system defaults list layouts. You may be asked to run this server operation by Technical Support.
Reset All Agent Cluster Task Counts	Resets the current number of tasks currently being run by all Agent clusters to 0 (see Resetting the Current Task Count).
Reset All Agent Task Counts	Resets the current number of tasks currently being run by all Agents to 0 (see Resetting the Current Task Count).
Restart Cluster Node	Stops and restarts the Controller within the running Tomcat server. The Controller is effectively shut down and started up without stopping and starting Tomcat. Note: Restart Cluster Node will cause a failover to occur if it is executed on the Active node while another node is running as Passive.
Restore System Default List Layouts	Restores all lists to their default layouts.
Resume Cluster Node	Resumes the Controller after it has been paused using the Pause Cluster Node operation, or paused by the Start Server Paused Universal Controller property on startup.
Roll Log	Renames the existing log to a timestamped log and opens a new log file.
Run Garbage Collection	Runs the "garbage collector." The gc method suggests that the Java Virtual Machine expend effort toward recycling unused objects in order to make the memory they currently occupy available for quick re-use. When control returns from the method call, the Java Virtual Machine has made a best effort to reclaim space from all discarded objects.
Server Information	Displays the following categories of information about the Universal Controller server: • Node • License • Server Deployment • Database Information • Memory Information
System Properties	Displays all properties of the operating system on which the Controller is running. You may be asked to run this server operation by Technical Support.
Temporary Property Change	Allows for the temporary setting of specific Universal Controller properties to be used for diagnosing problems. This operation and setting of properties should be performed only under the guidance of Stonebranch support.
Thread List	Captures information about internal Controller system processes. You may be asked to run this server operation by Technical Support.
Thread List by CPU	Captures information about internal Controller system processes. You may be asked to run this server operation by Technical Support.
Thread Stack Trace	Captures information about internal Controller system processes. You may be asked to run this server operation by Technical Support.

Universal Controller Database Tables

The following table identifies and describes all Universal Controller database tables, which are listed if you run the Database Table Counts server operation, above.

*The tables are in alphabetical order according to **Table Name**.*

See Reportable Tables for a list of these database tables that are available for creating Reports.

Table	Table Name	Description
Abort Actions	ops_abort_action	Contains details about Abort actions.
Abort Actions Versions	ops_abort_action_v	Contains details about previous versions of Abort actions. New versions of Abort Action records are created when a task record is updated.
All Agents	ops_agent	Displays a list of Agents.
All Agent Clusters	ops_agent_cluster	Contains details about Agent Clusters.
All Agent Clusters Versions	ops_agent_cluster_v	Contains details about previous versions of Agent Clusters.
All Agents Mapping	ops_agent_mapping	Shows all the agents connected to one or more Promotion Targets (as retrieved using the Refresh Target Agents button).
Linux/Unix Agents Mapping	ops_agent_mapping_unix	Shows the mapping specifications between local Linux/Unix agents and Linux/Unix agents on a Promotion Target (as retrieved using the Refresh Target Agents button).
Windows Agents Mapping	ops_agent_mapping_windows	Shows the mapping specifications between local Windows agents and Windows agents on a Promotion Target (as retrieved using the Refresh Target Agents button).
z/OS Agents Mapping	ops_agent_mapping_zos	Shows the mapping specifications between local z/OS agents and z/OS agents on a Promotion Target (as retrieved using the Refresh Target Agents button).
Applications	ops_application	Shows a list of Application Resources.
Applications Versions	ops_application_v	Contains details about previous versions of Application resources.
Audits	ops_audit	Contains details of events being written to the Audit history.
Backups	ops_backup	Contains Backup and Purge records.
Bundles	ops_bundle	Contains all Bundles records.
Bundles and Agent Clusters	ops_bundle_agent_cluster_join	Shows relationship information between Bundles and Agent Clusters; that is, which agent clusters belong to which bundles.
Bundles and Applications	ops_bundle_application_join	Shows relationship information between Bundles and Application resources; that is, which Application resources belong to which bundles.
Bundles and Calendars	ops_bundle_calendar_join	Contains relationship information between Bundles and Calendars; that is, which Calendars belong to which Bundles.
Bundles and Credentials	ops_bundle_credentials_join	Contains relationship information between Bundles and Credentials; that is, which Credential records belong to which bundles.
Bundles and Custom Days	ops_bundle_custom_day_join	Contains relationship information between Custom Days and Bundles; that is, which Custom Days belong to which Bundles.

Bundles and Database Connections	ops_bundle_db_cntn_join	Contains information about the relationship between Bundles and Database Connections; that is, which Database Connections belong to which Bundles.
Bundles and Email Connections	ops_bundle_email_cntn_join	Contains information about the relationship between Bundles and Email Connections; that is, which Email Connections belong to which Bundles.
Bundles and Email Templates	ops_bundle_email_tmplt_join	Contains relationship information between Bundles and Email templates; that is, which Email Templates belong to which Bundles.
Bundles and Business Services	ops_bundle_generic_group_join	Contains relationship information between Bundles and Business Services; that is, which Business Services belong to which Bundles.
Bundles and PeopleSoft Connections	ops_bundle_ps_cntn_join	Contains relationship information between Bundles and PeopleSoft Connection; that is, which PeopleSoft Connection records are in which Bundles.
Bundles and Virtual Resources	ops_bundle_resource_join	Contains relationship information between Bundles and Virtual Resources; that is, which Virtual Resources belong to which Bundles.
Bundles and SAP Connections	ops_bundle_sap_cntn_join	Contains relationship information between Bundles and SAP Connection; that is, which SAP Connection records are in which Bundles.
Bundles and Scripts	ops_bundle_script_join	Contains relationship information between Bundles and Script; that is, which Scripts belong to which Bundles.
Bundles and SNMP Managers	ops_bundle_snmp_cntn_join	Contains relationship information between Bundles and SNMP Manager; that is, which SNMP Managers belong to which Bundles.
Promotion Targets	ops_bundle_target	Contains details about Promotion Target records.
Bundles and Tasks	ops_bundle_task_join	Contains relationship information between Bundles and Tasks; that is, which Tasks are in which Bundles.
Bundles and Triggers	ops_bundle_trigger_join	Contains relationship information between Bundles and Triggers; that is, which Triggers are in which Bundles.
Bundles and Variables	ops_bundle_variable_join	Contains relationship information between Bundles and Global variables; that is, which Global variables belong to which Bundles.
Calendar Custom Days	ops_cal_cust_join	Contains details about which Custom Days are associated with which Calendar records.
Calendar Custom Days Versions	ops_cal_cust_join_v	Contains previous versions of the association between Custom Days and Calendar records.
Calendars	ops_calendar	Contains details about Calendar records.
Calendars Versions	ops_calendar_v	Contains previous versions of Calendar records.
Chart Colors	ops_chart_color	Contains details about colors used in Chart reports.
Cluster Lock	ops_cluster_lock	(For internal use only.)
Cluster Nodes	ops_cluster_node	Provides details about cluster nodes.
Cluster Nodes Notifications	ops_cluster_notification	Contains Email and SNMP notification records associated with the cluster node.
Command	ops_command	(For internal use only.)
Command Response	ops_command_response	(For internal use only.)

Properties	ops_config	Contains Universal Controller System Properties.
Connector Notifications	ops_connector_notification	Contains Email Notification and SNMP Notification data associated with Agents and OMS Servers.
Counter	ops_count	(For internal use only.)
Credentials	ops_credentials	Login credentials used by the Controller to access remote machines.
Credentials Versions	ops_credentials_v	Contains previous versions of Credentials records.
Custom Days	ops_custom_day	Contains details about defined Custom Days.
Custom Days Versions	ops_custom_day_v	Contains previous versions of Custom Days records.
Dashboards	ops_dashboard	Contains details about Dashboards.
Dashboards Portlets	ops_dashboard_portlet	Contains details about the content (Widgets) on the Dashboards.
Database Connections	ops_database_connection	Contains details about [Database Connections defined in the Controller database.
Database Connections Versions	ops_database_connection_v	Contains previous versions of [Database Connections records.
Email Notifications	ops_email_cluster_notification	Contains Email Notification records associated with Cluster Nodes.
Email Notifications	ops_email_conn_notification	Contains Email Notification-specific data associated with Agents and OMS Servers.
Email Connections	ops_email_connection	Contains details about Email Connections resources.
Email Connections Versions	ops_email_connection_v	Contains previous versions of Email Connections records.
Email Notifications	ops_email_notification	Contains details about Email Notifications associated with tasks.
Email Notifications Versions	ops_email_notification_v	Contains previous versions of Email Notifications associated with tasks. Note that a new version is created only when the task is updated.
Email Templates	ops_email_template	Contains details about Email templates.
Email Templates Versions	ops_email_template_v	Contains previous versions of Email template records.
Event Email	ops_event_email	(For internal use only.)
Event Exec Defined	ops_event_exec_defined	(For internal use only.)
Event Exec Resource Order Filled	ops_event_exec_ordfill	(For internal use only.)
Event Exec Exclusive Order Filled	ops_event_exec_ordfill_ex	(For internal use only.)
Event Exec Propagate State	ops_event_exec_prop_state	(For internal use only.)

Event Exec Skip Child	ops_event_exec_skip_child	(For internal use only.)
Event Exec Start	ops_event_exec_start	(For internal use only.)
Event Exclusive	ops_event_exclusive	(For internal use only.)
Event Resource	ops_event_resource	(For internal use only.)
Event SNMP	ops_event_snmp	(For internal use only.)
Event SQL	ops_event_sql	(For internal use only.)
Event Trigger	ops_event_trigger	(For internal use only.)
Event Trigger Component	ops_event_trigger_comp	For internal use only.)
Event UAC	ops_event_uac	(For internal use only.)
Event UAC Job Abend	ops_event_uac_jobabend	(For internal use only.)
Event UAC Job Complete	ops_event_uac_jobcomp	(For internal use only.)
Event UAC Job End	ops_event_uac_jobend	(For internal use only.)
Event UAC Job Log	ops_event_uac_joblog	(For internal use only.)
Event UAC Job Launch	ops_event_uac_joblaunch	(For internal use only.)
Event UAC Job Start	ops_event_uac_jobstart	(For internal use only.)
Event UAC Job Restart Confirmation	ops_event_uac_rstrt_conf	(For internal use only.)
Event UAC Step End	ops_event_uac_stepend	(For internal use only.)
Exclusive Requests	ops_exclusive_order	Contains any outstanding requests by a task instance to run mutually exclusively.
All Task Instances	ops_exec	Task instance activity (running tasks).
Application Control Task Instances	ops_exec_application_control	Contains details about Application Control task instances.
Email Task Instances	ops_exec_email	Contains details about Email task instances.
Email Monitor Task Instances	ops_exec_email_monitor	Contains details about Email Monitor task instances.
Advanced Criteria	ops_exec_email_criteria	Contains details about Email Monitor task instances Advanced Criteria.

Agent File Monitor Instances	ops_exec_file_monitor	Contains details about Agent File Monitor task instances.
File Transfer Task Instances	ops_exec_ftp	Contains details about File Transfer task instances.
Remote File Monitor Instances	ops_exec_ftp_file_monitor	Contains details about Remote File Monitor task instances.
Universal Command Task Instances	ops_exec_indesca	Contains details about Universal Command task instances.
License Instance History	ops_exec_license_history	Contains statistics relating to the number of task instance executions.
Manual Task Instances	ops_exec_manual	Contains details about Manual task instances.
Task Monitor Instances	ops_exec_monitor	Contains details about Task Monitor task instances.
Output	ops_exec_output	Contains any output (such as STDOUT) attached to task instances.
PeopleSoft Task Instances	ops_exec_peoplesoft	Contains PeopleSoft task instance records.
PeopleSoft Task Parameters	ops_exec_peoplesoft_rt_param	Contains Parameter records associated with PeopleSoft task instances.
Recurring Task Instances	ops_exec_recurring	Contains details about Recurring task instances.
Task Instances Run Criteria	ops_exec_run_criteria	Contains run criteria information for task instances within a Workflow.
SAP Task Instances	ops_exec_sap	Contains SAP task instance records.
Timer Task Instances	ops_exec_sleep	Contains details about Timer task instances.
SQL Task Instances	ops_exec_sql	Contains details about SQL task instances.
Stored Procedure Task Instances	ops_exec_stored_proc	Contains details about Stored Procedure task instances.
Stored Procedure Task Parameters	ops_exec_stored_proc_param	Contains Parameter records associated with Stored Procedure task instances.
System Monitor Task Instances	ops_exec_system_monitor	Contains System Monitor task task instance records.
Task Instance Virtual Resources	ops_exec_to_resource	Contains relationship information between Virtual Resources and task instances; that is, which task instances are assigned to which Virtual Resources.
Universal Task Instances	ops_exec_universal	Contains details about Universal Task instances.
Linux/Unix Task Instances	ops_exec_unix	Contains details about Linux/Unix task instances.
Variable Monitor Task Instances	ops_exec_variable_monitor	Contains Variable Monitor task task instance records.
Windows Task Instances	ops_exec_windows	Contains details about Windows task instances.

Workflow Task Instances	ops_exec_workflow	Contains details about Workflow task instances.
Workflow Task Instance Dependencies	ops_exec_workflow_edge	Contains information about the conditions specified between task instances within workflows.
Workflow Task Instance Vertices	ops_exec_workflow_vertex	Contains relationship information between workflow instances and task instances; that is, which tasks are running in which workflows.
z/OS Task Instances	ops_exec_zos	Contains details about z/OS task instances.
Restart Confirmations	ops_exec_zos_confirm	Contains details about any restart confirmations performed on z/OS tasks.
Job Step Files Data	ops_exec_zos_files	Contains details about jobsteps in a z/OS task.
Restartable Job Steps	ops_exec_zos_jobsteps	Contains historical details about restartable job steps in a z/OS task.
Restartable Job Steps	ops_exec_zos_jobstepsui	Contains details about restartable job steps in a z/OS task.
Restart Criteria	ops_exec_zos_rstrt_criteria	Contain information about z/OS task restart criteria.
Step Conditions	ops_exec_zos_stepcond	Contains details about z/OS task instance step conditions.
Externalizable	ops_externalizable	Contains an internal table for events.
Business Services	ops_generic_group	Contains details about Business Services.
Business Services Versions	ops_generic_group_v	Contains previous versions of Business Service records.
Group Roles	ops_group_has_role	Contains relationship information between Universal Controller User Groups and Roles; that is, which Groups have been assigned which Roles.
History	ops_history	Contains a history of task activity.
LDAP	ops_ldap	Identifies where LDAP Settings are stored.
Licenses	ops_license	Contains information about the Controller license.
List Grid Filters	ops_list_grid_filter	Identifies where persistent filters are stored.
List Grid Pin Filters	ops_list_grid_pin_filter	Identifies where pinned filters are stored.
List Grid Preferences	ops_list_grid_pref	Contains information about list layouts.
Local Custom Days	ops_local_custom_days	Contains details about Local Custom Days.
Local Custom Days Versions	ops_local_custom_days_v	Contains previous versions of Local Custom Days.
Local Variables	ops_local_variable	Contains details about task and trigger variables (also called local variables), entered into the Variables tab on a task or trigger record.
Local Variables Versions	ops_local_variable_v	Contains previous versions of Local variables associated with tasks or triggers. (New version records are created only when a task or trigger is updated.
Maps	ops_map	(For internal use only.)

Navigator	ops_nav_tree_pref	Contains Navigation Tree Configuration data.
Notes	ops_note	Contains details about Notes attached to Controller records.
Notes Versions	ops_note_v	Contains previous versions of Notes records.
All Actions	ops_notification	Contains details about all task actions: Abort Action, Email Notifications, Set Variable, SNMP Notification, and System Operation.
All Actions Versions	ops_notification_v	Contains details about previous versions of all task actions: Abort Action, Email Notifications, Set Variable, SNMP Notification, and System Operation. New versions of Action records are created when a task record is updated.
OMS Servers	ops_oms_server	Provides details about OMS Servers.
Output Messages	ops_output_msg	(For internal use only.)
PeopleSoft Connections	ops_peoplesoft_connection	Contains PeopleSoft Connection records.
PeopleSoft Connections Versions	ops_peoplesoft_connection_v	Contains previous versions of PeopleSoft Connection records.
Permissions	ops_permission	Contains details about Universal Controller Permissions assigned to Universal Controller Users and Universal Controller User Groups.
Promotion History	ops_promotion_history	Contains a list of Bundles that have been promoted into the current database.
Promotion History Items	ops_promotion_history_item	Contains a list of records that have been promoted into the current database. If a record has been promoted more than once, each version is listed separately.
Promotion Schedule	ops_promotion_schedule	Contains a list of Promotion Schedules.
Reports	ops_report	Contains information about Controller Reports.
Outstanding Requests	ops_resource_order	Contains any outstanding requests for a Virtual Resource by a task instance.
Currently In Use By	ops_resource_usage	Contains details about Virtual resource usage, as displayed in the Currently In Use By tab.
SAP Connections	ops_sap_connection	Contains SAP Connection records.
SAP Connections Versions	ops_sap_connection_v	Contains previous versions of SAP Connection records.
Schemas	ops_schema	Contains version information about database schemas.
Scripts	ops_script	Contains Script records.
Scripts Versions	ops_script_v	Contains previous versions of Script records.
SNMP Notifications	ops_snmp_cluster_notification	Contains SNMP notifications defined for Cluster Nodes.
SNMP Notifications	ops_snmp_conn_notification	Contains SNMP Notification-specific data associated with Agents and OMS Servers.
SNMP Managers	ops_snmp_connection	Contains SNMP Manager records.
SNMP Managers Versions	ops_snmp_connection_v	Contains previous versions of SNMP Manager records.

SNMP Notifications	ops_snmp_notification	Contains SNMP notifications defined for Tasks.
SNMP Notifications Versions	ops_snmp_notification_v	Contains previous versions of SNMP notifications defined for Tasks. (Versions are created only when a task is updated.
SQL Results Set	ops_sql_results	Contains output from SQL tasks.
SQL Warnings Set	ops_sql_warnings	Contains warnings returned by executed SQL statements.
Stored Procedure Parameters	ops_stored_proc_param	Contains Parameter records associated with Stored Procedure tasks.
Stored Procedure Parameters Versions	ops_stored_proc_param_v	Contains previous versions of Parameter records associated with Stored Procedure tasks. (Versions are created only when the task is updated.
Subscription	ops_subscription	(For internal use only.)
System Operations	ops_system_operation	Contains details about System Operation actions.
System Operations Versions	ops_system_operation_v	Contains details about previous versions of System Operation actions. (Versions of records are created only when a record is updated.)
All Tasks	ops_task	Contains details about tasks of every type, along with associated Task Instance information.
Application Control Tasks	ops_task_application_control	Contains details about Application Control tasks.
Application Control Task Versions	ops_task_application_control_v	Shows previous versions of Application Control tasks.
Email Tasks	ops_task_email	Contains details about Email tasks.
Email Task Versions	ops_task_email_v	Contains previous versions of Email task records.
Email Monitor Tasks	ops_task_email_monitor	Contains details about Email Monitor tasks.
Email Monitor Task Versions	ops_task_email_monitor_v	Contains previous versions of Email Monitor task records.
Advanced Criteria	ops_task_email_criteria	Contains details about Email Monitor task Advanced Criteria.
Agent File Monitors	ops_task_file_monitor	Contains details about Agent File Monitor tasks.
Agent File Monitor Task Versions	ops_task_file_monitor_v	Contains previous versions of Agent File Monitor task records.
File Transfer Tasks	ops_task_ftp	Contains details about File Transfer tasks.
File Transfer Task Versions	ops_task_ftp_v	Contains previous versions of File transfer task records.
Remote File Monitors	ops_task_ftp_file_monitor	Contains details about Remote File Monitor tasks.
Remote File Monitor Versions	ops_task_ftp_file_monitor_v	Contains previous versions of Remote File Monitor task records.

Universal Command Tasks	ops_task_indesca	Contains details about Universal Command tasks.
Universal Command Task Versions	ops_task_indesca_v	Contains previous versions of Universal Command task records.
Manual Tasks	ops_task_manual	Contains details about Manual tasks.
Manual Task Versions	ops_task_manual_v	Contains previous versions of Manual task records.
Task Monitors	ops_task_monitor	Contains details about Task Monitor tasks.
Task Monitor Versions	ops_task_monitor_v	Contains previous versions of Task Monitor task records.
PeopleSoft Tasks	ops_task_peoplesoft	Contains PeopleSoft task records.
PeopleSoft Parameters	ops_task_peoplesoft_rt_param	Contains Parameter records associated with PeopleSoft tasks.
PeopleSoft Parameters Versions	ops_task_peoplesoft_rt_param_v	Contains previous versions of Parameter records associated with PeopleSoft tasks. (Versions are created only when the task is updated.
PeopleSoft Task Versions	ops_task_peoplesoft_v	Contains previous versions of PeopleSoft task records.
Recurring Tasks	ops_task_recurring	Contains Recurring task records.
Recurring Task Versions	ops_task_recurring_v	Contains previous versions of Recurring task records.
Task Run Criteria	ops_task_run_criteria	Contains run criteria information for tasks within Workflows.
Task Run Criteria Versions	ops_task_run_criteria_v	Contains previous versions of run criteria information for tasks within Workflow. (Versions are created only when the Workflow task is updated.
SAP Tasks	ops_task_sap	Contains SAP task records.
SAP Tasks Versions	ops_task_sap_v	Contains previous versions of SAP task records.
Timer Tasks	ops_task_sleep	Contains details about Timer tasks.
Timer Task Versions	ops_task_sleep_v	Contains previous versions of Timer tasks records.
SQL Tasks	ops_task_sql	Contains details about SQL tasks.
SQL Task Versions	ops_task_sql_v	Contains previous versions of SQL tasks records.
Mutually Exclusive	ops_task_to_exclusive	Contains relationship information between tasks and mutually exclusive tasks; that is, which tasks are mutually exclusive with each other.
Mutually Exclusive Versions	ops_task_to_exclusive_v	Contains previous versions of relationship information between tasks and mutually exclusive tasks.
Stored Procedure Tasks	ops_task_stored_proc	Contains details about Stored Procedure tasks.
Stored Procedure Tasks Versions	ops_task_stored_proc_v	Contains previous versions of Stored Procedure tasks records.
System Monitors	ops_task_system_monitor	Contains System Monitor task records.

System Monitor Versions	ops_task_system_monitor_v	Contains previous versions of System Monitor task records.
Task Virtual Resources	ops_task_to_resource	Contains relationship information between Virtual Resources and tasks; that is, which tasks are assigned to which Virtual Resources.
Task Virtual Resources Versions	ops_task_to_resource_v	Contains previous versions of relationship information between Virtual Resources and tasks.
Universal Tasks	ops_task_universal	Contains details about Universal tasks.
Universal Task Versions	ops_task_universal_v	Contains previous versions of Universal task records.
Linux/Unix Tasks	ops_task_unix	Contains details about Linux/Unix tasks.
Linux/Unix Task Versions	ops_task_unix_v	Contains previous versions of Linux/Unix task records.
All Tasks Versions	ops_task_v	Contains previous versions of all task records.
Variable Monitor Tasks	ops_task_variable_monitor	Contains details about Variable Monitor tasks.
Variable Monitor Task Versions	ops_task_variable_monitor_v	Contains previous versions of Variable Monitor task records.
Windows Tasks	ops_task_windows	Contains details about Windows tasks.
Windows Task Versions	ops_task_windows_v	Contains previous versions of Windows task records.
Workflow Tasks	ops_task_workflow	Contains details about Workflow tasks.
Task Workflow Dependencies	ops_task_workflow_edge	Contains information about the conditions specified between tasks in workflows.
Workflow Task Edges	ops_task_workflow_edge_v	Contains previous versions of information about the conditions specified among tasks in workflows. (New versions of records are created only when the Workflow task is updated.
Workflow Task Versions	ops_task_workflow_v	Contains previous versions of workflow task records.
Workflow Tasks Vertices	ops_task_workflow_vertex	Contains relationship information between tasks and workflows; that is, which tasks are in which workflows.
Workflow Tasks Vertices Versions	ops_task_workflow_vertex_v	Contains previous versions of the relationship between tasks and workflows. (Versions are created only when the workflow task is updated.
z/OS Tasks	ops_task_zos	Contains details about z/OS tasks.
Restart Criteria	ops_task_zos_rstrt_criteria	Contain information about z/OS task restart criteria.
Restart Criteria	ops_task_zos_rstrt_criteria_v	Contains previous versions of z/OS task restart criteria.
Step Conditions	ops_task_zos_stepcond	Contains details about z/OS task step conditions
Step Conditions	ops_task_zos_stepcond_v	Contains previous versions of z/OS task step conditions
z/OS Task Versions	ops_task_zos_v	Contains previous versions of z/OS task records.

Time Zones	ops_time_zone	Stores information on time zones.
Timer	ops_timer	(For internal use only.)
All Triggers	ops_trigger	Contains details about triggers of every type.
Application Monitor Triggers	ops_trigger_appl_monitor	Contains details about Application Monitor triggers.
Application Monitor Triggers Versions	ops_trigger_appl_monitor_v	Contains details about previous versions of Application Monitor triggers.
All Components	ops_trigger_component	Contains details about all Composite trigger components.
Email Monitor Components	ops_trigger_component_em	Contains details about Email Monitor components of Composite Triggers.
Email Monitor Components	ops_trigger_component_em_v	Contains details about previous versions of Email Monitor components of Composite Triggers.
File Monitor Components	ops_trigger_component_fm	Contains details about File Monitor components of Composite Triggers.
File Monitor Components	ops_trigger_component_fm_v	Contains details about previous versions of File Monitor components of Composite Triggers.
Time Components	ops_trigger_component_time	Contains details about Time components of Composite Triggers.
Time Components	ops_trigger_component_time_v	Contains details about previous versions of Time components of Composite Triggers.
Variable Monitor Components	ops_trigger_component_vm	Contains details about Variable Monitor components of Composite Triggers.
Variable Monitor Components	ops_trigger_component_vm_v	Contains details about previous versions of Variable Monitor components of Composite Triggers.
Task Monitor Components	ops_trigger_component_tm	Contains details about Task Monitor components of Composite Triggers.
Task Monitor Components	ops_trigger_component_tm_v	Contains details about previous versions of Task Monitor components of Composite Triggers.
All Components	ops_trigger_component_v	Contains details about previous versions of all Composite trigger components.
Composite Triggers	ops_trigger_composite	Contains details about Composite trigger records.
Composite Triggers	ops_trigger_composite_v	Contains details about previous versions of Composite trigger records.
Cron Triggers	ops_trigger_cron	Contains details about Cron trigger records.
Cron Trigger Versions	ops_trigger_cron_v	Contains previous versions of Cron trigger records.
Email Monitor Triggers	ops_trigger_em	Contains details about Email Monitor trigger records.

Email Monitor Trigger Versions	ops_trigger_em_v	Contains previous versions of Email Monitor trigger records.
File Monitor Triggers	ops_trigger_fm	Contains details about File Monitor triggers.
File Monitor Triggers Versions	ops_trigger_fm_v	Contains previous versions of File Monitor trigger records.
Forecasts	ops_trigger_forecast	Contains details about trigger forecasts.
Manual Triggers	ops_trigger_manual	Contains Manual trigger records.
Manual Trigger Versions	ops_trigger_manual_v	Contains previous versions of Manual trigger records.
Temporary Triggers	ops_trigger_temp	Contains details about Temporary triggers.
Temporary Triggers Versions	ops_trigger_temp_v	Contains previous versions of Temporary trigger records.
Time Triggers	ops_trigger_time	Contains details about Time triggers.
Time Triggers Versions	ops_trigger_time_v	Contains previous versions of Time trigger records.
Task Monitor Triggers	ops_trigger_tm	Contains details about Task Monitor triggers.
Task Monitor Triggers Versions	ops_trigger_tm_v	Contains previous versions of Task Monitor trigger records.
All Triggers Versions	ops_trigger_v	Contains previous versions of Trigger records.
Variable Monitor Triggers	ops_trigger_vm	Contains details about Variable Monitor triggers.
Variable Monitor Triggers Versions	ops_trigger_vm_v	Contains previous versions of Variable Monitor trigger records.
Linux/Unix Agents	ops_unix_agent	Contains details about Linux/Unix agent resources.
Linux/Unix Agent Clusters	ops_unix_agent_cluster	Contains details about Linux/Unix agent clusters.
Linux/Unix Agents In Cluster	ops_unix_agent_cluster_join	Shows relationship information between Unix agents and Unix agent clusters, that is, which agents belong to which clusters.
Linux/Unix Agents In Cluster Versions	ops_unix_agent_cluster_join_v	Shows previous versions of relationship information between Unix agents and Unix agent clusters.
Linux/Unix Agent Clusters Versions	ops_unix_agent_cluster_v	Contains previous versions of Linux/Unix cluster records.
Universal Templates	ops_unv_tmplt	Contains details about Universal Templates.
Universal Template Fields	ops_unv_tmplt_field	Contains details about Universal Template Fields.
Universal Template Field Choice Values	ops_unv_tmplt_field_choice	Contains details about Universal Templates. (Requires ops_admin or ops_universal_template_admin role.)
Users	ops_user	Contains details about User records.
Group Members	ops_user_grmember	Contains relationship information between Universal Controller User Groups and Universal Controller Users; that is, which Users belong to which Groups.

Groups	ops_user_group	Contains details about Universal Controller User Groups.
User Roles	ops_user_has_role	Contains details about Users and Roles, including which Users have which Roles.
User Preferences	ops_user_preference	Contains information about Universal Controller User Preferences.
User Roles	ops_user_role	Contains information about available user roles.
User Roles Contains	ops_user_role_contains	Contains information about roles that comprise parent roles user roles.
User Tokens	ops_user_token	Contains information about user sessions.
Variables	ops_variable	Contains details about Global variables, entered by selecting Variables from the Navigation pane.
Set Variables	ops_variable_action	Contains details about Set Variable actions.
Set Variables	ops_variable_action_v	Contains previous versions of Set Variable actions.
Variables Versions	ops_variable_v	Contains previous versions of Global variables.
Virtual Resources	ops_virtual_resource	Contains details about Virtual resource records.
Virtual Resources Versions	ops_virtual_resource_v	Contains previous versions of Virtual resources.
Widgets	ops_widget	Contains details about all Widgets.
Widgets Activity	ops_widget_activity	Contains details about Activity Widgets.
Widgets Report	ops_widget_report	Contains details about Report Widgets.
Widgets System	ops_widget_system	Contains details about System Widgets.
Windows Agents In Cluster	ops_win_agent_cluster_join	Shows relationship information between Windows agents and Windows agent clusters, that is, which agents belong to which clusters.
Windows Agents In Cluster Versions	ops_win_agent_cluster_join_v	Shows previous versions of relationship information between Windows agents and Windows agent clusters.
Windows Agents	ops_windows_agent	Contains details about Windows agents.
Windows Agent Clusters	ops_windows_agent_cluster	Contains details about Windows agent clusters.
Windows Agent Clusters Versions	ops_windows_agent_cluster_v	Contains previous versions of Windows Agent Cluster records.
z/OS Agents	ops_zos_agent	Contains details about z/OS agents.
All Step Actions	ops_zos_step_action	Contains details about z/OS step actions.
System Operations	ops_zos_step_action_sysop	Contains details about z/OS System Operation step actions.
System Operations Versions	ops_zos_step_action_sysop_v	Contains details about previous versions of z/OS System Operation step actions. (Versions are created only when a record is updated.)

Step Actions	ops_zos_step_action_v	Contains previous versions of z/OS step actions. (Versions are created only when a record is updated.)

Password Settings

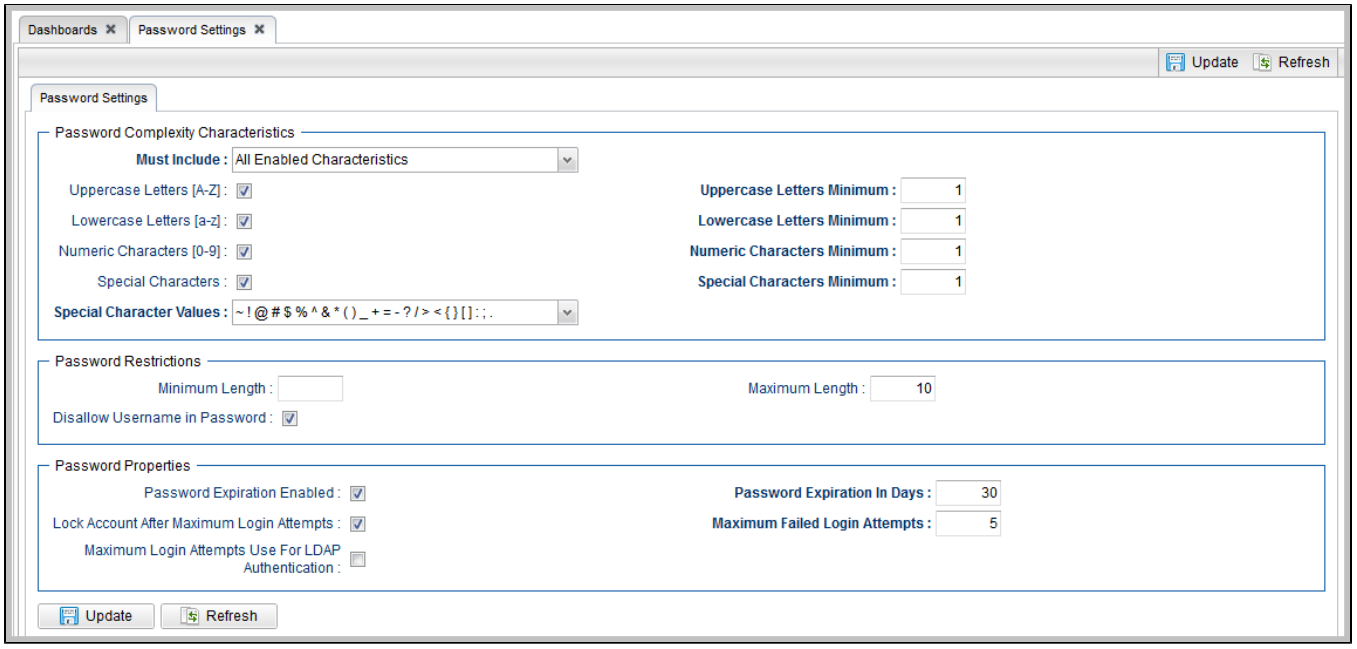
- Overview
- Password Settings Details
- Password Settings Field Descriptions

Overview

Password Settings lets you configure settings for all user passwords.

Password Settings Details

The following Password Settings Details is for the default Password Settings. See the field descriptions below, for a description of all fields that display in the Password Settings Details.



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

Password Settings Field Descriptions

The following table describes the fields and buttons that display in the Password Settings.

Field Name	Description
Password Complexity Characteristics	This section defines any requirements that passwords must conform to.
Must Include	Specification for how many of the enabled restrictions the password must include: Options: • All Enabled Characteristics • I of the Enabled Characteristics • 2 of the Enabled Characteristics • 3 of the Enabled Characteristics
Uppercase Letters (A-Z)	If enabled, the Uppercase Letters Minimum field displays.
Uppercase Letters Minimum	Minimum number of Uppercase Letters that a Password must contain.
Lowercase Letters (a-z)	If enabled, the Lowercase Letters Minimum field displays.
Lowercase Letters Minimum	Minimum number of Lowercase Letters that a Password must contain.
Numeric Characters (0-9)	If enabled, the Numeric Characters Minimum field displays.
Numeric Characters Minimum	Minimum number of Numeric Characters that a Password must contain.
Special Characters	If enabled, the Special Characters Minimum field and Special Character Values field display.
Special Characters Minimum	Minimum number of Special Characters that a Password must contain.
Special Character Values	Values that comprise the list of Special Characters that can be used in a Password. (Default is all Special Characters on the list.)
Password Restrictions	This section defines any restrictions that passwords must conform to.
Minimum Length	Minimum length of a Password. Value can be empty (null). If specified, it must be a positive integer and not greater than the **Maximum Length**.
Maximum Length	Maximum length of a Password. Value can be empty (null). If specified, it must be a positive integer and not less than the **Minimum Length**.
Disallow Username in Password	If enabled, the Username cannot appear within the Password.
Password Properties	Properties for the Passwords. Note Prior to Universal Controller 6.8.x, these properties were included in the Universal Controller System Properties.

Password Expiration Enabled	If enabled, Passwords can automatically expire.
Password Expiration in Days	Number of days before a Password expires.
Lock Account After Maximum Login Attempts	If enabled, the user account is locked if the Maximum Failed Login Attempts is exceeded.
Maximum Failed Login Attempts	Maximum number of failed login attempts that is allowed.
Maximum Login Attempts Use For LDAP Authentication	If enabled, the user account is locked if the Maximum Failed Login Attempts is exceeded for LDAP.
Buttons	This section identifies the buttons displayed above and below the Password Settings that let you perform various actions.
Update	Saves updates to this record.
Refresh	Refreshes any dynamic data displayed in this record.

Universal Templates

Universal Templates

The following pages are provided for Universal Templates:

- Universal Templates Overview
- Creating a Universal Template
- Copying Universal Templates
- Built-In Universal Templates
- Downloadable Universal Templates

Universal Templates Overview

- Introduction
- Universal Template Scripts
- Universal Template Fields
- Universal Template Variables
- Setting Up Universal Templates and Tasks
- Restrictions on Universal Template Changes
  - Restriction Conditions
  - List of Restrictions
- Built-In Universal Templates

Introduction

Universal Templates allows you to create the templates on which Universal Tasks are based.

Within each Universal Template, you:

- Enter a script that will be executed by any Universal Task based on that Universal Template.
- Create Fields that the Universal Controller:
  - Assigns matching variables for use in the Universal Template script.
  - Adds matching fields to the Details of any Universal Task that you create based on that Universal Template.

When you create a Universal Template, the Controller creates a Universal Task type, under the Universal Tasks folder in the Automation Center navigation pane, based on that Universal Template. When you create a Universal Task for that Universal Task type, its Details display - among other fields - the fields that you created in the Universal Template. When you run the Universal Task, it executes the script in the Universal Template, and the variables in the script are resolved to the user-defined values of their matching fields in the Universal Task instance.

Note

Administration of Universal Templates requires the ops_universal_template_admin or ops_admin role.

Universal Template Scripts

A Universal Template can contain any user-defined script. Any script variables to be resolved to Universal Task field values when the task executes the script must be in a specific format.

If you change the script in a Universal Template, the Universal Tasks based on that template execute that changed script when they are run. With Universal Task / Universal Template, you do not have to change the scripts in multiple tasks, just in the template.

Universal Template Fields

For each Field that you create for a Universal Template, the Controller:

- Assigns it a matching variable for use in the Universal Template script.
- Adds a matching field to the Details of all Universal Tasks based on that template.

When a Universal Task is run, it executes the script, and the system-assigned script variables are resolved to the user-defined values of their matching fields in the Universal Task instance.

You can enter seven types of Fields in a Universal Template:

- Text
- Integer
- Boolean
- Choice
- Credential
- Script
- Array

For each Field, you specify information regarding its appearance in the task Details for any Universal Task based on that template, including:

- Value
- Location
- Required or optional

Note

You must refresh the list of Universal Tasks that are based on a Universal Template in order for any changes to the Universal Template Fields to be applied to the Universal Task Details.

For detailed information about these Fields, see Creating Universal Template Fields.

Universal Template Variables

For each Field that you create for a Universal Template, the Controller assigns it a variable and adds the Field to the Details of all Universal Tasks based on that template.

These system-assigned variables are provided for use in the Universal Template script. When a Universal Task based on the template is run, it executes the script in the template, and all system-assigned variables in the script are resolved to the values of their matching fields in the Universal Task.

The system-assigned variables that are available for use in a Universal Template script must be in this format: `ops_<Variable Prefix>_<Field Name>`

`ops_`	Controller prefix used for all built-in variables and system-assigned variable.
`<Variable Prefix>`	Value of the user-defined Variable Prefix field in the Universal Template Details, followed by an underscore (_) character.
`<Field Name>`	Name (not Label) of the user-defined Universal Template field to which the Controller assigns this variable.

Note

If a Universal Template Field is required (either directly via the Required field in the Universal Template Field Details or indirectly via the Required If Field field), and its matching field in the Details of a Universal Task Instance is undefined after variable resolution, the Universal Task Instance will transition into the Start Failure status.

If a Universal Template Field is not Required, and its matching field in Details of a Universal Task Instance is undefined after variable resolution, the system-assigned variable for that Field will resolve to blank.

If a Universal Template Field with Type = Choice has a Choice with a NULL (or blank) Value at run time, a Universal Task Instance will transition into the Start Failure status.

Setting Up Universal Templates and Tasks

Step 1	Create a Universal Template, which includes selecting the type of Agent(s) on which Universal Tasks based on this Universal Template can be run, and a variable prefix used for script variables that you want resolved when a Universal Task executes the script in this Universal Template.

Step 2	Enter a script in the Universal Template that all Universal Tasks based on this Universal Template will execute when they are run.
Step 3	After you have entered/selected any other desired values in the Universal Template Details, save the Universal Template.
Step 4	For each parameter in the script that you want to replace with a variable, create a Universal Template Field of an appropriate Field type. The Controller automatically assigns a variable (format: `ops_<Variable Prefix>_<Field Name>`) to each Field, using the variable prefix that you specified in Step 1, and will place those Fields in the Details of all Universal Tasks based on this Universal Template.
Step 5	Replace the appropriate parameters in the script with the system-assigned variables.
Step 6	Update the Universal Template. Now that the Universal Template has one or more defined Fields, the Controller creates a Universal Task type for it and adds the Universal Task type to the Automation Center navigation pane. (You must refresh the Automation Center navigation pane in order to see the new Universal Task type.
Step 7	Create a Universal Task for that Universal Task type. The Universal Task Details will contain the fields that you created in the Universal Template for that Universal Task type.
Step 8	Enter/change values in the Universal Task fields that match the Universal Template fields, based on how you want their matching variables in the script to be resolved.
Step 9	Run the task, which executes the script. The variables in the script are resolved to the values of their matching fields in the Universal Task.

Restrictions on Universal Template Changes

There are restrictions on the changes that you can make on Universal Templates, because some changes (such as adding a new field with a default value), can automatically change existing Universal Task and Universal Task Instances based on that Template.

Some Universal Template changes are restricted, based on the existence of Universal Tasks and Universal Task Instances.

Universal Templates do not have versioning; therefore, reverting a Universal Template change must be done manually, and the restrictions still apply.

Some changes cannot be reverted; for example, you cannot broaden the Agent Type, and then narrow it. Universal Tasks do have versioning, but changes to a Universal Template that automatically change a Universal Task, such as adding a new field with a Default Value, do not generate a new version.

Any promoted Bundle that includes Universal Template changes cannot be restored.

Restriction Conditions

Restrictions on changing Universal Templates (see List of Restrictions, below) depend on the following conditions:

Condition	Restrictions
Both Universal Tasks and Universal Task Instances exist.	All restrictions apply.
Universal Tasks exist, but no Universal Task Instances exist.	All restrictions apply.
Universal Task Instances exist, but no Universal Tasks exist.	All restrictions apply if the Universal Task Instances are still active.
Neither Universal Tasks nor Universal Task Instances exist.	None of the restrictions apply unless otherwise noted.

List of Restrictions

Action	Restriction
For Universal Templates	The following Delete and Update actions refer to Universal Templates and the fields in Universal Template Details.
Delete a Template	• Prohibited.
Update a Template	
• Name	• Allowed.
• Variable Prefix	• Allowed; Requires a corresponding Script change.
• Agent Type	• Broadening Allowed (Windows to Any, Linux/Unix to Any) • Narrowing Not Allowed (Any to Windows, Any to Linux/Unix, Windows to Linux/Unix, Linux/Unix to Windows)
• Use Common Script • Script • Linux/Unix Script • Windows Script • Windows Script Type	• Allowed.
For Universal Template Fields	The following Add, Delete, and Update actions refer to the user-defined Fields that are added to a Universal Template.
Add a Field	• Allowed (with conditions); Requires a corresponding Script change. • Prohibited if either Required or Required If Field/Required If Field Value(s) are specified. • Default Value applied to all Universal Tasks, but not to Universal Task Instances.

Delete a Field	• Allowed (with conditions); Requires a corresponding Script change.
	• Prohibited if the Field is the only Field in the Universal Template Details; User can either:
	  ◦ Update the only Field.
	  ◦ Create a new Field prior to deleting the only Field.
	
	Note
	This restriction applies regardless of the existence of Universal Task/Task Instances associated with the Universal Template.
	
	• NULL value is applied to deleted Text, Integer, Choice, and Credential Fields in all Universal Tasks, but not Universal Task Instances.
	• A boolean False value is applied to a deleted Boolean Field for all Universal Tasks, but not Universal Task Instances.

Update a Field	
• Name	• Prohibited.

• Required	• Allowed (with conditions). • Unchecking the Required field; Allowed (without conditions). • Checking the Required field; Allowed only if all Universal Tasks based on the Template have a value specified for this Template Field (does not apply to Universal Task Instances).
• Require If Field • Require If Field Value(s)	• Allowed (with conditions). • Removing a Require If Field specification; Allowed (without conditions). • Adding a Require If Field specification; Allowed only if all Universal Tasks based on this Template have a value specified for this Template Field (condition does not apply to Universal Task Instances).
• Type	• Prohibited.
• Mapping	• Prohibited.
• Default Value	• Allowed. • No Universal Task data will be updated; multi-update can be performed to apply any required changes to pre-existing Universal Task data.
• Length	• Allowed. • No Universal Task data will be updated, as it may not comply with updated Length constraint.
• Minimum • Maximum	• Allowed. • No Universal Task data will be updated, as it may not comply with updated Minimum/Maximum constraint.
• Boolean Value Type • Boolean Yes Value • Boolean No Value	• Allowed.

• Field Display:
  • Label
  • Hint
  • Sequence
  • Form Column Span
  • Form Start Row
  • Form End Row
  • Add To Default List View
	• Allowed.

For Universal Template Field Choices	The following Add, Delete, and Update actions refer to the Choices that are defined for a Universal Template Field type of Choice.
Add a Choice	• Allowed.

Delete a Choice	• Allowed (with conditions).
	• Prohibited if the Template Field Choice is the only Choice; user can either:
	  ◦ Update the Choice Value.
	  ◦ Create a new Choice prior to removing the Choice.
	Note
	This restriction applies regardless of the existence of Universal Task/Task Instances associated with the Universal Template.
	• Any Universal Tasks using the Choice will still display the value, and substitute the old value into the Script; however, the drop-down will no longer display that Choice as an option.

Update a Choice	
• Value	• Allowed • Any Universal Task using the previous value will be updated with the new value, but not Universal Task Instances.
• Use Value For Label	• Allowed.
• Label	• Allowed.
• Sequence	• Allowed.

Built-In Universal Templates

The Controller provides built-in Universal Templates on which you can base Universal Tasks.

The title of each built-in Universal Template is preceded by **UAC -**.

Built-in Universal Templates are not editable, but you can use **Copy** to create a renamed copy of a built-in Universal Template, and then edit that template.

To use a built-in Universal Template, you first must load it from the List/Load Built-In Universal Templates Server Operation.

See Built-In Universal Templates for detailed information.

Creating a Universal Template

- Introduction
- Creating a Universal Template
  - Universal Template Details
  - Universal Template Details Field Descriptions
- Creating Universal Template Fields
  - Field Details Field Descriptions
- Creating Universal Template Field Choices
  - Choice Details Field Descriptions
- Creating Commands
  - Command Permission
  - Command Output

Introduction

This page tells you how to create a Universal Template, Universal Template Fields, and Universal Template Field Choices.

You must create Universal Templates in order to create Universal Tasks. For each Universal Template that you create, Universal Controller creates a Universal Task type for which you can create one or more Universal Tasks.

Each Universal Field that you create for a Universal Template becomes a field in every Universal Task based on the corresponding Universal Task type.

If the Universal Template Field that you create is a Choice (drop-down list) field, you must create the choices.

For detailed information on Universal Templates and Fields, see Universal Templates Overview.

Creating a Universal Template

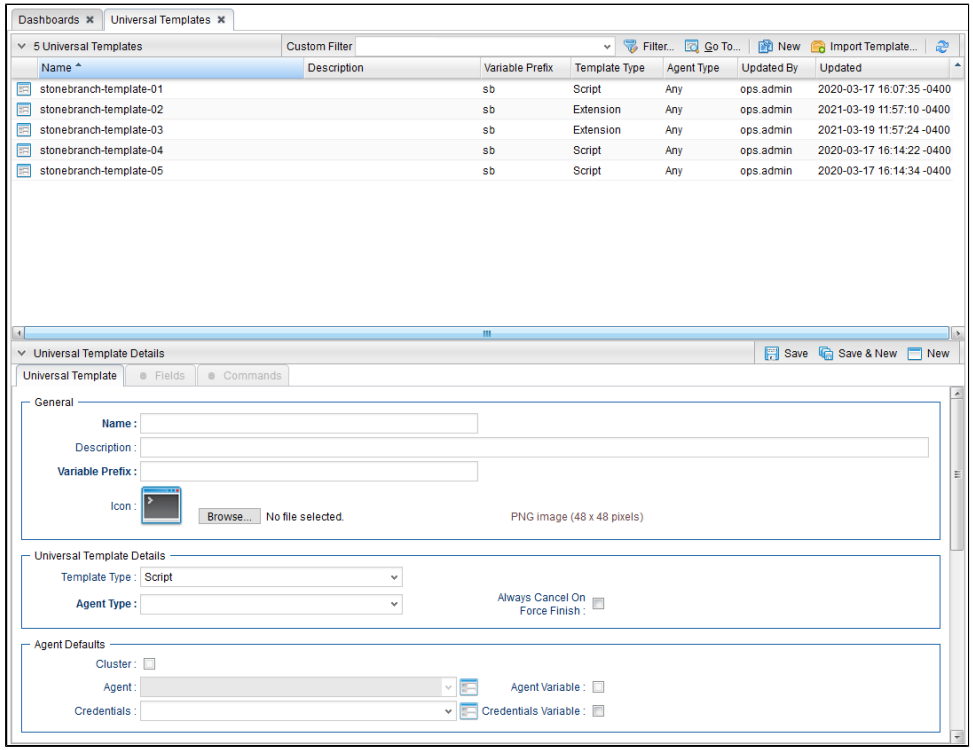
Step 1

From the Administration navigation pane, select **Configuration > Universal Templates**. The Universal Templates list displays.

Note

The System Template column. which does not display by default, identifies any Built-In Universal Templates that have been loaded from the List/Load Built-In Universal Templates server operation.

Below the list, Universal Template Details for a new Universal Template displays.



Step 2

Enter / select Details for a new Universal Template, using the field descriptions below as a guide.

- Required fields display in **boldface**.
- Default values for fields, if available, display automatically.

To display more of the Details fields on the screen, you can either:

- Use the scroll bar.
- Temporarily hide the list above the Details.
- Click the **New** button above the list to display a pop-up version of the Details.

Step 3

Click a **Save** button. The template is added to the database, and all buttons and tabs in the Universal Template Details are enabled.

Note

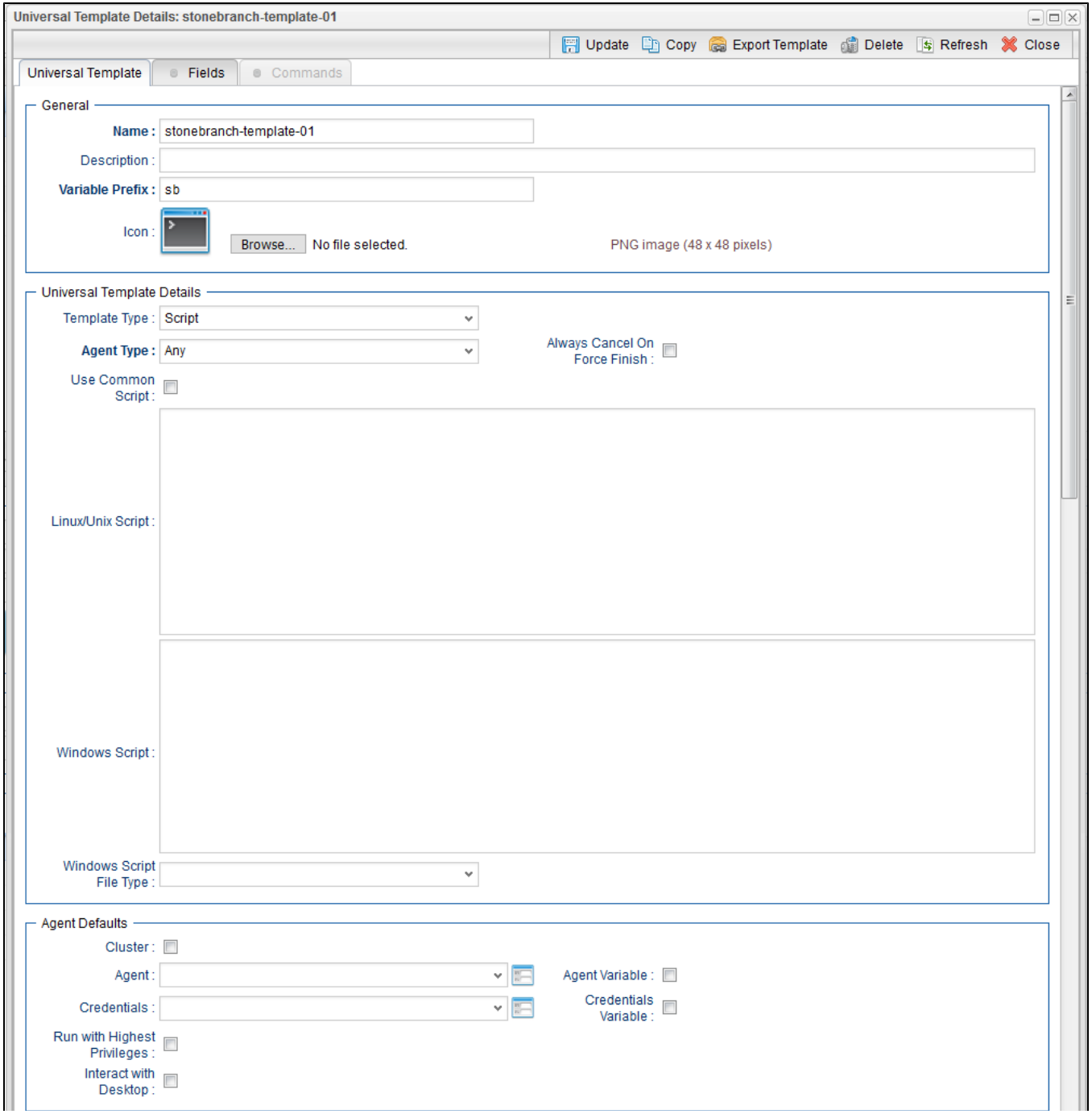
To open an existing record on the list, either:

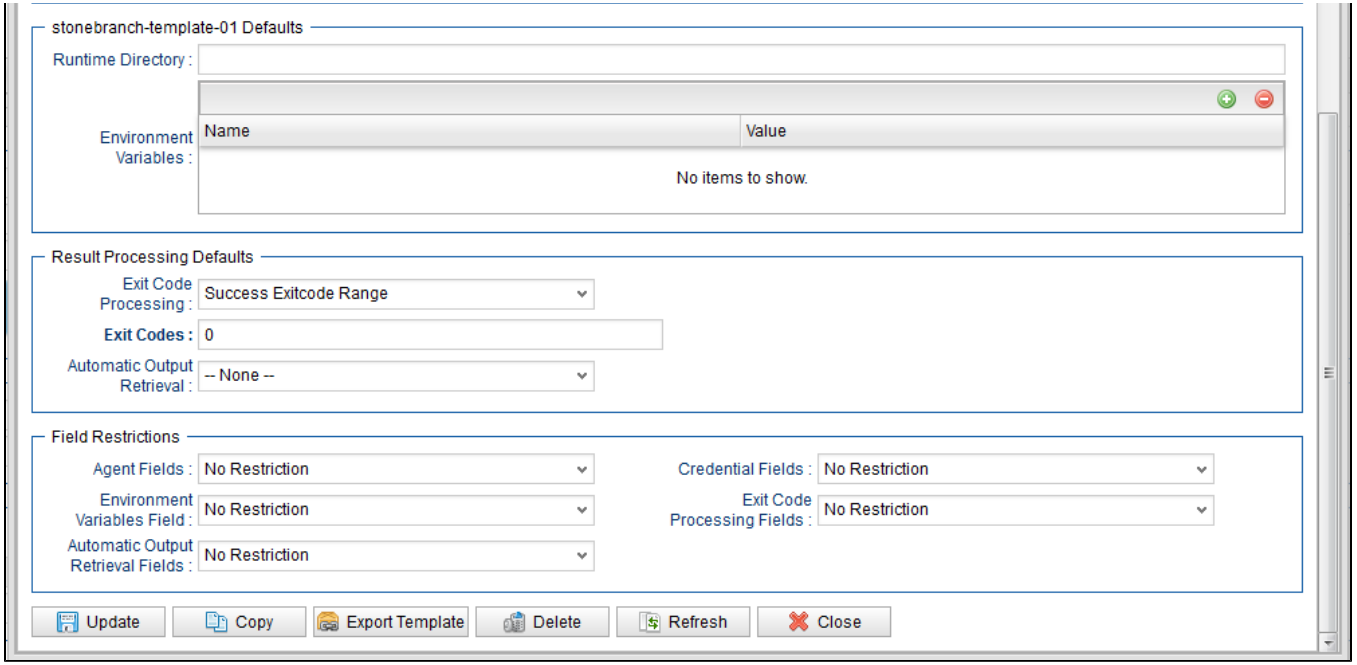
- Click a record in the list to display its record Details below the list. (To clear record Details below the list, click the **New** button that displays above and below the Details.)
- Clicking the Details icon next to a record name in the list, or right-click a record in the list and then click **Open** 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).

Universal Template Details

The following Universal Template Details is for a new Universal Template, which does not yet contain any user-defined Fields. (See Creating Universal Template Fields for an existing Universal Template Details containing user-defined fields.)

Depending on the values that you enter / select for these fields, more (or less) other fields may display. See the field descriptions, below, for a description of all fields that may display in the Universal Template Details.


Universal Template Details: stonebranch-template-01
Update
Copy
Export Template
Delete
Refresh
Close
Universal Template
Fields
Commands
General
Name : stonebranch-template-01
Description :
Variable Prefix : sb
Icon :
Browse...
No file selected.
PNG image (48 x 48 pixels)
Universal Template Details
Template Type : Script
Agent Type : Any
Always Cancel On Force Finish :
Use Common Script :
Linux/Unix Script :
Windows Script :
Windows Script File Type :
Agent Defaults
Cluster :
Agent :
Agent Variable :
Credentials :
Credentials Variable :
Run with Highest Privileges :
Interact with Desktop :



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

Universal Template Details Field Descriptions

The following table describes the fields, buttons, and tabs that display in the Universal Template Details.

Field Name	Description
General	This section contains general information about the template.
Name	Name of this Universal Template.
Extension	If Template Type is Extension; Python Extension name.
Description	Description of this Universal Template.
Variable Prefix	Variable prefix to append to the default prefix (ops_) for the system-assigned variables that are provided for the user-defined Fields in this Universal Template. The format of a system-assigned variable is: `ops_`, followed by the specified Variable Prefix, followed by the underscore character _, followed by the **Name** (not the **Label**) of the user-defined Field. For example: `ops_oebs_username`. System-assigned variables are meant to be incorporated into the Script specified for the Universal Template. All system-assigned variables embedded in a Universal Template Script will be resolved when the Universal Task created from the template executes the Script.

Icon	Icon used for all Universal Tasks based on this Universal Template. The icon displays in the following locations:Automation Center Navigation PaneAutomation Center Navigation Tree Configurationtask bartask barWorkflow EditorA default icon displays in the Icon field for every Universal Template (see Universal Template Details, above). If you want to select a custom icon, click the Browse button and then search and select that icon. Any custom icon must be a PNG image, 48 x 48 pixels. Note The button that lets you search for an icon file, and the text message alongside it, is browser-dependent. In this example, which shows a Browse... button and No file selected. text, the browser was Firefox. After you select a custom icon, the file name for that icon displays next to the Browse button. When you save / update the Universal Template, the icon displays in the Icon field, but the file name no longer displays. If you selected a custom icon but want to restore the default icon, right-click anywhere in the Universal Template Details and, in the Action menu, click Restore Default Icon.
Log Level	If Template Type is Extension; Log Level for Universal Extension logging. Specify **Inherited** to inherit the Agent Log Level setting
Universal Template Details	This section contains assorted detailed information about the template.
Template Type	Type of Universal Template. Options: • Script Universal Template will be executed as a Script. • Extension Universal Template will be executed through the Universal Extension framework.
Agent Type	Type of Agent on which Universal Tasks based on this template can be run. Options: • Any • Linux/Unix • Windows
Always Cancel On Force Finish	Specification for whether or not to always perform a Cancel when Force Finishing a Universal Task for this template.
Use Common Script	If Template Type is Script and Agent Type is Any; Indication that the specified Script can be executed by both Linux/Unix and Windows Agents.
Script	If Use Common Script is enabled; Script to be executed by the specified Agent.
Linux/Unix Script	If Template Type is Script and Agent Type is Linux/Unix or Any (and Use Common Script is not enabled); Script to be executed by the Linux/Unix Agent.
Windows Script	If Template Type is Script and Agent Type is Windows or Any (and Use Common Script is not enabled); Script to be executed by the Windows Agent.

Windows Script File Type	If Template Type is Script and Agent Type is Windows or Any; Type of Windows script to be executed by the Windows Agent. Options: • bat • cmd • js • ps1 • py • uapy • vbs • wsf • Other... (any user-specified script file type)
Defaults	This section contains assorted default fields that will display for every Universal Task based on this template.
Agent	Name of the Agent resource that identifies the machine where the operation will run.
Agent Cluster	Group of Agents, one of which the Controller will choose to run this task (compare with Cluster Broadcast). You can specify an agent cluster in addition to or in place of a specific Agent. If you specify an Agent and an agent cluster, the Controller first tries to run the task on the specific agent. If the Agent is not available, the Controller reverts to the agent cluster. See Agent Clusters for more information.
Agent Variable	Indication of whether the Agent field is a reference field for selecting a specific Agent (unchecked) or a text field for specifying the Agent as a variable (checked). Use the format: ${variable name}. The variable must be a supported type as described in Variables and Functions. Note When updating multiple Tasks, to change from using an Agent reference to using an Agent variable, you must change the **Agent Variable** field to **Yes** and specify the Agent variable in the **Agent Unresolved** field. Conversely, to change from using an Agent variable to using an Agent reference, you must change the **Agent Variable** field to **No** and specify the Agent reference in the **Agent** field.
Agent Cluster Variable	Indication of whether the Agent Cluster field is a reference field for selecting a specific Agent Cluster (unchecked) or a text field for specifying the Agent Cluster as a variable (checked). Use the format: `${variable name}`. The variable must be a supported type as described in Variables and Functions. Note When updating multiple Tasks, to change from using an Agent Cluster reference to using an Agent Cluster variable, you must change the **Agent Cluster Variable** field to **Yes** and specify the Agent Cluster variable in the **Agent Cluster Unresolved** field. Conversely, to change from using an Agent Cluster variable to using an Agent Cluster reference, you must change the **Agent Cluster Variable** field to **No** and specify the Agent Cluster reference in the **Agent Cluster** field.
Credentials	Credentials under which an Agent runs this task. These Credentials override any Credentials provided in the Agent Details for any Agent running this task. If the user does not have a login shell, add a - character in front of the runtime credentials name. The Controller will provide a shell for that user and strip the - character from the name.

Credentials Variable	Indication of whether the Credentials field is a reference field for selecting a specific Credential (unchecked) or a text field for specifying the Credential as a variable (checked). Use the format: `${variable name}`. The variable must be a supported type as described in Variables and Functions. Note When updating multiple Tasks, to change from using a Credentials reference to using a Credentials variable, you must change the **Credentials Variable** field to **Yes** and specify the Credentials variable in the **Credentials Unresolved** field. Conversely, to change from using a Credentials variable to using a Credentials reference, you must change the **Credentials Variable** field to **No** and specify the Credentials reference in the **Credentials** field.
Cluster Broadcast	Group of Agents, all of which will run this task (compare with Agent Cluster). If Broadcast is selected for a task, you must select a Cluster Broadcast instead of a specific Agent and/or agent cluster. Each instance of the task running on its own Agent becomes a separate task instance record in the database and displays separately on the Activity Monitor.
Cluster Broadcast Variable	Indication of whether the Cluster Broadcast field is a reference field for selecting a specific Cluster Broadcast (unchecked) or a text field for specifying the Cluster Broadcast as a variable (checked). Use the format: `${variable name}`. The variable must be a supported type as described in Variables and Functions.
Run with Highest Privileges	If Agent Type is Windows or Any; Execute the task using an elevated privileges token, rather than one subject to User Account Control (UAC) restrictions. An elevated token allows a process to execute with all the privileges available to its specified credentials. For example, a task executed with an administrative account will behave as though it received permission via a UAC dialog to perform a privileged operation. This option will **not** give a user account privileges that have are not already granted to it. For example, taking ownership of a file is a privileged operation by default. A task will still fail even with this option selected if it is run with a regular user account that has not been granted the ability to change file ownership. Note This option only will affect tasks executed on Windows systems that support User Account Control (UAC). It will have no affect on tasks run on Windows releases prior to Vista (for example, Windows XP, Server 2003).
Runtime Directory	Directory from which the application should be executed. Variables supported.
Interact with Desktop	If Agent Type is Windows or Any; Specification that a Universal Task running an application with a GUI will require some manual actions from a user (for example, clicking buttons or entering values). Note This option is effective only for tasks executed on Windows XP or Server 2003. Windows Vista introduced the desktop isolation feature, which prevents tasks from accessing the interactive desktop session on Vista, Windows 7, Server 2008, Windows 8, and Server 2012. The Windows agent will execute the task, but the **Interact with Desktop** option has no effect. Therefore, an interactive application's GUI will not be visible on those platforms.
Create Console	If Interact with Desktop is enabled; Allocates a new console for the process, rather than having it inherit one.

Environment Variables	Allows you to enter environment variables needed by the program to run. To add a variable, click the **+** icon and enter a **Name** and **Value**. To delete a variable, select in the list of variables and click the **-** icon. You can add a maximum of 4,000 characters for the combined Names and Values of all variables. The variable is listed in the space underneath.
Result Processing Defaults	This section contains assorted detailed information about result processing defaults for this task.
Exit Code Processing	Specifies how the Controller should determine whether the executed command failed or completed successfully. Options: • Success Exitcode Range Command is considered completed successfully if its exit code falls within the range specified in the Exit Codes field. • Failure Exitcode Range Command is considered failed if its exit code falls within the range specified in the Exit Codes field. • Success Output Contains Command is considered completed successfully if its output contains the text specified in the Scan Output For field. • Failure Output Contains Command is considered failed if its output contains the text specified in the Scan Output For field. • Step Conditions (z/OS only) Command is considered completed successfully/failed if any of its specified condition codes falls within the range specified under the Step Conditions tab (see Creating Step Conditions).
Output Type	Required if Exit Code Processing = Success Output Contains or Failure Output Contains; type of output. Options: • Standard Output (STDOUT) • Standard Error (STDERR) • File • Extension
Content Type	If Output Type is Extension; Output type that the Result Processing mechanism should assume when evaluating the output. If the expected output is XML or JSON, it is valid to specify Text. However, when specifying XML or JSON, the output must be XML or JSON respectively; otherwise, the parsing will fail and the path expression evaluation will return no matches.
Path Expression	XPath Expression if Content Type is XML, or the JsonPath Expression if Content Type is JSON, to be used when evaluating the Extension output.
Operator	If Output Type is Extension; Condition Operator to evaluate in combination with the specified condition Value.
Value	If Output Type is Extension; Condition Value to evaluate in combination with the specified condition Operator.
Strategy	If Content Type is XML or JSON; Strategy to take when applying the condition Operator and Value against the Path Expression matches when Content Type is XML or JSON.
Auto Cleanup	Enables the auto cleanup of Extension output upon task instance completion or, if the task instance is within a workflow, when the top level workflow instance completes.

Scan Output For	Required if Exit Code Processing = Success Output Contains or Failure Output Contains; text for which the Controller should scan the output file. The Controller will process this field as a regular expression.
Output File (for Exit Code Processing)	Required if Output Type = File; path and file name of the output file that should be scanned for the text in the Scan Output For field.
Exit Codes	Required if Exit Code Processing = Success Exitcode Range or Failure Exitcode Range; range of exit codes. Format: Numeric. Use commas to list a series of exit codes; use hyphens to specify a range. Example: 1,5, 22-30. Variables are supported.
Automatic Output Retrieval	Specifies whether you want the Controller to automatically retrieve any output from the job and attach it to the task instance record. The Task Automatic Output Retrieval Default Universal Controller system property specifies the default value for this field. Options: • None Do not attach any output to the task instance record. • Standard Output Attach all standard output. • Standard Error Attach standard error output. • File Attach the file specified in the Output File field. • Standard Output/Error Attach all standard output and standard error output. Note Tasks specifying Automatic Output Retrieval will fail with Start Failure if the Agent Output Prohibited field is true in the Details of the specified Agent.
Wait For Output	If Automatic Output Retrieval = Standard Output, Standard Error, File, or Standard Output/Error, and Failure Only is not enabled (checked); Specification that the task should wait for the requested output before completing.
Failure Only	If Automatic Output Retrieval = Standard Output, Standard Error, File, or Standard Output/Error, and Wait For Output is not enabled (checked); Indication for whether output should be retrieved on task failure only.
Start Line	If Automatic Output Retrieval = Standard Output, Standard Error, File, or Standard Output/Error; Instructs the Controller to retrieve data beginning at the line indicated. • If a **Start Line** value is not specified, the default is 1. • If the **Start Line** value is **-1**, data will be retrieved starting at the end of the file.

Number of Lines	If Automatic Output Retrieval = Standard Output, Standard Error, File, or Standard Output/Error; Allows you to limit the retrieved data to the number of lines specified. If a Number of Lines value is not specified, the default is the value of the Retrieve Output Default Number Of Lines Universal Controller system property.
Scan Text	If Automatic Output Retrieval = Standard Output, Standard Error, File, or Standard Output/Error; Regex pattern that the Controller will search for a match for in STDOUT/STDERR or a specified file. The Controller will include the **Number of Lines** above and below the first line matched. if the Regex pattern is not found, the following message is returned: OPSWISE WARNING - Scan text string not found.
Output File (for Automatic Output Retrieval)	Required if Automatic Output Retrieval = File; path and file name containing the output that you want automatically retrieved and attached to the task instance.
Field Restrictions	This section lets you specify how fields in the Defaults section of the Universal Template are displayed in Universal Tasks based on the template. The Field Restrictions section places the fields in the Default section into five groups, as shown below: Agent, Credential, Environment Variables, Exit Code Processing, Automatic Output Retrieval. All fields in a field group share the same restriction. The Restriction options are the same for each field group: • No Restriction No restrictions apply to any fields in this group. {This is the default selection for all field groups.) • Read Only All fields in the field group display as Read Only in the Universal Task. • Hidden All fields in the field group are hidden in the Universal Task. Note If the Preserve Value If Hidden field is enabled for a hidden field: • The value of that field will not be reset upon an update. • Any variable related to that field will resolve to the field value.
Agent Fields	Restriction for the following Agent fields: Agent, Agent Variable, Agent Cluster, Agent Cluster Variable, and Cluster Broadcast.
Credential Fields	Restriction for the following Credential fields: Credentials, Credentials Variable, Run with Highest Privileges, Runtime Directory, Interact with Desktop, and Create Console.
Environment Variables Fields	Restriction for the following Environment Variable field: Environment Variables.
Exit Code Processing Fields	Restriction for the following Exit Code Processing fields: Exit Code Processing, Exit Codes, Output Type, Scan Output for, and Output File.
Automatic Output Retrieval Fields	Restriction for the following Automatic Output Retrieval Fields: Automatic Output Retrieval, Wait For Output, Failure Only, Start Line, Number of Lines, Scan Text, and Automatic Output File.
Metadata	This section contains Metadata information about this record.

UUID	Universally Unique Identifier of this record.
Updated By	Name of the user that last updated this record.
Updated	Date and time that this record was last updated.
Created By	Name of the user that created this record.
Created	Date and time that this record was created.
Extension Checksum	SHA-256 checksum for the Python Extension Archive.
Extension Version	Version of the Extension.
Extension API Level	API level that the Extension is compatible with.
Extension Requires Python	Python version(s) that the Python Extension Archive is guaranteed to be compatible with.
Extension Python Extra Paths	List of paths to add to the search path for Python modules.
Extension Owner	Author of the Extension.
Extension Organization	Organization of the Author.
Extension Comments	(Any comments about the Extension.)
Buttons	This section identifies the buttons displayed above and below the Universal Template Details that let you perform various actions.
Save	Saves a new Universal Template record in the Controller database.
Save & New	Saves a new Universal Template record in the Controller database and redisplays empty Details so that you can create another Universal Template.
Save & View	Saves a new Universal Template record in the Controller database and continues to display that record.
New	Displays empty (except for default values) Details for creating a new record.
Update	Updates the Universal Template record in the Controller database.
Delete	Delete the currently open Universal Template.
Refresh	Refreshes any dynamic data displayed in the Universal Template Details.
Close	For pop-up view only; closes the pop-up view of this Universal Template.
Tabs	This section identifies the tabs across the top of the Universal Template Details that provide access to additional information about the template.
Fields	Allows you to create the user-defined fields that will display in the Universal Tasks based on this template.

Commands	If Template Type is Extension; additional commands (operations) supported against a task instance (see Creating Commands,

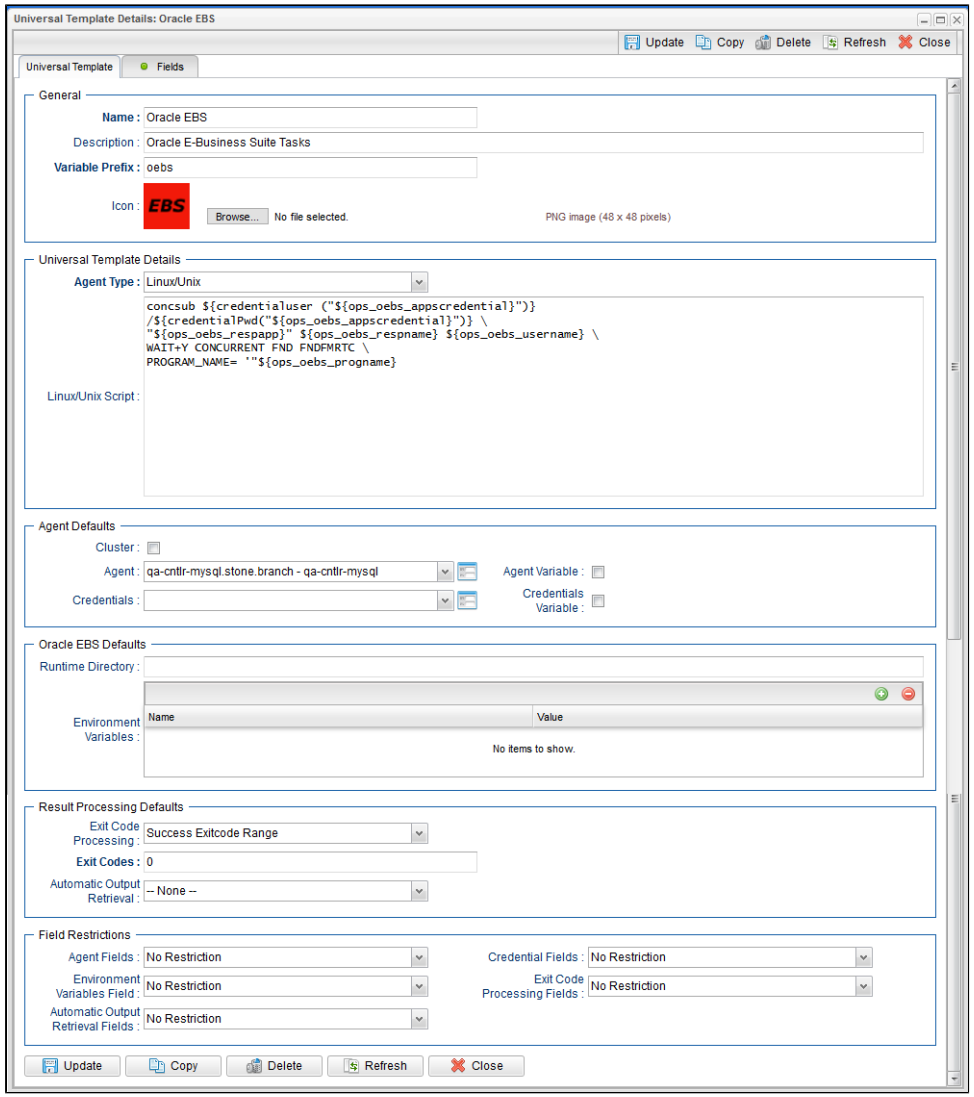
Creating Universal Template Fields

Universal Template Fields are assigned variables to be used in the Universal Template script and placed in the Details of any Universal Task based on the Universal Template.

Step 1	From the Administration navigation pane, select **Configuration > Universal Templates**. The Universal Templates list displays.

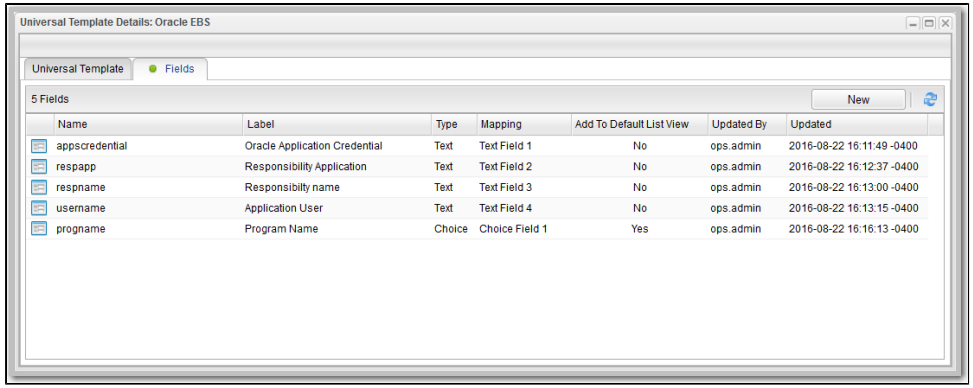
Step 2

Open an existing Universal Template for which you want to create Fields.



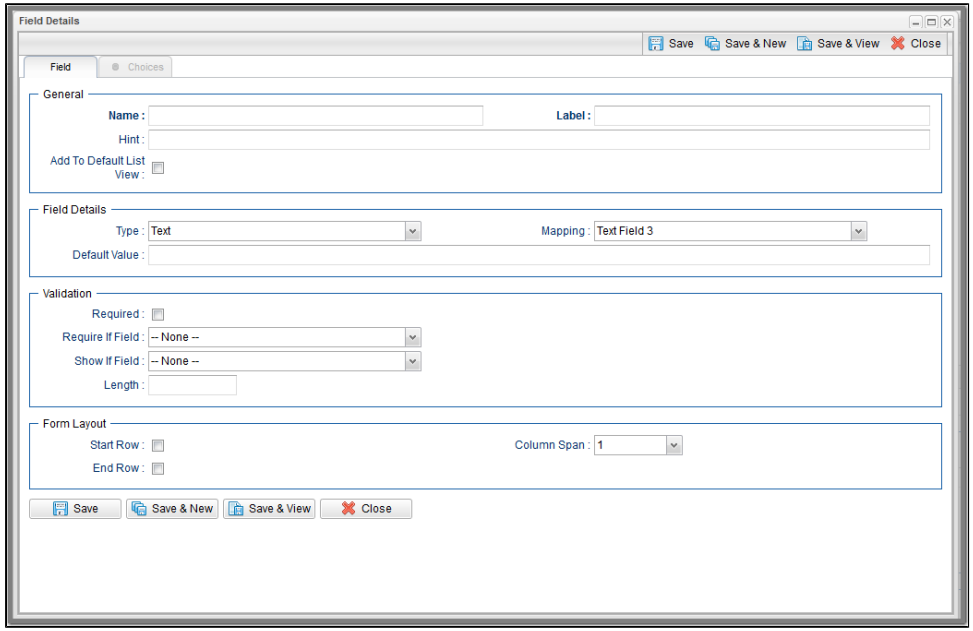
Step 3

Click the **Fields** tab to display the Fields list.



Step 4

Click the **New** button to display Field Details for a new Field.



Step 5

Enter / select Details for a new Field, using the field descriptions below as a guide.

- Required fields display in **boldface**.
- Default values for fields, if available, display automatically.

Step 6	Click a **Save** button. The Field is added to the list of Universal Template Fields. If you click the **Save** or **Save & View** button after creating a Choice Field (Type = Choice), the Choices tab (under which is an empty Choices list) is enabled, and an empty Choice Details automatica create your first Choice. If you click the **Save & New** button after creating a Choice Field, in order to create one or more other Fields, you will have to manually open that Choice Field, click the enabled Choices tab, and ther create your first Choice.

Field Details Field Descriptions

The following table describes the fields, buttons, and tabs that display in the Field Details.

Field Name	Description
General	This section contains general information about the Field.
Name	Name of this Field in the Controller database. (Name is used as the suffix for the Universal Template Variable based on this Field.) • Maximum 28 characters. • Name must begin with an alphabetic character and can consist of: alphabetics (a-z, A-Z), numerics 0-9, _ (underscore). • White spaces are not permitted. • Names are not case-sensitive.
Label	Name of this Field to be displayed in the Controller user interface.
Hint	Field hint for this Field in the Controller user interface.
Add To Default List View	If enabled; Specification that the Label of this Field will display, by default, in the list of Universal Tasks based on this template.
Field Details	This section contains detailed information about the Field.
Type	Field type for this Field. Options: • Text (default) • Integer • Boolean • Choice • Credential • Script • Array • Float

Text Type	For Extension-based Universal Templates only; Content type of Text field: • Plain • JSON • YAML
Restriction	If Type is Text, Integer, or Boolean: Options: • No Restriction • Output Only
Mapping	Field, from a pool of available fields provided for use in a Universal Template, that this Field is mapped to. Options: • If Type is Text: Text Field 1 - Text Field 20, Large Text Field 1 - Large Text Field 2. • If Type is Integer: Integer Field 1 - Integer Field 10. • If Type is Boolean: Boolean Field 1 - Boolean Field 10. • If Type is Choice: Choice Field 1 - Choice Field 15. • If Type is Credential: Credential Field 1 - Credential Field 6. • If Type is Script: Script Field 1 - Script Field 2. • If Type is Array: Array Field 1 - Array Field 4. • If Type is Float: Float Field 1 - Float Field 4. Note A field (from the pool of fields provided for use in a Universal Template) that is mapped to a Universal Template Field is not available to be mapped to any other Universal Template Field.
Default Value	If Type is Text, Integer, Choice, or Float; Default value for this Field. (Text and Choice: Maximum length = 255; Integer: Maximum length = 11; Float: maximum length = 17.) Also if Type is Choice; In order for a Choice to display as the default for this Field in the Universal Task Details, Default Value must be the Choice Value, not the Choice Label. If Type is Boolean; Specification (a check mark) that the Yes value for this field is the default. If Type is Credential; Default Credential to be used for this Universal Template Field. You can select a Credential from the Default Value drop-down list or click the Details icon next to the Default Value field to create a new Credential. Note Since only Resolvable Credentials can be embedded in a Universal Template script, only Resolvable Credentials display in the Default Value drop-down list for a Credential. If you click the Details icon to create a new Credential, Resolvable is pre-selected for the Type field in the Credential Details and cannot be changed. If Type is Script; Default Script to be used for this Universal Template Field. You can select a Script from the Default Value drop-down list or click the Details icon next to the Default Value field to create a new Script. Note Since only Data Scripts can be embedded in a Universal Template script, only Data Scripts display in the Default Value drop-down list for a Script. If you click the Details icon to create a new Script, Data is pre-selected for the Type field in the Script Details and cannot be changed. If Type is Array; There is no default.

Boolean Value Type	If Type is Boolean: Type of Boolean value for this Field. Options: • true/false (default) • 1/0 • Custom
Yes Value:	If Boolean Value Type is Custom; Boolean Yes value for this Field. (Maximum length = 255 characters).
No Value:	If Boolean Value Type is Custom; Boolean No value for this Field. (Maximum length = 255 characters).
Choice Sort Option	If Type is Choice; Specification for how Choices will be listed in the Choice field drop-down list in the Universal Task Details. Options: • Sequence: Choices will be displayed in the sequence they were created. You can change this sequence manually on the Choices list. • Label: Choices will be displayed alphabetically by Label. Default is Sequence.
Allow Empty Choice	If Type is Choice; Specification for whether or not an empty (blank) option is available for this Choice field in any Universal Task based on this template, allowing the user to clear the value of this field.
Allow Multiple Choices	If Type is Choice; Specification for whether or not more than one choice can be selected at a time. When multiple choices are selected, the built-in field variable will resolve to a comma-delimited String of choice values.
Name Title	If Type is Array; Option to change the default **Name** column for the Array field on any Universal Task based on this template to any other column title (for example, Customer Name).
Value Title	If Type is Array; Option to change the default Value column for the Array field on any Universal Task based on this template to any other column title (for example, Customer ID).
Restriction	If Type is Text, Integer, Boolean, or Float; Specification for whether or not to place an Output Only restriction on the field, which will render it as read-only on a Universal Task Instance Details but not shown on the Universal Task Details.
Preserve Output On Re-run	If Restriction specifies Output Only; Specification for whether or not an Output Only field should preserve its value on a Re-run instead of being cleared.
Dynamic Choice	If Type is Choice; Specification that the field will request its choices dynamically from the Extension.
Dependent Fields	If Dynamic Choice is specified; Fields that should be included when requesting the dynamic choices.
Validation	This section contains validation information about the Field.
Required	If Type is Text, Integer, Credential, or Script; Specification for whether this Field in the template is required (checked) or optional (not checked). If it is required, it will display in **boldface** in any Universal Tasks based on this template. Note If you modify a Universal Template Field to add a Required condition, review and assign an appropriate field value to any Universal Tasks that are no longer in compliance to avoid a Start Failure.

<table>
<tr><td>Require If Field</td><td>If Required is not checked and a Show If Field is not specified; Specification that this Field in the template will be required in any Universal Tasks based on this template if the Choice Field (Choice Field 1-15) or the Boolean Field (Boolean Field 1-10) selected as the Require If Field has a value corresponding to the value(s) defined in the Require If Field Value(s) field.

The Require If Field Value(s) field is not available until you make a Require If Field selection.

Options:

• -- None --
• Boolean Field 1 - Boolean Field 10.
• Choice Field 1 - Choice Field 15.

Note
If you modify a Universal Template Field to add or augment a Require If Field condition, review and assign an appropriate field value to any Universal Tasks that are no longer in compliance to avoid a Start Failure.</td></tr>
<tr><td>Require If Field Value (s)</td><td>If Require If Field is a Choice field, Require If Field Value(s) is a comma-separated list of Choice values.

For example:

<table><tr><th>Require If Field Value (s)</th><th>Description</th></tr><tr><td>1</td><td>Field is required if the Require If Field has a choice value of 1 selected.</td></tr><tr><td>1,2</td><td>Field is required if the Require If Field has a choice value of 1 or 2 selected.</td></tr><tr><td></td><td>Field is required if the Require If Field has the empty choice selected.</td></tr><tr><td>,1</td><td>Field is required if the Require If Field has the empty choice selected or a choice value of 1 selected.</td></tr><tr><td>,1,2</td><td>Field is required if the Require If Field has the empty choice selected or a choice value of 1 or 2 selected.</td></tr></table>

If Require If Field is a Boolean field, Require If Field Value(s) is either true or false.</td></tr>
<tr><td>Show If Field</td><td>If Required is not checked and a Require If Field is not specified; Specification that this Field in the template will be visible in any Universal Tasks based on this template if the Choice Field (Choice Field 1-15) or the Boolean Field (Boolean Field 1-10) selected as the Show If Field has a value corresponding to the value(s) defined in the Show If Field Value(s) field.

The Show If Field Value(s) field is not available until you make a Show If Field selection.

Options:

• -- None --
• Boolean Field 1 - Boolean Field 10.
• Choice Field 1 - Choice Field 15.</td></tr>
</table>

<table>
<tr><td>Show If Field Value (s)</td><td>If Show If Field is a Choice field, the Show If Field Value(s) is a comma-separated list of Choice values.

For example:<table><tr><th>Show If Field Value(s)</th><th>Description</th></tr><tr><td>1</td><td>Field is visible if the Show If Field has a choice value of 1 selected.</td></tr><tr><td>1,2</td><td>Field is visible if the Show If Field has a choice value of 1 or 2 selected.</td></tr><tr><td></td><td>Field is visible if the Show If Field has the empty choice selected.</td></tr><tr><td>,1</td><td>Field is visible if the Show If Field has the empty choice selected or a choice value of 1 selected.</td></tr><tr><td>,1,2</td><td>Field is visible if the Show If Field has the empty choice selected or a choice value of 1 or 2 selected.</td></tr></table>
If Show If Field is a Boolean field, the Show If Field Value(s) is either true or false.</td></tr>
<tr><td>Require If Visible</td><td>If Show If Field is not - - None - -; If selected, specification that the Field is required if it is visible (see Show If Field).

Note

If you modify a Universal Template Field to add a Require If Visible condition, review and assign an appropriate field value to any Universal Tasks that are no longer in compliance to avoid a Start Failure.</td></tr>
<tr><td>No Space If Hidden</td><td>If Show If Field is not - - None - -; If selected, specification that a space should not be reserved in place of the hidden field.</td></tr>
<tr><td>Preserve Value If Hidden</td><td>If Show If Field is not - - None - -; If selected, specification that the value of this field should be preserved if the field is hidden.

Note

A Field with Preserve Value If Hidden = true will be validated even if the Field is hidden.

Also, if a Field's Show If Field or Require If Field specifies a field (for example, Boolean Field 1) that has Preserve Value If Hidden = true, when validating whether the Field is visible or required, Boolean Field 1's value is considered visible.</td></tr>
<tr><td>Length</td><td>If Type is Text or Integer; Length of this Field.

Maximum Lengths:

• Text = 255
• Large Text = 4000
• Integer = 11</td></tr>
<tr><td>Minimum</td><td>If Type is Integer; Minimum value for this field.</td></tr>
<tr><td>Maximum</td><td>If Type is Integer; Maximum value for this field.</td></tr>
<tr><td>Form Layout</td><td>This section contains information about the location of this Field in the Details of Universal Tasks based on this template.

Note

All user-defined Fields in a Universal Template will be located between the Credentials Variable and Runtime Directory fields in the Details section of Universal Tasks based on this template.</td></tr>
</table>

Start Row	If enabled; Specification that this Field will start a new row.
End Row	If enabled; Specification that this Field will end the current row.
Column Span	Number of columns (width) in the Universal Task Details for this Field. Options: • 1 • 2 • 3 Default is 1.
Sequence	For existing Fields only; System-defined; Sequence of this Field among all user-defined Universal Template Fields to be displayed in the Universal Task Details. Starting sequence is 0 for the first defined Field. Note You can change the Sequence of user-defined Universal Template Fields by dragging them to new locations on the Fields list.
Metadata	This section contains Metadata information about this record.
UUID	Universally Unique Identifier of this record.
Updated By	Name of the user that last updated this record.
Updated	Date and time that this record was last updated.
Created By	Name of the user that created this record.
Created	Date and time that this record was created.
Buttons	This section identifies the buttons displayed above and below the Field Details that let you perform various actions.
Save	Saves a new Field record in the Controller database.
Save & New	Saves a new Field record in the Controller database and redisplays empty Details so that you can create another Field.
Save & View	Saves a new Field record in the Controller database and continues to display that record.
New	Displays empty (except for default values) Details for creating a new Field.
Update	Updates the Field record in the Controller database.
Delete	Delete the currently open Field. Note You cannot delete a field if it is the only field in the Template.
Refresh	Refreshes any dynamic data displayed in the Field Details.
Close	Closes the Field Details.

Tabs	This section identifies the tabs across the top of the Field Details that provide access to additional information about the Field.
Choices	If Type is Choice; Allows you to define the Choices for this Field in the template.

Creating Universal Template Field Choices

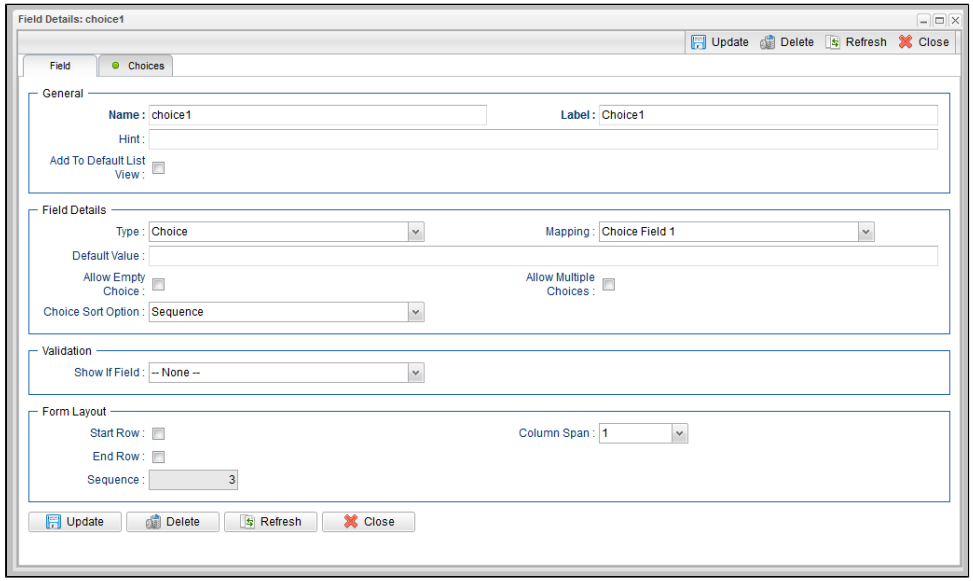
If you created a Choice Field (Type = Choice) for a Universal Template, you must create Choices for that Choice Field that will display in a drop-down list in all Universal Tasks based on this Universal Template.

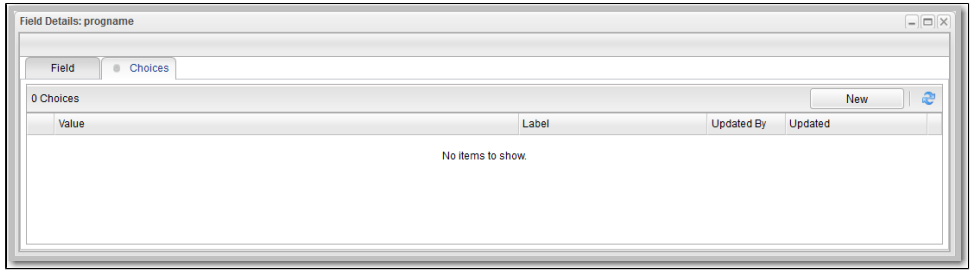
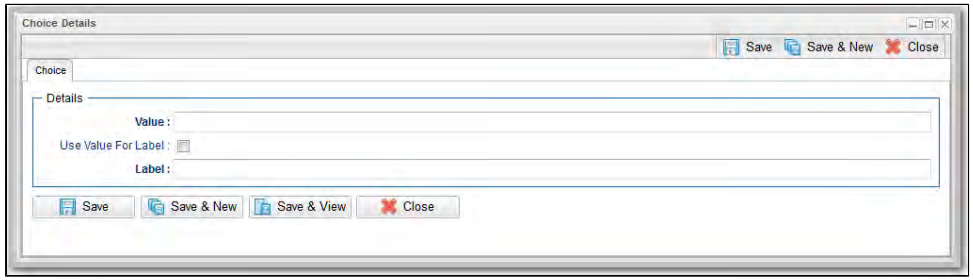
- If you click the **Save** button after creating the Choice Field, the Choices tab (under which is an empty Choices list) is enabled, and an empty Choice Details automatically displays, which lets you create your first Choice.
- If you click the **Save & New** button after creating a Choice Field, so that you can immediately create one or more other Fields, you will have to manually open that Choice Field, click the enabled Choices tab, and then click the **New** button to create your first Choice.

The following procedure assumes that you have created a Choice Field but not yet created any Choices for it.

Step 1

On the Fields list for the Universal Template, open the Choice Field (Type = Choice) whose Choices you want to create.



Step 2	Click the **Choices** tab to display an empty Choices list. 
Step 3	Click **New** to display Choice Details for a new Choice. 
Step 4	Enter Details for a new Choice Field, using the field descriptions below as a guide.
Step 5	Click a **Save** button. Each Choice that you define is added to the Choices list.

Choice Details Field Descriptions

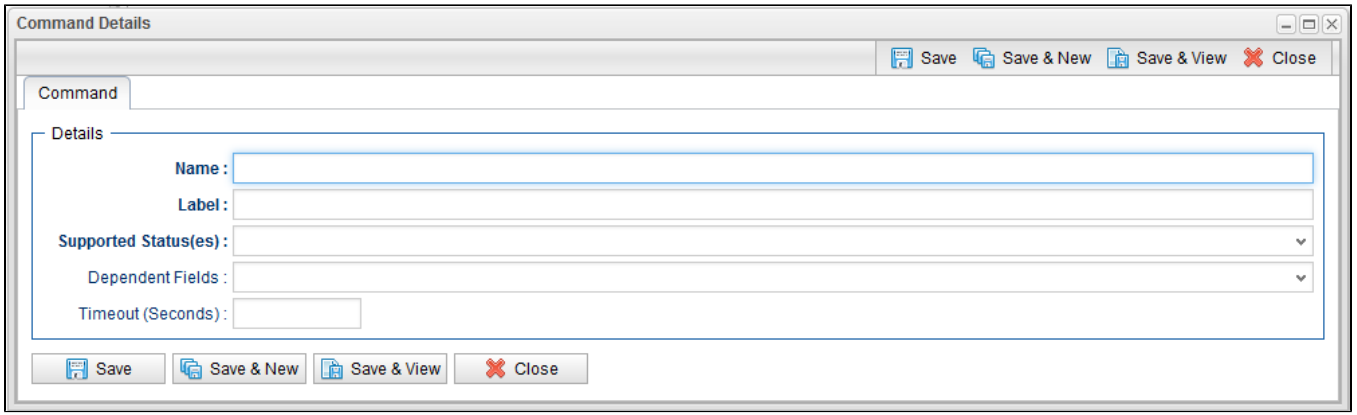
The following table describes the fields, buttons, and tabs that display in the Choice Details.

Field Name	Description
General	This section contains general information about the Field.
Value	Value of this Choice. (Maximum length = 255 characters.)
Use Value For Label	If the Value field value is 50 characters or less; Use the Value field value as the Label field value (which is a maximum 50 characters).
Label	If Use Value For Label is not checked; Name that will display for this Choice in the drop-down list on a Universal Task. (Maximum = 50 characters.)

Sequence	For existing Choices only; System-defined sequence of this Choice among all Choices defined for this Field. Starting sequence is 0 for the first defined Choice. Note If you select Sequence in the Choice Sort Option field in the Details for this Choice Field, you can sort the Choices by clicking and dragging them to any position on the Choices List. In the Details of any Universal Task based on this Universal Template, the Labels for these Choices will display in the Choice Field drop-down list in the order you select.
Metadata	This section contains Metadata information about this record.
UUID	Universally Unique Identifier of this record.
Updated By	Name of the user that last updated this record.
Updated	Date and time that this record was last updated.
Created By	Name of the user that created this record.
Created	Date and time that this record was created.
Buttons	This section identifies the buttons displayed above and below the Choice Details that let you perform various actions.
Save	Saves a new Choice record in the Controller database.
Save & New	Saves a new Choice record in the Controller database and redisplays empty Details so that you can create another Choice.
Save & View	Saves a new Choice record in the Controller database and continues to display that record.
New	Displays empty (except for default values) Details for creating a new Choice.
Update	Updates the Choice record in the Controller database.
Delete	Deletes the currently open Choice. Note You cannot delete a Choice if it is the only Choice for the Field.
Refresh	Refreshes any dynamic data displayed in the Choice Details.
Close	Closes the Choice Details.

Creating Commands

Commands allow you to define additional operations against a task instance.



Field Name	Description
Name	Unique name of this command, adhering to the same naming convention as a Universal Template field name.
Label	User-friendly display name for the command, to be displayed within the client.
Supported Status(es)	Task instance status(es) that the dynamic command should be enabled for.
Dependent Fields	Universal Template fields (if any) that are required by the command. The values of those fields are included in the command request.
Timeout (Seconds)	Optional command timeout, in seconds, if the command requires longer than the System-level default of 60 seconds. If the controller (server) does not receive a command response from the Extension prior to the timeout being reached, a timeout message will be sent to the client (user interface), and displayed in the console. However, the server-side handling of the command response, like the persistence of command output, will still be handled by the server after the timeout occurs.

Command Permission

Users must have **Universal** (or **ALL**) command permission and **Read** permission for the Universal Task Instance, assigned by the **Task Instance** permission type, for authorization to execute a Universal dynamic command.

Command Output

Optionally, a dynamic command can return output in the response, which would be displayed immediately to the user who issued the command.

A user can view the output generated by the command later by going to the **Task Instance**>**Output** tab.

The **Type** will show as **COMMAND**, and to allow for better correlation, a new **Command Name** field will display the label of the command that generated the output.

Copying Universal Templates

- Overview
- Copying One or More Universal Templates from a Universal Templates List
- Copying a Universal Template from the Universal Template Details
- Copy Permissions

Overview

You can make copies of all Universal Controller records, including Universal Templates, using the standard method for Copying a Record: selecting **Insert** on the Action menu.

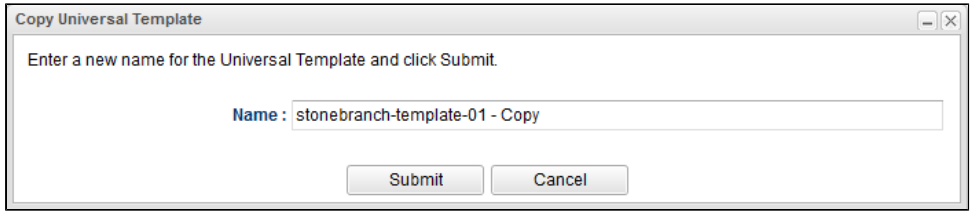
However, you also can use the Copy action on the Universal Template Action menu or the Copy button in the Universal Template Details.

Copying a Universal Template will copy the following:

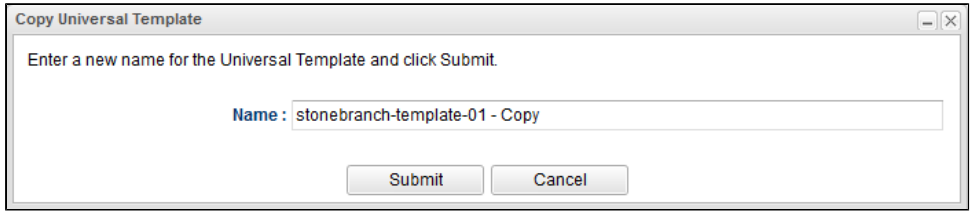
- Universal Template record.
- Universal Template Field records for the Universal Template parent record.
- Universal Template Field Choice records for the Choice type Universal Template Field parent records.

Copying One or More Universal Templates from a Universal Templates List

Step 1	From the Administration navigation pane, select **Configuration> Universal Templates** to display the Universal Templates list.
Step 2	Locate the Universal Template(s) you want to copy (see Filtering).

Step 3	Copy the Universal Template(s): **Copy One Universal Template** 1. Right-click the **Universal Template Name**. 2. On the Action menu, select **Copy**. A Copy Universal Template pop-up dialog displays.  3. Enter a new name for the Universal Template. 4. Click **Submit** to create a copy of the Universal Template. **Copy Multiple Universal Templates** 1. Ctrl-Click the Universal Templates you want to copy. 2. Right-click any of the selected Universal Templates. 3. On the Action menu, select **Copy**. 4. On the Confirmation pop-up that displays, click **OK**. The copied Universal Templates are added to the list, with **- Copy** added as a suffix to the Universal Template Name for each Universal Template. If a Universal Template with that **- Copy** name already exists, another copy is not created.

Copying a Universal Template from the Universal Template Details

Step 1	Select a Universal Template from the Universal Template list. The Universal Template Details for that Universal Template displays.
Step 2	Either: - Click the **Copy** button. - Right-click the Details to display the Action menu, and then click **Copy**. A Copy Universal Template pop-up dialog displays. 
Step 3	Enter a new name for the Universal Template.

Step 4	Click **Submit** to create a copy of the Universal Template.

Copy Permissions

To copy a Universal Template, you must have either the ops_admin or ops_universal_template_admin role.

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Built-In Universal Templates

- Introduction
- Available Built-In Universal Templates

Introduction

Specific Universal Templates are delivered with the Universal Controller installation package.

These Built-in Universal Templates are delivered READ ONLY; if you require changes to a Built-In Universal Template, you have to copy the Built-in Universal Template to create a new Universal Template, which you then can edit with the ops_universal_template_admin security role. Stonebranch does not provide support or updates for new Universal Templates created from the Built-in Universal Templates.

To use a Built-In Universal Template, you first must load it from the List/Load Built-In Universal Templates Server Operation.

Open source Universal Templates will continue to be made available via the Stonebranch Marketplace. Customers can access the the Stonebranch Marketplace from the Stonebranch Customer Portal.

Available Built-In Universal Templates

The following tabled identifies the Built-In Universal Templates that are available for Universal Controller release 6.9.0.0.

The Name of each Universal Template is a link to a separate page containing detailed information about that template.

(For additional information about Universal Templates, see Universal Templates.)

Name	Description	Available from Release
UAC - SSH Tasks	Execute Command or Script on Remote SSH Server with no UC Agent Installed, Remote Server Requires an SSH Server.	UC 6.8.0.0
UAC - UDM Gateway Tasks	UDM Gateway Integration Tasks.	UC 6.8.0.0
UAC - Docker Image	Universal Task to manage Docker Images, Build, Remove, Pull, Push, and Tag Functions.	UC 6.9.0.0
UAC - Docker Container	Universal Task to manage Docker Containers, Run, Create, Start, Stop and Remove Functions.	UC 6.9.0.0
UAC - Docker Compose	Universal Task for Docker Compose Functions, Build, Up, Down, Start, Stop Functions.	UC 6.9.0.0
UAC - Powershell	Universal Task to Run Powershell Scripts.	UC 6.9.0.0
UAC - Kubernetes	Kubernetes List (Get), Create, Delete and Replace Functions.	UC 6.9.0.0
UAC - UA Install	Install UA via SSH Server, Download UA install from SB Website.	UC 6.9.0.0
UAC - Remote Controller	Run Task or Workflow on a Remote Universal Controller.	UC 6.9.0.0
UAC - UC Report	Run a Universal Controller report and deliver output to a specified server and file location.	UC 6.9.0.0

UAC - SSH Tasks

- Overview
- Example Output
- Universal Task Details Fields

Overview

Universal Task to run a command or Universal Controller "data" script on a remote ssh server.

Enables the execution of commands and scripts from the Universal Controller script library on a remote Unix. Linux, or Windows SSH server.

- The Universal Task will end with the exit code from the remote command / script.
- Both stdout and stderr from the remote task are returned to the Universal Task's stdout. Stderr is used for messages from the Universal Task itself.
- Requires Python 3.6 or higher with the ssh2-python module installed. Tested with the Universal Agent bundled Python distribution.
- You can set different log-levels for the Universal task, providing you more or less information to suit your needs.

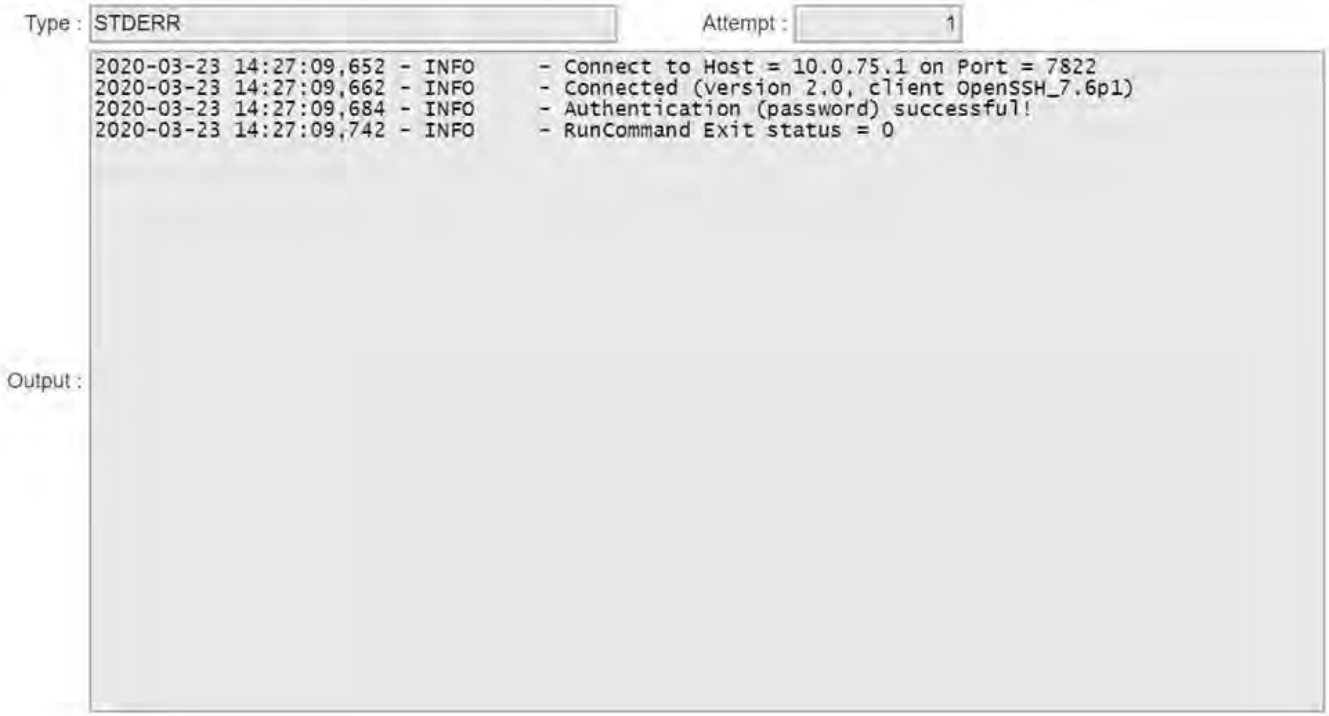
An SSH task is unable to provide the following functionality that is available for tasks that execute on a Universal Agent.

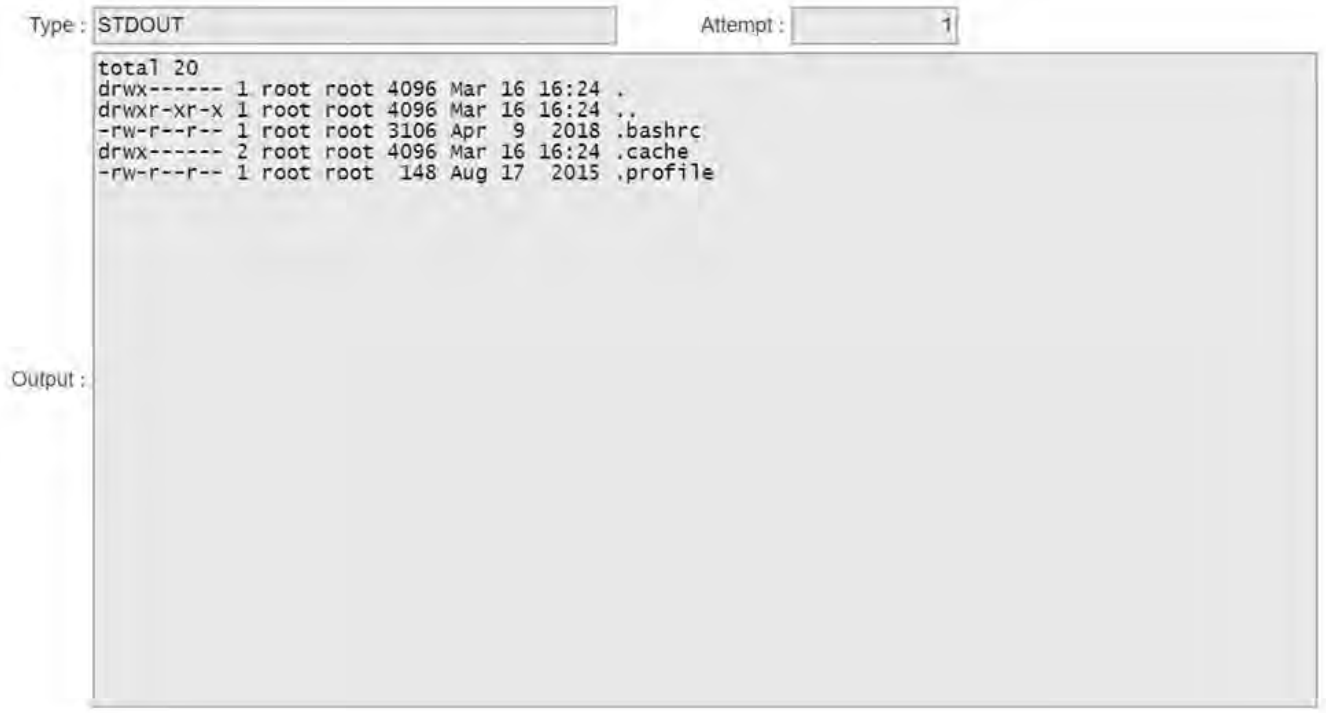
- No Agent visibility, status, or alerting is available
- The remote command or script cannot be cancelled from the controller UI, cancelling the SSH task will only cancel the Universal Task Python script that is initiating the SSH session
- No fault tolerant functionality
- No clustering, load balancing, or broadcast functionality

The Universal Task performs the following:

1. Connects to the Remote SSH Server
2. Authenticates to the Remote SSH Server via Userid and Password or SSH Public Key.
3. Execute Command on SSH Server or Transfer UC Data Script to Remote SSH Server and Execute.

Example Output


Type : STDERR
Attempt : 1
2020-03-23 14:27:09,652 - INFO - Connect to Host = 10.0.75.1 on Port = 7822
2020-03-23 14:27:09,662 - INFO - Connected (version 2.0, client OpenSSH_7.6p1)
2020-03-23 14:27:09,684 - INFO - Authentication (password) successful!
2020-03-23 14:27:09,742 - INFO - RunCommand Exit status = 0
Output :



Universal Task Details Fields

Field Label	Description	Example	Required
Remote SSH Server	Specify the Hostname for the Remote SSH Server	mysshserver	Y
Remote SSH Port	Specify the SSH port for the Remote SSH Server	22	Y
Remote SSH Credential	Select the Credential Definition to access the Remote SSH Server. If the Credential specifies a Key Location, Public Key Authentication will be performed.		Y
Command or Script	Specify whether to execute a Command, or Transfer and Execute a UC Data Script.		Y

Command	Command To be Executed on the Remote SSH Server	ls -la	Y (If Command or Script = Command)
Script	UC Data Script to be transferred and Executed on the Remote SSH server		Y (If Command or Script = Script)

UAC - UDM Gateway Tasks

- Overview
  - Example Output
  - Universal Task Details Fields

Overview

For integration of WLA / Job Scheduling with the UDM Gateway File Transfer solution. Universal Controller customers can implement the provided Universal Task.

- Universal Task requires Universal Controller Version 6.7.0.0 or higher.
- Uses the UDM Gateway Rest API (requires UDM Gateway Version 11 or higher).
- Requires Python 3.6 or higher with the requests module installed. Tested with the Universal Agent bundled Python distribution.
- Stdout returns information from the UDM Gateway. Stderr is used for messages from the Universal Task / Script itself.
- You can set different log-levels, providing you more or less information to suit your needs.

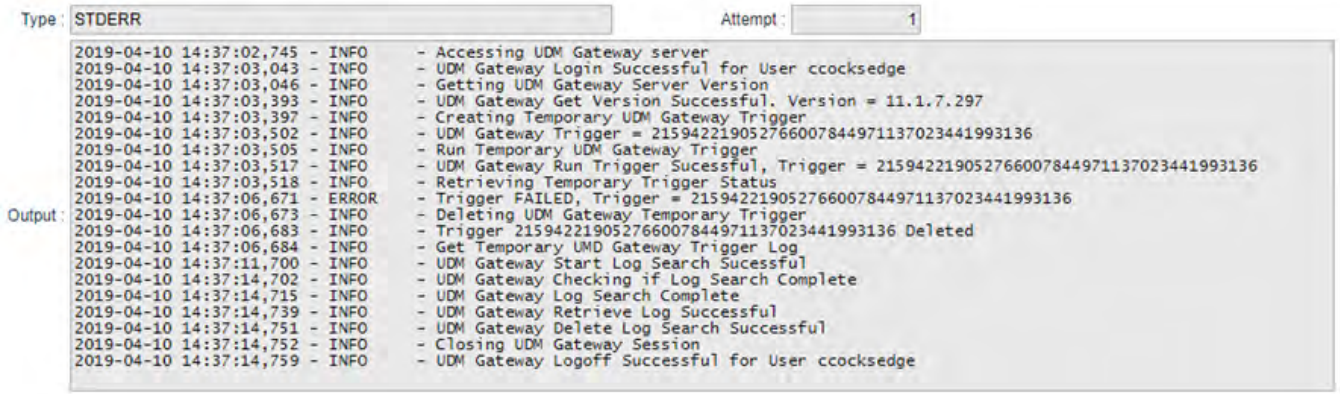
The Universal Task can automate the following UDM Gateway functions:

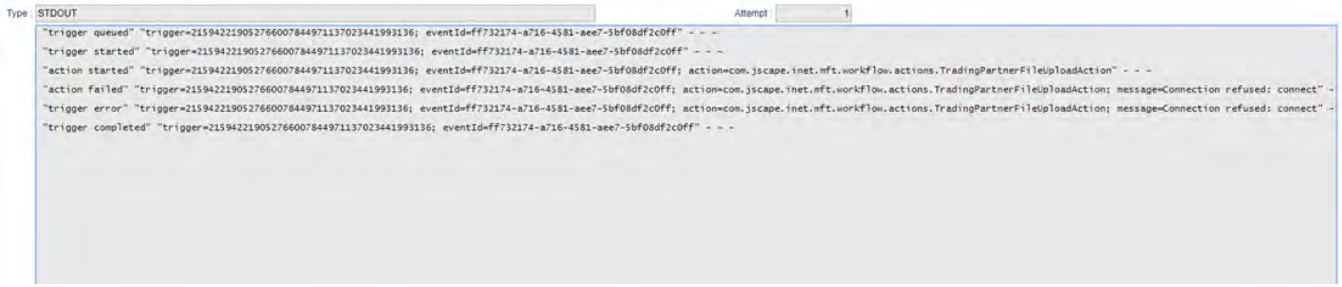
- PGP Encrypt
- PGP Decrypt
- Run a UDM Gateway Trigger
- SFTP File Upload
- SFTP File Download
- Trading Partner File Upload
- Trading Partner File Download
- Trading Partner File Upload using a Regex or Generic Filename Pattern
- Trading Partner File Download using a Regex or Generic Filename Pattern

The Universal Task performs the following:

1. Login to UDM Gateway Server
2. Check UDM Gateway Server Version
3. Create Temporary UDM Gateway Trigger with a unique name to perform the desired action. Except Run Trigger which copies the existing trigger to the temporary trigger.
4. Run Temporary UDM Gateway Trigger.
5. Get Temporary UDM Gateway Trigger Status
6. Delete Temp Trigger
7. Retrieve Trigger Log
8. Close UDM Gateway Session

Example Output



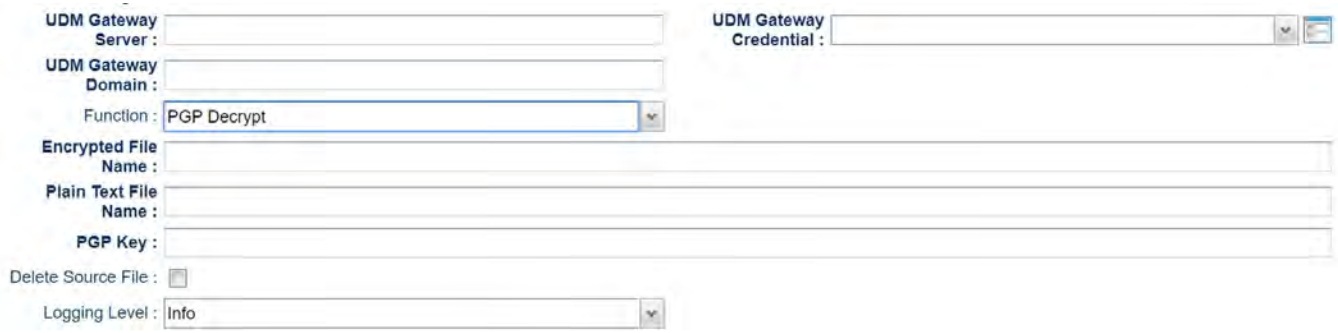


Universal Task Details Fields

Function = PGP Encrypt

Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the PGP Encrypt Function		Y
Encrypted File Name	The name of the target encrypted file	/demo/my-data.pgp	Y
Plain Text File Name	The name of the source plaintext file	/demo/my-data.txt	Y
PGP Key	PGP Key to use for encryption	secret: LocalDemo <stonebranch.demo@stonebranch.com>	Y
Delete Source File	Specify if the source plaintext file is deleted		Y
Compress	Specify if the target encrypted file is compressed		Y
Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

Function = PGP Decrypt



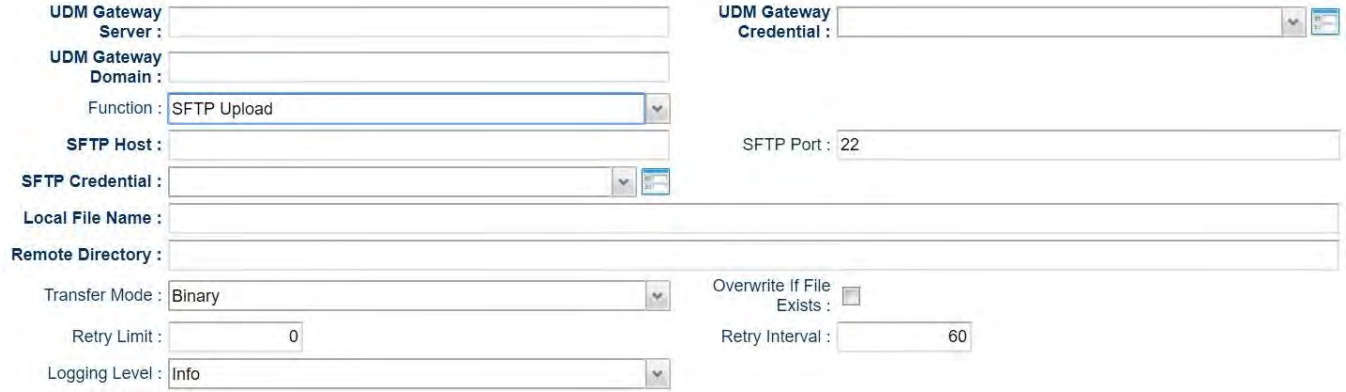
Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the PGP Decrypt Function		Y

Encrypted File Name	The name of the target encrypted file	/demo/my-data.pgp	Y
Plain Text File Name	The name of the source plaintext file	/demo/my-data.txt	Y
PGP Key	PGP Key to use for encryption	secret: LocalDemo <stonebranch.demo@stonebranch.com>	Y
Delete Source File	Specify if the source plaintext file is deleted		Y
Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

Function = Run Trigger

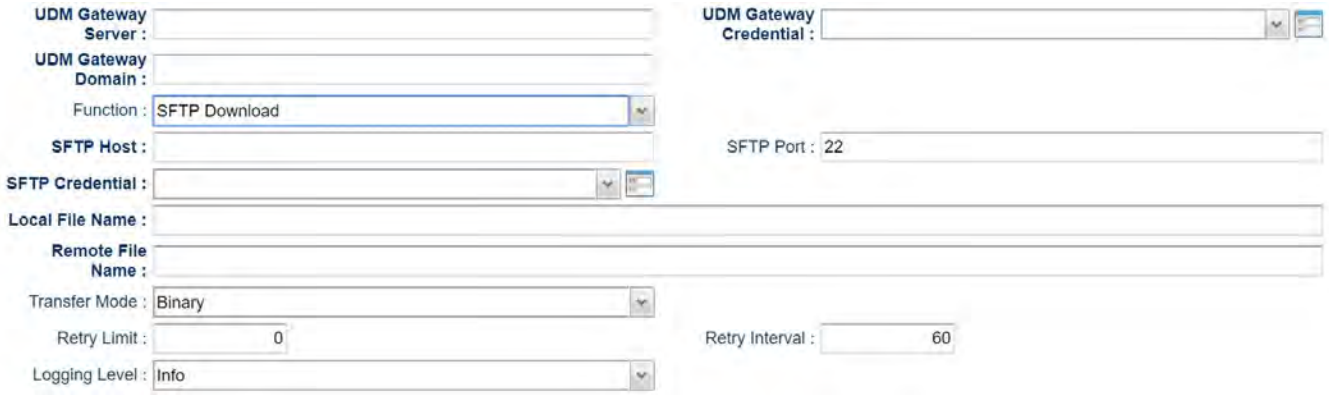
Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the Run Trigger Function		Y
Trigger Name	Provide the name of an existing UDMG Trigger	Test Trigger	Y
Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

Function = SFTP Upload



Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the SFTP Upload Function		Y
SFTP Host	Remote SFTP server Host Name or IP	127.0.0.1	Y
SFTP Port	Remote SFTP server port	22	N
SFTP Credential	Select the Credential Definition to access the remote SFTP server		Y
Local File Name	Location of the Local File	/demo/my-data.pgp	Y
Remote Directory	Remote SFTP Server Directory	/	Y
Transfer Mode	Transfer Mode (Ascii, Binary, Auto)	Ascii	N
Overwrite if File Exists	Overwrite destination file(s) if it exists		N
Retry Limit	Maximum Retry Attempts	0	N
Retry Interval	Interval in Seconds Between Retries	60	N
Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

Function = SFTP Download



Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the SFTP Download Function		Y
SFTP Host	Remote SFTP server Host Name or IP	127.0.0.1	Y
SFTP Port	Remote SFTP server port	22	N
SFTP Credential	Select the Credential Definition to access the remote SFTP server		Y
Local File Name	Location of the Local File	/demo/my-data.pgp	Y
Remote File Name	Remote SFTP File	/my-data.pgp	Y
Transfer Mode	Transfer Mode (Ascii, Binary, Auto)	Ascii	N
Retry Limit	Maximum Retry Attempts	0	N
Retry Interval	Interval in Seconds Between Retries	60	N
Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

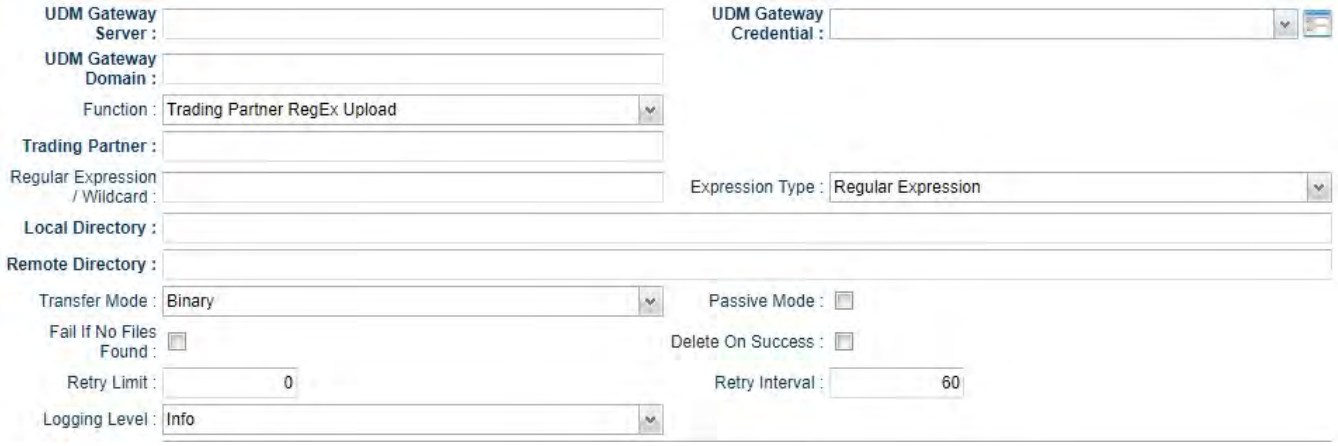
Function = Trading Partner Upload

Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the Trading Partner Upload Function		Y
Trading Partner	UDM Gateway Trading Partner definition	Customer A	Y
Local File Name	Location of the Local File	/demo/my-data.pgp	Y
Remote Directory	Remote Trading Partner Directory	/	Y
Transfer Mode	Transfer Mode (Ascii, Binary, Auto)	Ascii	N
Passive Mode	Passive Mode (true, false)		N
Retry Limit	Maximum Retry Attempts	0	N
Retry Interval	Interval in Seconds Between Retries	60	N
Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

Function = Trading Partner Download

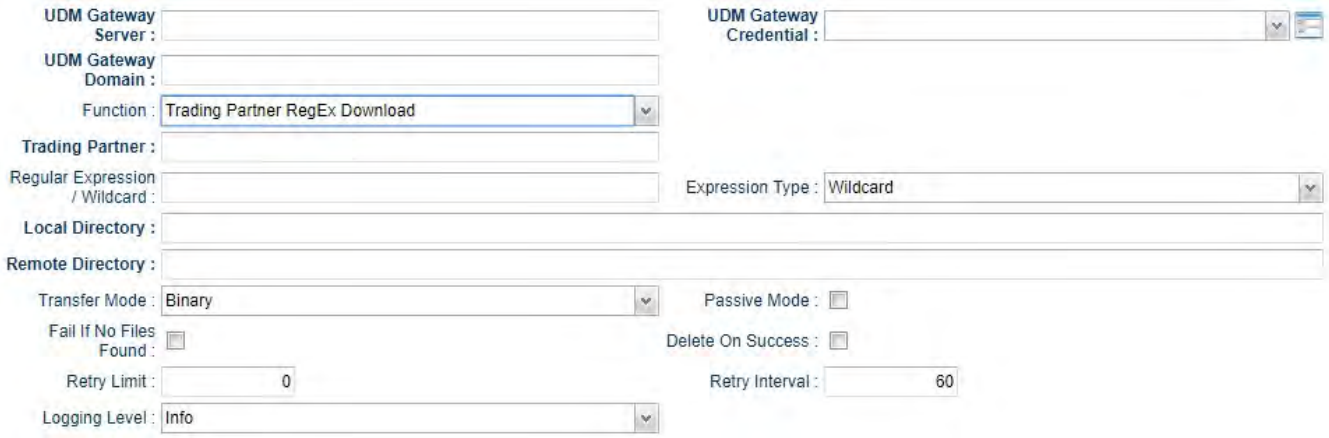
Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the Trading Partner Download Function		Y
Trading Partner	UDM Gateway Trading Partner definition	Customer A	Y
Local File Name	Location of the Local File	/demo/my-data.pgp	Y
Remote File Name	Remote Trading Partner File	/my-data.pgp	Y
Transfer Mode	Transfer Mode (Ascii, Binary, Auto)	Ascii	N
Passive Mode	Passive Mode (true, false)		N
Retry Limit	Maximum Retry Attempts	0	N
Retry Interval	Interval in Seconds Between Retries	60	N
Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

Function = Trading Partner RegEx Upload



Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the Trading Partner RegEx Upload Function		Y
Trading Partner	UDM Gateway Trading Partner definition	Customer A	Y
Regular Expression / Wildcard	Specify the Regular Expression or Wildcard	*.txt	N
Expression Type	Select either "Regular Expression" or "Widlcard"		Y
Local Directory	Location of the Local File	/demo	Y
Remote Directory	Remote Trading Partner Directory	/	Y
Transfer Mode	Transfer Mode (Ascii, Binary, Auto)	Ascii	N
Passive Mode	Passive Mode (true, false)		N
Fail if No Files Found	Specify whether the task should fail if no files match the specified expression (Regular Expression or Wildcard)		N
Delete on Success	Specify whether files should be deleted after successful transfer		N
Retry Limit	Maximum Retry Attempts	0	N
Retry Interval	Interval in Seconds Between Retries	60	N
Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

Function = Trading Partner RegEx Download



Field Label	Description	Example	Required
UDM Gateway Server	Specify the URL for the UDM Gateway Server	https://localhost:11880	Y
UDM Gateway Credential	Select the Credential Definition to access the UDM Gateway Server		Y
UDM Gateway Domain	UDM Gateway Server Domain	Local	Y
Function	Select the Trading Partner RegEx Download Function		Y
Trading Partner	UDM Gateway Trading Partner definition	Customer A	Y
Regular Expression / Wildcard	Specify the Regular Expression or Wildcard	*.txt	Y
Expression Type	Select either "Regular Expression" or "Widlcard"		Y
Local Directory	Location of the Local File	/demo	Y
Remote Directory	Remote Trading Partner Directory	/	Y
Transfer Mode	Transfer Mode (Ascii, Binary, Auto)	Ascii	N
Passive Mode	Passive Mode (true, false)		N
Fail if No Files Found	Specify whether the task should fail if no files match the specified expression (Regular Expression or Wildcard)		N
Delete on Success	Specify whether files should be deleted after successful transfer		N
Retry Limit	Maximum Retry Attempts	0	N
Retry Interval	Interval in Seconds Between Retries	60	N

Logging Level	Controls messages issues from the Universal Task Script • None • Info • Debug • Warning • Critical	None	Y

UAC - Docker Image

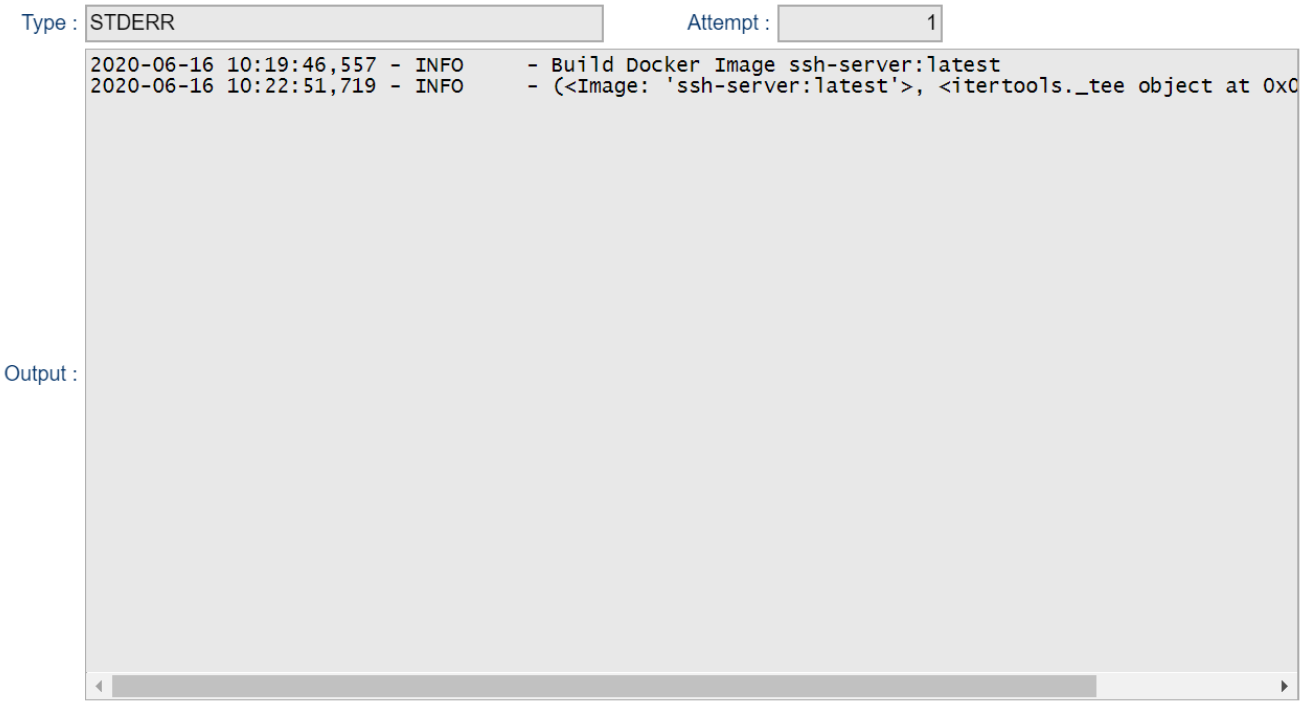
- Universal Task to Manage Docker Images; Run, Create, Start, Stop, and Remove Functions
- Example Output
- Universal Task Details Fields
  - Docker Function = Build
  - Docker Function = Remove
  - Docker Function = Pull
  - Docker Function = Push
  - Docker Function = Tag

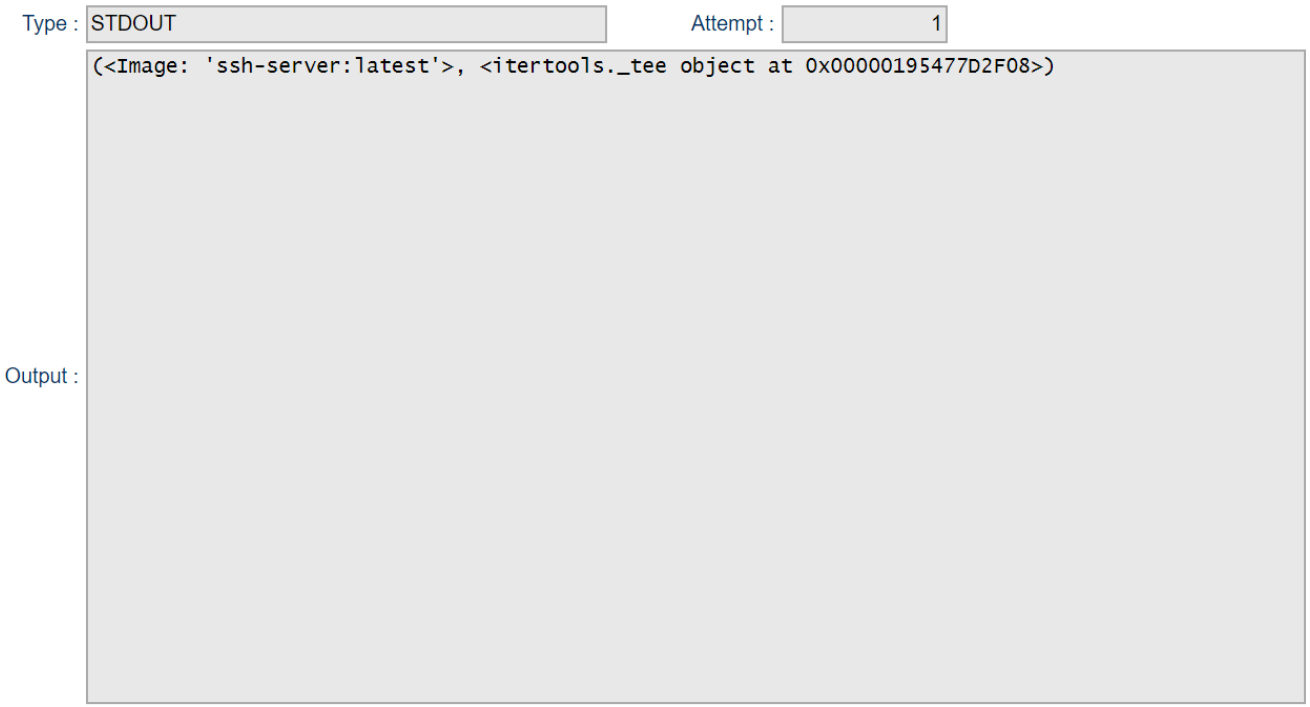
Universal Task to Manage Docker Images; Run, Create, Start, Stop, and Remove Functions

This Universal Task can automate the following Docker Image functions:

- Build
- Remove
- Pull
- Push
- Tag

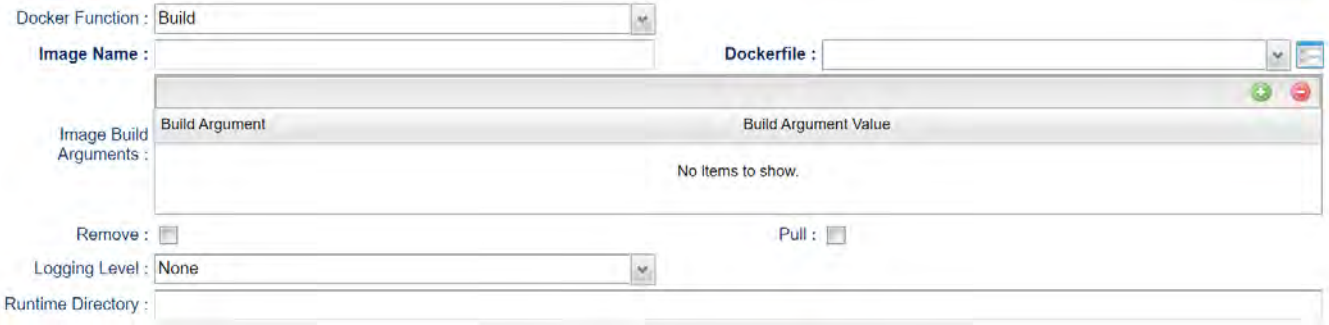
Example Output


Type :
STDERR
Attempt :
1
Output :
2020-06-16 10:19:46,557 - INFO - Build Docker Image ssh-server:latest
2020-06-16 10:22:51,719 - INFO - (<Image: 'ssh-server:latest'>, <itertools._tee object at 0x0



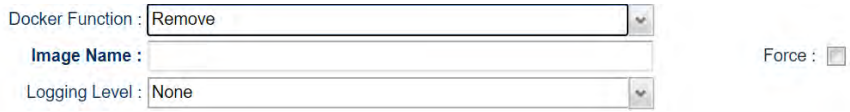
Universal Task Details Fields

Docker Function = Build



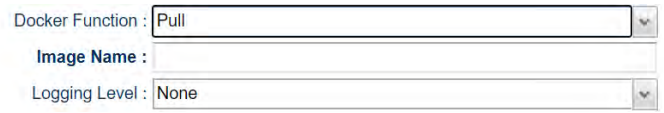
Field Label	Description	Example
Image Name	Docker Image Name (including tag)	myimage:latest
Dockerfile	Select the required dockerfile from the UC script library	
Image Build Arguments	Specify options to pass to the docker image build	
Remove	Always remove intermediate containers, even after unsuccessful builds	
Pull	Always attempt to pull a newer version of the base image	
Logging Level	Controls messages issued from the Universal Task: • None • Info • Debug • Warning • Critical	None
Runtime Directory	Will be used as the build context	/docker/builds/myimage

Docker Function = Remove



Field Label	Description	Example
Image Name	Docker Image Name (including tag)	myimage:latest
Force	Force the removal of a running container or image	
Logging Level	Controls messages issued from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Pull

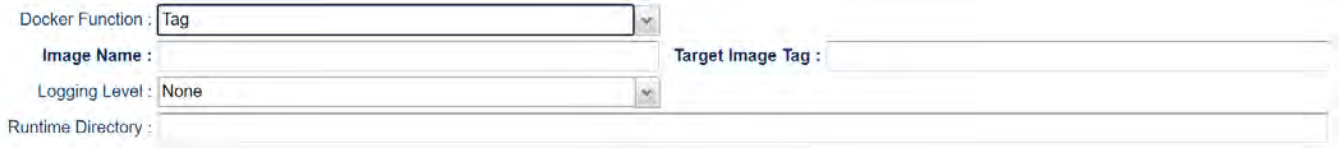


Field Label	Description	Example
Image Name	Docker Image Name (including tag)	stonebranch/universal-agent:latest
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Push

Field Label	Description	Example
Image Name	Docker Image Name (including tag)	stonebranch/universal-agent:latest
Repository Credential	Docker Repository Credential	
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Tag



Field Label	Description	Example
Image Name	Docker Image Name (including tag)	universal-agent:6.8.0.0
Target Image Tag	Target Image that refers to source image	universal-agent:latest
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

UAC - Docker Container

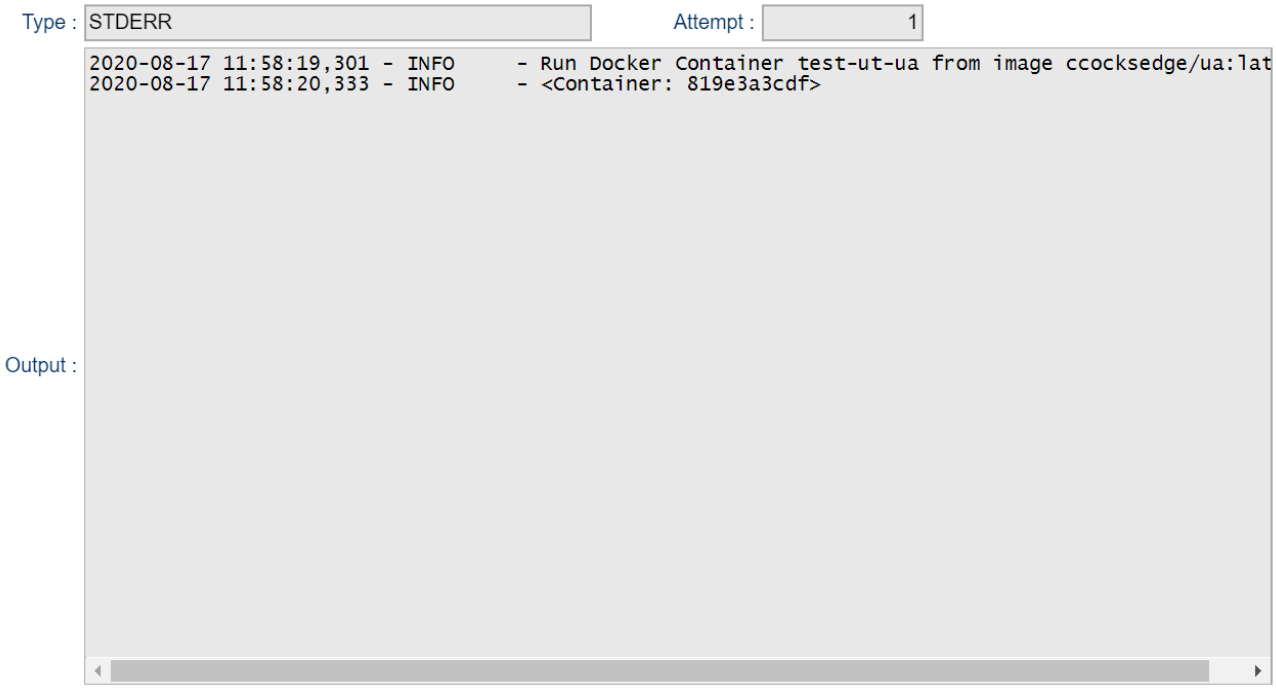
- Universal Task to Manage Docker Container; Run, Create, Start, Stop and Remove Functions
- Example Output
- Universal Task Details Fields
  - Docker Function = Run
  - Docker Function = Create
  - Docker Function = Start
  - Docker Function = Stop
  - Docker Function = Remove

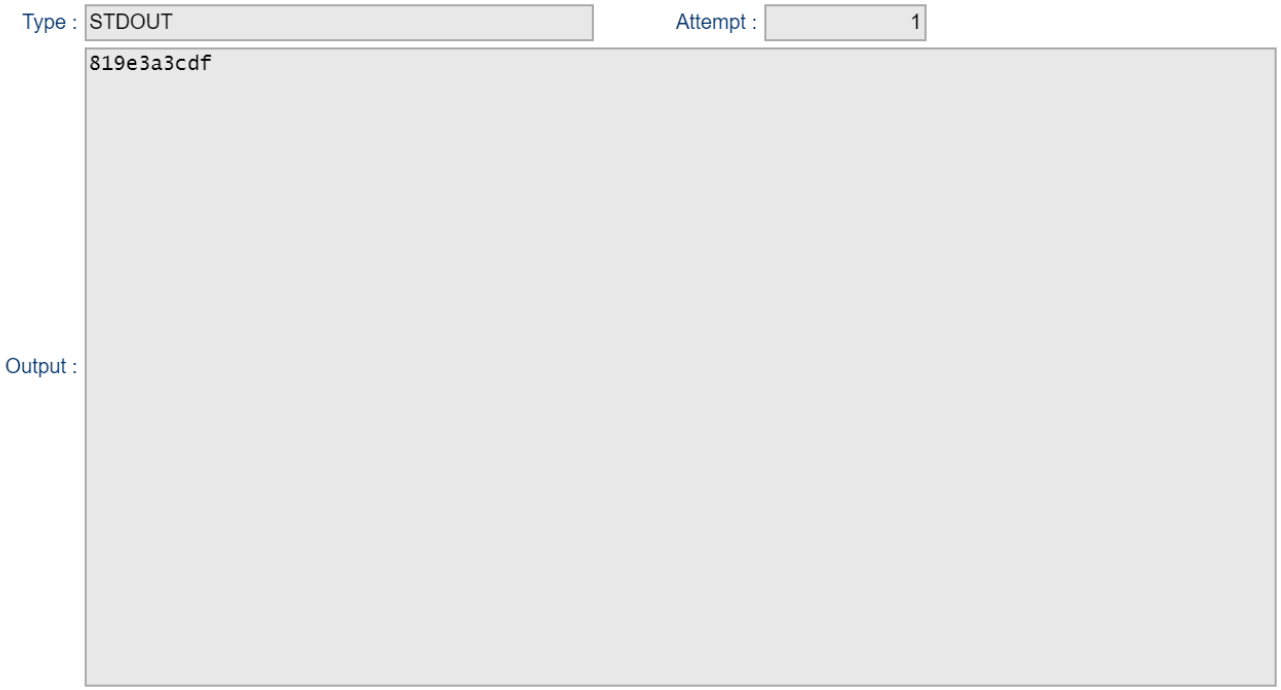
Universal Task to Manage Docker Container; Run, Create, Start, Stop and Remove Functions

The Universal Task can automate the following Docker Container functions:

- Run
- Create
- Start
- Stop
- Remove

Example Output


Type :
STDERR
Attempt :
1
Output :
2020-08-17 11:58:19,301 - INFO - Run Docker Container test-ut-ua from image ccocksedge/ua:lat
2020-08-17 11:58:20,333 - INFO - <Container: 819e3a3cdf>



Universal Task Details Fields

Docker Function = Run

Field Label	Description	Example
Image Name	Docker Image Name (including tag)	myimage:latest
Container Name	Docker Container Name	mycontainer
Hostname	Docker Container Hostname	myhost
Detach	Run Container in background and print Container ID	
Remove	Automatically remove the container	
Command	Command to Run in the Container	echo "Hello World"
Container Environment Variables	Set Container Environment Variable Values	
Container Port Mapping	Specify specific Container ports to map to specific Host ports	

Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Create

Field Label	Description	Example
Image Name	Docker Image Name (including tag)	myimage:latest
Container Name	Docker Container Name	mycontainer
Hostname	Docker Container Hostname	myhost
Command	Command to Run in the Container	echo "Hello World"
Container Environment Variables	Set Container Environment Variable Values	
Container Port Mapping	Specify specific Container ports to map to specific Host ports	
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Start

Field Label	Description	Example
Container Name	Docker Container Name	mycontainer
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Stop

Field Label	Description	Example
Container Name	Docker Container Name	mycontainer
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Remove

Field Label	Description	Example
Container Name	Docker Container Name	mycontainer
Force	Force the removal of a running container (uses SIGKILL)	
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

UAC - Docker Compose

- Universal Task for Docker Compose Functions; Build, Up, Down, Start, Stop Functions
- Example Output
- Universal Task Details Fields
  - Docker Function = Build
  - Docker Function = Up
  - Docker Function = Down
  - Docker Function = Start
  - Docker Function = Stop

Universal Task for Docker Compose Functions; Build, Up, Down, Start, Stop Functions

The Universal Task can automate the following Docker Compose functions:

- Build
- Up
- Down
- Start
- Stop

Example Output

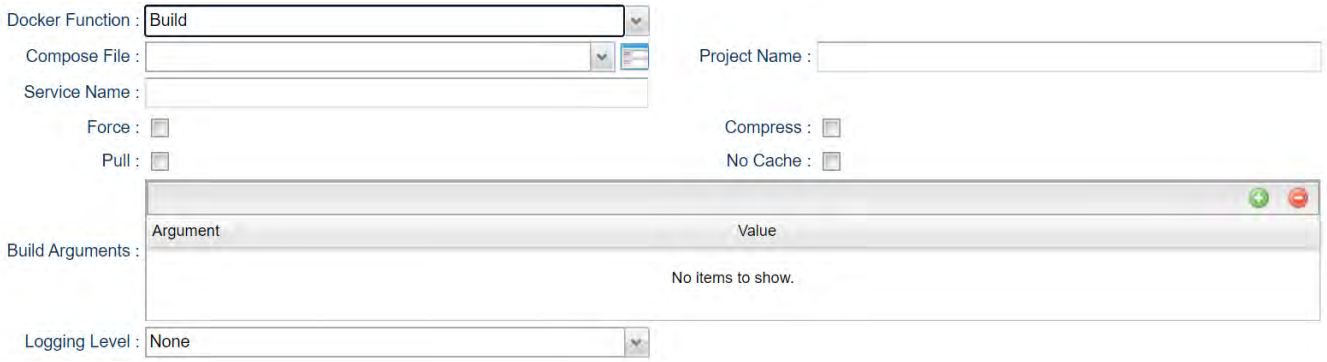
Type : STDERR Attempt : 1

Output :

```
2020-08-17 12:44:36,270 - INFO     - Docker Project uacdev Action Stop
2020-08-17 12:44:47,688 - INFO     - Docker Project uacdev Action stop
```

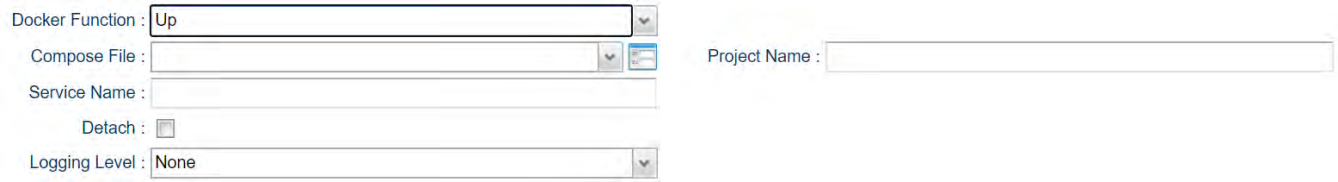
Universal Task Details Fields

Docker Function = Build



Field Label	Description	Example
Compose File	Universal Controller Script (Type = Data) that contains the required compose file YAML statements	
Project Name	Docker Compose Project Name	myproject
Service Name	Optional Service Name as defined in the Compose File	myservice
Force	Always remove intermediate containers, even after unsuccessful builds	
Compress	Compress the build context using gzip	
Pull	Always attempt to pull a newer version of the base image	
No Cache	Do not use Cache when building the image	
Build Arguments	Specify any build arguments	
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None
Runtime Directory	Will be used as the build context	/docker/builds/myimage

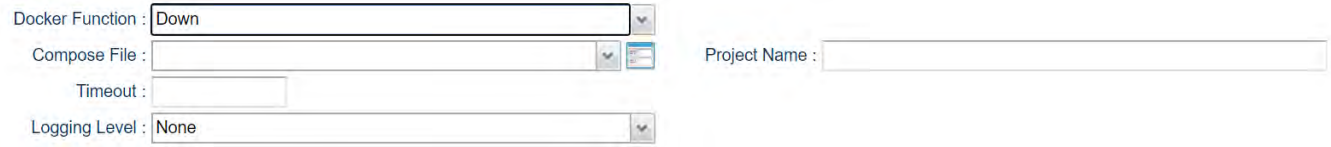
Docker Function = Up



Field Label	Description	Example
Compose File	Universal Controller Script (Type = Data) that contains the required compose file YAML statements	
Project Name	Docker Compose Project Name	myproject
Service Name	Optional Service Name as defined in the Compose File	myservice
Detach	Run Project / Service in background	

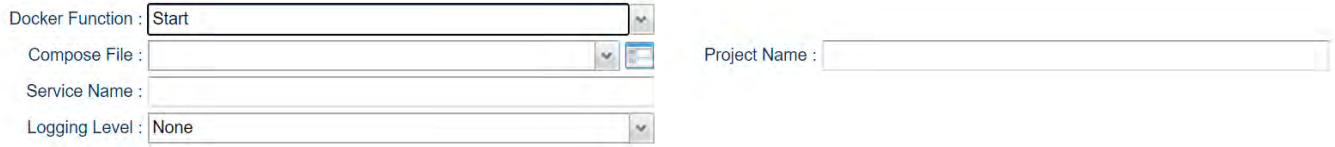
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Down



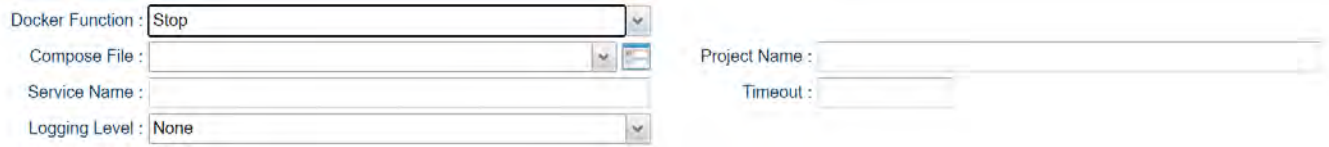
Field Label	Description	Example
Compose File	Universal Controller Script (Type = Data) that contains the required compose file YAML statements	
Project Name	Docker Compose Project Name	myproject
Timeout	Specify a shutdown timeout in seconds (default: 10)	25
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Start



Field Label	Description	Example
Compose File	Universal Controller Script (Type = Data) that contains the required compose file YAML statements	
Project Name	Docker Compose Project Name	myproject
Service Name	Optional Service Name as defined in the Compose File	myservice
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Docker Function = Stop



Field Label	Description	Example
Compose File	Universal Controller Script (Type = Data) that contains the required compose file YAML statements	
Project Name	Docker Compose Project Name	myproject
Service Name	Optional Service Name as defined in the Compose File	myservice
Timeout	Specify a shutdown timeout in seconds (default: 10)	25
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

UAC - Powershell

- Universal Task to Run Powershell Scripts
- Universal Task Details Fields
  - Powershell Script Location = UC Script Library
  - Powershell Script Location = Server Disk

Universal Task to Run Powershell Scripts

Universal Task Details Fields

Powershell Script Location = UC Script Library

This option executes a powershell script from the Universal Controller Script Library. Scripts to be executed from this task must be Script Type = Data and the Script Name must end in .ps1.

Field Label	Description	Example
Powershell Script	Select the required Powershell Script fro the Universal Controller Script Library.	
Powershell Script Options	Specify any required options and their values to be passed to the Powershell Script. Note: • Powershell Script options should be prefixed with a "-". • It may be required to quote any values that contain spaces or special charaters.	

Powershell Script Location = Server Disk

This option executes a Powershell Script from the Agent server's files system.

Field Label	Description	Example
Powershell Script	Specify the script on the Agent server's files system. Note: You can optionally use the Run Time Directory field to specify the script's location or use a fully qualified path/name in this field.	C:\scripts\myscript.ps1

Powershell Script Options	Specify any required options and their values to be passed to the Powershell Script. Note: • Powershell Script options should be prefixed with a "-". • It may be required to quote any values that contain spaces or special charaters.	

UAC - Kubernetes

- Universal Task to Run Kubernetes; List (Get), Create, Delete, and Replace Functions.
- Example Output
- Universal Task Details Fields
  - Function = List (Get)
  - Function = Create
  - Function = Delete
  - Function = Replace

Universal Task to Run Kubernetes; List (Get), Create, Delete, and Replace Functions.

The Universal Task can automate the following Kubernetes functions:

- List
- Create
- Delete
- Replace

Example Output

Type : STDOUT Attempt : 1

Output :

```
{'api_version': 'v1',
 'kind': 'Namespace',
 'metadata': {'annotations': None,
              'cluster_name': None,
              'creation_timestamp': datetime.datetime(2020, 6, 2, 14, 0, 34, tzinfo=tzutc()),
              'deletion_grace_period_seconds': None,
              'deletion_timestamp': None,
              'finalizers': None,
              'generate_name': None,
              'generation': None,
              'initializers': None,
              'labels': {'name': 'stonebranch'},
              'managed_fields': None,
              'name': 'stonebranch',
              'namespace': None,
              'owner_references': None,
              'resource_version': '856519',
              'self_link': '/api/v1/namespaces/stonebranch',
              'uid': 'af6c9ad9-cbad-4938-8dda-2ad23088db88'},
 'spec': {'finalizers': ['kubernetes']},
 'status': {'phase': 'Active'}}
```

Universal Task Details Fields

Function = List (Get)

Function : List (Get)

Kubernetes Object : Pod

Logging Level : None

Field Label	Description	Example

Kubernetes Object	Type of Kubernetes Object to perform the selected function against: • Pod • Deployment • Namespace	Pod
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

Function = Create

Field Label	Description	Example
Kubernetes Object	Type of Kubernetes Object to perform the selected function against: • Pod • Deployment • Namespace	Pod
Object Name	The Name of the Kubernetes Object (Pod, Deployment, Namespace) to be created	
Namespace	The Namespace of the Kubernetes Object to be created. NOT used if Kubernetes Object = Namespace in this case the Namespace name is specified as the Object Name	default
YAML Definition	UC Data Script containing the Kubernetes Object definition in yaml format	
Logging Level	Controls messages issues from the Universal Task Script: • None • Info • Debug • Warning • Critical	None

Function = Delete

Field Label	Description	Example
Kubernetes Object	Type of Kubernetes Object to perform the selected function against • Pod • Deployment • Namespace	Pod
Object Name	The Name of the Kubernetes Object (Pod, Deployment, Namespace) to be deleted	
Namespace	The Namespace of the Kubernetes Object to be deleted. NOT used if Kubernetes Object = Namespace in this case the Namespace name is specified as the Object Name	default
Logging Level	Controls messages issues from the Universal Task • None • Info • Debug • Warning • Critical	None

Function = Replace

Field Label	Description	Example

Kubernetes Object	Type of Kubernetes Object to perform the selected function against: • Pod • Deployment • Namespace	Pod
Object Name	The Name of the Kubernetes Object (Pod, Deployment, Namespace) to be Replaced	
Namespace	The Namespace of the Kubernetes Object to be replaced. NOT used if Kubernetes Object = Namespace in this case the Namespace name is specified as the Object Name	default
YAML Definition	UC Data Script containing the Kubernetes Object definition in yaml format	
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

UAC - UA Install

- Universal Task to Install Universal Agent via SSH Server; Download Universal Agent Install from Stonebranch Website
- Example Output
- Universal Task Details Fields
  - Function = Download - To Runtime Directory
  - Function = Install - From Runtime Directory

Universal Task to Install Universal Agent via SSH Server; Download Universal Agent Install from Stonebranch Website

Note

Requires an SSH Server running on the target Server where the Universal Agent is to be installed.

The Universal Task automates the following functions:

- Download

This function downloads the Universal Agent installation package for the selected OS platform and version from the downloads.stonebranch.com site to the Runtime directory specified.

- Install

This function performs the following:

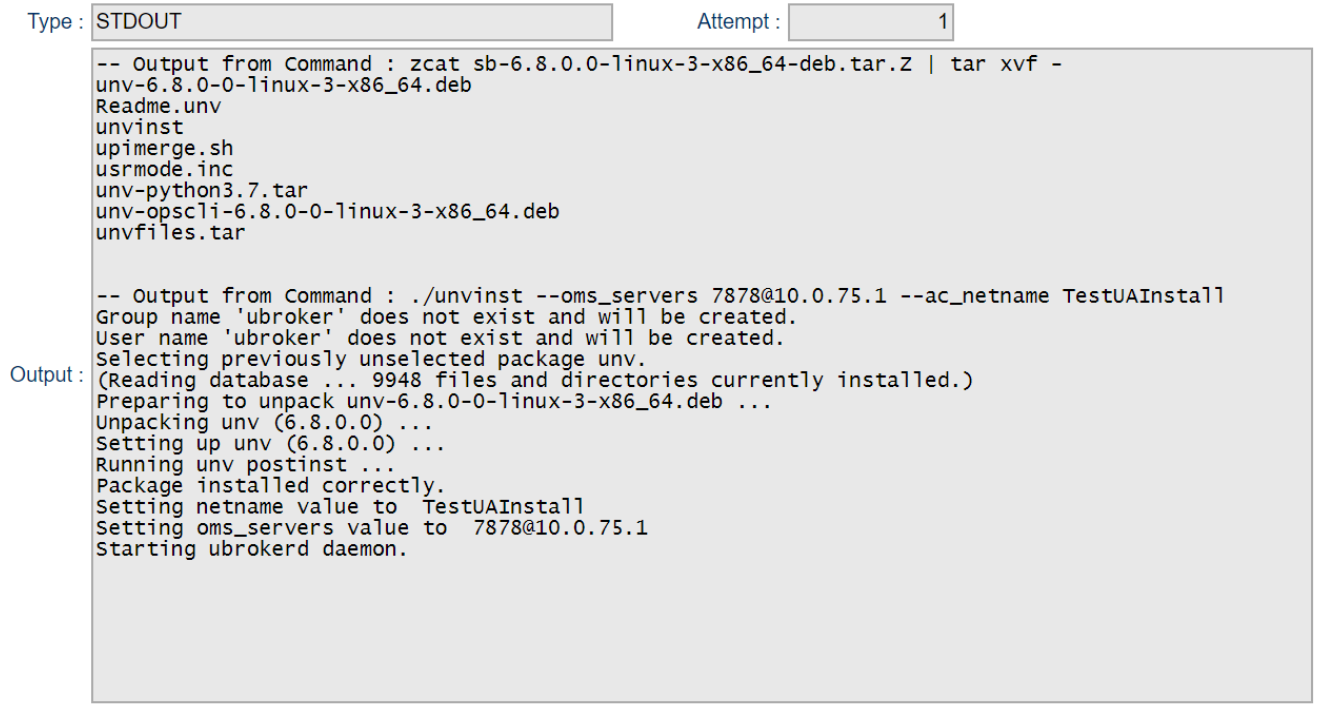
- Uploads a previously downloaded Universal Agent installation package for the selected OS platform and version from the specified Runtime directory to the target installation server.
- Installs the Universal Agent.

Example Output

Type : STDERR Attempt : 1

Output :

```
2020-06-08 12:27:49,556 - INFO     - Connect to Host = sbus08 on Port = 7822
2020-06-08 12:27:49,634 - INFO     - Connected (version 2.0, client OpenSSH_7.6p1)
2020-06-08 12:27:49,681 - INFO     - Authentication (password) successful!
2020-06-08 12:27:49,684 - INFO     - Transfer File = sb-6.8.0.0-linux-3-x86_64-deb.tar.Z
2020-06-08 12:27:49,760 - INFO     - [chan 0] Opened sftp connection (server version 3)
2020-06-08 12:28:00,444 - INFO     - [chan 0] sftp session closed.
2020-06-08 12:28:00,517 - INFO     - Installing from sb-6.8.0.0-linux-3-x86_64-deb.tar.Z with opt
2020-06-08 12:28:00,517 - INFO     - Executing Command zcat sb-6.8.0.0-linux-3-x86_64-deb.tar.Z |
2020-06-08 12:28:04,202 - INFO     - RunCommand Exit status = 0
2020-06-08 12:28:04,202 - INFO     - Executing Command ./unvinst --oms_servers 7878@10.0.75.1 --a
2020-06-08 12:28:06,774 - INFO     - RunCommand Exit status = 0
```



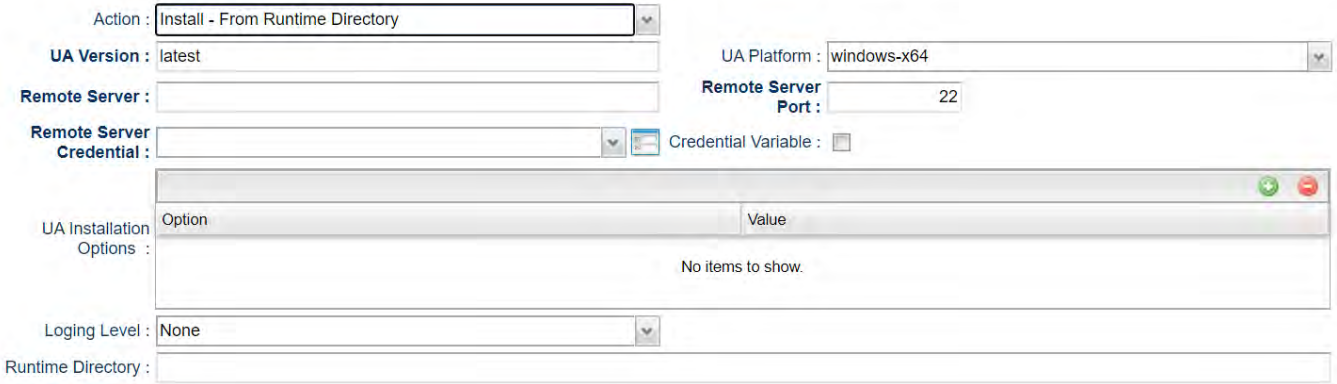
Universal Task Details Fields

Function = Download - To Runtime Directory

Field Label	Description	Example
UA Version	The Universal Agent version number to be downloaded. In the format v.r.m.m or latest.	6.8.0.0

UA Platform	Select the required Universal Agent OS platform from the list.	
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None
Runtime Directory	Specify where the Universal Agent installation package will be downloaded to.	C:\UA\InstallFiles

Function = Install - From Runtime Directory



Field Label	Description	Example
UA Version	The Universal Agent version number to be uploaded and installed. In the format v.r.m.m or latest.	6.8.0.0
UA Platform	Select the required Universal Agent OS platform from the list. Note: This version of the UA Install task only supports the following Linux and Windows operating systems. • windows-x64 • windows-x64-um • linux-3.10-x86_64 • linux-3-x86_64-deb • linux-3.10-ppc64le	
Remote SSH Server	Specify the Hostname for the Remote SSH Server.	mysshserver
Remote SSH Port	Specify the SSH port for the Remote SSH Server.	22

Remote SSH Credential	Select the Credential Definition to access the Remote SSH Server. If the Credential specifies a Key Location, Public Key Authentication will be performed.	
Credential Variable	Check to specify a variable for the Remote SSH Credential .	
UA Installation Options	Specify any desired Installation Options to be passed to the install command. Note: • Options for Linux / Unix are prefixed with -- • Options for Windows are not prefixed • Options for Windows User mode are prefixed with - Refer to the documentation for the relevant installation package for more information:	
Logging Level	Controls messages issues from the Universal Task: • None • Info • Debug • Warning • Critical	None

UAC - Remote Controller

- Run Task or Workflow on a Remote Universal Controller
- Universal Task Field Descriptions
- Command Line Script Parameters

Run Task or Workflow on a Remote Universal Controller

Universal Task to launch, monitor, and return results from a task defined in a remote Universal Controller.

For customers who would like to manage tasks in one Universal Controller from another Universal Controller. Simply supply the target Universal Controller URL, valid credentials, and the name of a task defined to the target Universal Controller. Using the web service API's, the Universal Task launches the requested task by name, captures the new instance sysid, and uses this to track the status of the task. After completion, the output is retrieved if the task type supports this, the Universal Task complete with the same exit code as the launched task.

- Requires Universal Controller version 6.5.0.0 (or higher) on the target Universal Controller, and UC 6.7.0.0 or Higher on the Source Universal Controller.
- Running remote Universal Controller workflows is partially supported with the following limitations:
  - Tasks within the workflow are not individually tracked.
  - No output is returned.
  - Workflow status is returned, however workflows do not set a return code so you will need to define the Universal Task's exit code processing to handle the status returned in the stderr appropriately.
- Both stdout and stderr from the remote task are returned to the Universal Task's stdout. Stderr is used for messages from the Universal Task itself.
- Requires Python 3.6 or higher with the requests module installed. Tested with the Universal Agent bundled Python distribution.
- You can set different log-levels for the Universal task, providing you more or less information to suit your needs.
- We are also delivering a Python script for customers who would like to run Universal Controller tasks externally from a command line or other Job Scheduling tool.
  - Example command line:

python run_universal_controller_task.py --controllerurl https://localhost:8080/opswise --username controlleruser --password controlleruserpassword --task "sleep 0" --loglevel info

  - Example stderr messages:

2018-08-07 09:33:08,976 - INFO - Launching Task : Sleep 0

2018-08-07 09:33:09,049 - INFO - Task Instance Sysid : 1533578492639002557VEO7SQNCIHTCF

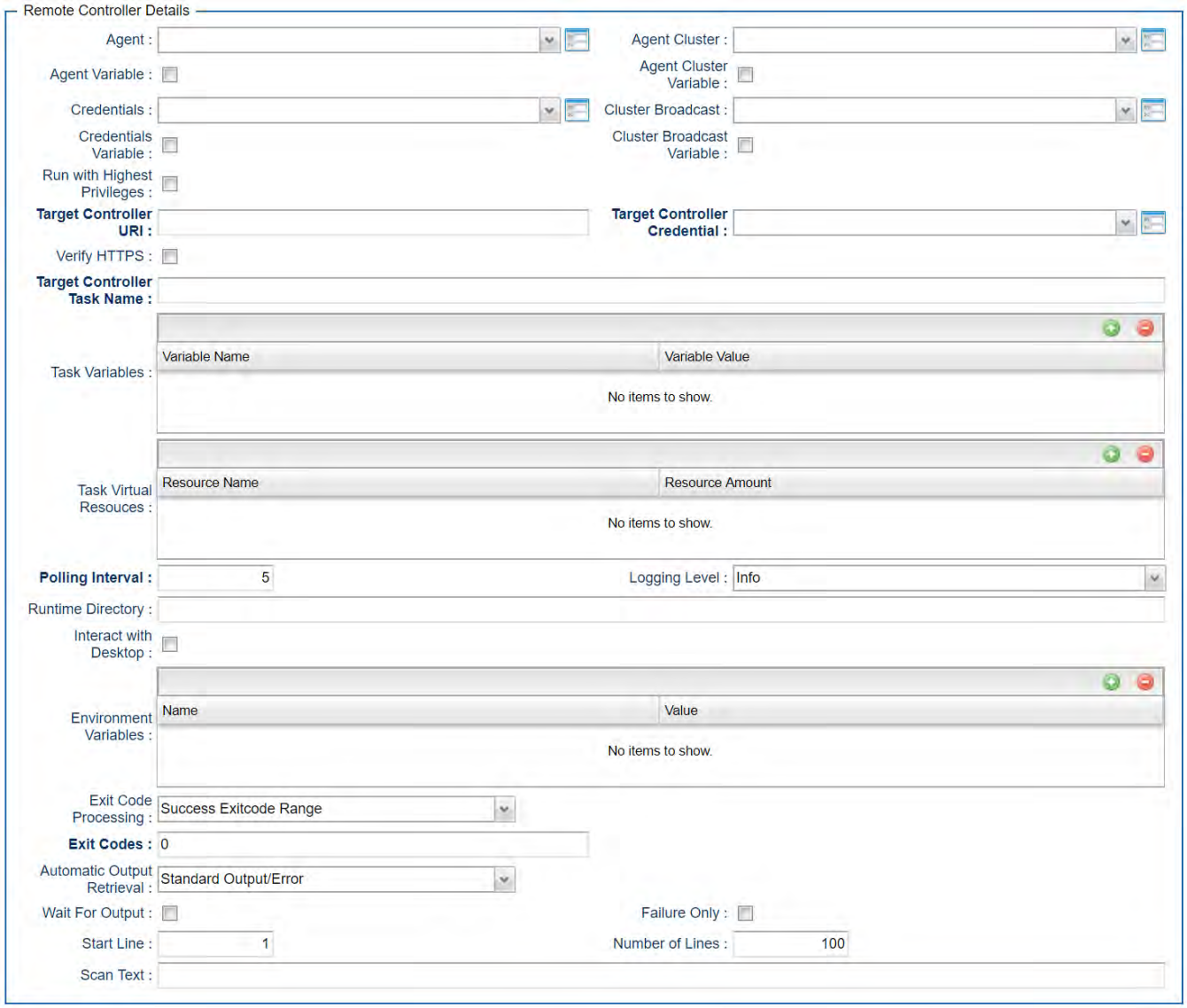
2018-08-07 09:33:09,049 - INFO - Monitoring Task : Sleep 0

2018-08-07 09:33:15,087 - INFO - Task Complete : Status = SUCCESS, Exit Code = 0

2018-08-07 09:33:40,530 - INFO - Retrieving Available Output : Sleep 0

2018-08-07 09:33:40,539 - INFO - Output Retrieval Not Valid for Task Type : Timer

Universal Task Field Descriptions



Field Label	Description	Example	Required
Target Controller URL	Specify the URL for the Target Universal Controller. This specifies where the Task will be Launched.	https://localhost:8080/opswise	Y

Target Controller Credential	Select the Credential Definition to access the Target Universal Controller		Y
Verify HTTPS	For https connections, the Universal Task supports host validation with a certificate or CA certificate, check this option to provide the location of the certificate or CA certificate. If unchecked no host certificate validation will be performed.		N
Certificate File Location	Select on of the following: • Utility Agent Path : If the certificate or CA certificate is located on the Utility Agent File System. • Script File : if the certificate or CA certificate is stored as a Script Data object on the Source Universal Controller		Y (if Verify HTTPS is True)
Certificate File	Specify the location of the certificate or CA certificate on the Utility Agent file system.	/etc/certs/ca-cert.cer C:\security\certs\ca-cert.cer	Y (if Certificate File Location is Utility Agent Path)
Certificate File	Select the Script Data object that contains the certificate or CA certificate.		Y (if Certificate File Location is Script Data)
Target Controller Task Name	Specify the Task to Launch on the Target Universal Controller. The Task name specified must exist of the Target Universal Controller.	Sleep 0	Y
Task Variables	Specify any Variables to pass to the task.		N
Task Virtual Resources	Specify any Virtual Resources and the Amount that the Task will consume.		N
Polling Interval	Provide the polling interval in seconds for checking the Task's status. Default is 5 seconds.		Y
Logging Level	Select the level of messages returned from the script. Valid options are: • None • Info • Debug • Warning • Error • Critical		N

Command Line Script Parameters

Option	Description	Example	Required
--controllerurl	Specify the URL for the Target Universal Controller. This specifies where the Task will be Launched.	--controllerurl https://localhost:8080/opswise	Y
--username	Specify the user to access the Remote Universal Controller	--username ops.admin	Y
--password	Specify the password for the user specified via --username	--password secret	Y

--verfiy	For https connections, the Universal Task supports host validation with a certificate or CA certificate. To Bypass host validation specify False. If not specified host validation will be performed.	--verify False	N
--certfile	Specify the location of the certificate or CA certificate	--certfile /etc/certs/uc-ca.cer	N
--taskname	Specify the Task to Launch on the Target Universal Controller. The Task name specified must exist of the Target Universal Controller.	--taskname "Sleep 0"	Y
--vararray		--vararray '{"var1":"value1","var2":" value2"}'	N
--resarray		--resarray '{"Resource1":"1"," Resource2":"6"}'	N
--interval	Provide the polling interval in seconds for checking the Task's status.	--interval 30	Y
--loglevel	Specify the level of messages returned from the script. Valid options are: • None • Info • Debug • Warning • Error • Critical	--loglevel info	N

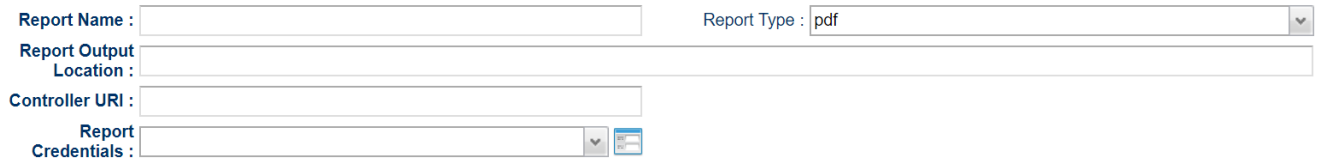
UAC - UC Report

- Run Universal Controller Report and Deliver Output to a Specified Server and File Location
- Universal Task Details Fields

Run Universal Controller Report and Deliver Output to a Specified Server and File Location

Universal Task to execute a Universal Controller report and write the output file to the specified location on Agent Server

Universal Task Details Fields



Field Label	Description	Example
Report Name	The Name of the Universal Controller Report to Run	UAC - Audit Failed Logins
Report Type	Type of the Report File that will be created: • pdf • png • csv • tab • xml	
Report Output Location	Fully qualified File Name where the report will be written	c:\temp\myreport.pdf
Controller URI	URL of the Universal Controller	https://localhost:8443/uc
Report Credentials	Credential that will run the report	

Downloadable Universal Templates

Available Downloadable Universal Templates

The following tabled identifies the Downloadable Universal Templates that are available for Universal Controller release 7.0.0.0.

The Name of each Universal Template is a link to a separate page containing detailed information about that template.

(For additional information about Universal Templates, see Universal Templates.)

Name	Description	Available from Release
Ansible Integration	Manage Ansible task execution through the Universal Controller user interface.	UC 6.8.0.0 and later
AWS Create EC2 Instance (with Universal Agent)	Create an EC2 instance with parameters, either in task form, or by simply creating an EC2 instance from the existing AWS launch template.	UC 6.8.0.0 and later
AWS EC2 - Start, Stop, Terminate, and Manage Universal Task Instances	Start, stop, terminate, and manage AWS EC2 instances on demand, simply by providing one or more instance IDs as input.	UC 6.8.0.0 and later
AWS S3	Securely transfers files from, to and between AWS S3 cloud storage buckets and folders.	UC 6.8.0.0 and later
AWS SQS	Create, send and monitor AWS SQS messages and automatically trigger a task in Universal Controller once a message has been received.	UC 6.8.0.0 and later
Azure Blob Storage	Securely transfers files from, to and between Azure Blob Storage container and folders.	UC 7.0.0.0 and later
Azure Data Factory Integration	Schedule, trigger, and monitor the Azure Data Factory pipeline process directly from Universal Controller.	UC 6.8.0.0 and later
Azure Logic Apps	Trigger and monitor the execution of Azure Logic workflows and retrieve the execution of Azure Logic workflow output.	UC 6.8.0.0 and later
Azure Virtual Machines Start-Stop-Terminate-Instance	Utilize Azure Virtual Machine (VM) name, resource group, subscription ID, and access token as inputs for the start, stop, terminate, list, and check status of Azure VMs.	UC 6.8.0.0 and later
Container File Monitoring	Dynamic File Monitoring and File Transfer solution for containerized applications running in any container management solution.	UC 7.0.0.0 and later
Databricks	Perform end-to-end Orchestration and Automation of Jobs & Clusters in Databricks environment, either in AWS or Azure.	UC 6.8.0.0 and later
GitHub	Perform server operations, such as importing/exporting Universal Automation Center objects and integrating with GitHub, as well as allowing the import/export of Universal Automation Center objects using the Universal Controller script library.	UC 6.8.0.0 and later
Google BigQuery	Schedule, trigger, monitor, and orchestrate the Google BigQuery process directly from Universal Controller.	UC 6.8.0.0 and later

Informatica Cloud	Schedule any Data Integration Task or Linear Taskflow in the Informatica Cloud.	UC 6.8.0.0 and later
Informatica PowerCenter	Schedule Informatica PowerCenter Workflows and Tasks, including retrieval of the workflow and session log.	UC 6.8.0.0 and later
Jenkins Integration	Improves the functionality of Jenkins when orchestrated from Universal Controller.	UC 6.8.0.0 and later
JSCAPE MFT	Manage and integrate JSCAPE Managed File Transfer Server processes within UAC automation processes and workflows.	UC 7.0.0.0 and later
Microsoft Teams Integration	Send messages to an existing channel of Microsoft Teams, allowing you to integrate this solution in UAC to notify users for UAC result or send approval notifications on Microsoft teams.	UC 6.8.0.0 and later
PagerDuty	Notify PagerDuty (Incident management platform) in the event of job Failure or long run of a job or early finish of a job or any other event in Universal Controller.	UC 6.8.0.0 and later
Salesforce	Create contact and lead objects in Salesforce, as well as execute Salesforce Object Query Language (SOQL) queries.	UC 6.8.0.0 and later
SAP Calendar Import	Import the SAP Factory Calendar and the related Holiday Calendar into the Universal Controller.	UC 6.8.0.0 and later
SAP Extract Job Definitions	Export SAP Job definitions from SAP into one flat file for each Job selected for extraction.	UC 6.8.0.0 and later
ServiceNow Integration	Create incident tickets, problem tickets, and change requests in ServiceNow straight from the Universal Controller.	UC 6.8.0.0 and later
Slack Notifications	Sends job status notifications to a Slack channel and enables users to send interactive messages in Slack for Universal Controller manual task approvals.	UC 6.8.0.0 and later
Snowflake	Orchestrate, schedule, trigger, and monitor the Snowflake load and unload process from different data sources (cloud storage or local VM's) directly from Universal Controller.	UC 6.8.0.0 and later
SQL	Execute SQL scripts and functions against a MySQL, PostgreSQL, Microsoft SQL Server, Oracle, and SAP HANA database.	UC 6.8.0.0 and later
UiPath for UAC Integration	Schedule, trigger, and monitor the UiPath (RPA) process directly from the Universal Controller.	UC 6.8.0.0 and later

Ansible Integration

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Disclaimer

This download is designed as a template to be adapted to your environment. In some cases, templates will need to be changed to work with your current Universal Automation Center (UAC) setup. This download is free to use. However, the download is not supported, and no warranty is provided by Stonebranch for this document and the related download. The use of this document and the related download is at your own risk. Before using this download in a production system, please perform testing.

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Stonebranch offers paid support, by request, for select Universal Tasks. Paid support provides installation and on-going technical support. Universal Tasks that are eligible for paid support will be noted as “support eligible” within the Universal Task listing page. To learn more, please contact Stonebranch.

Introduction

Ansible is an opensource tool that is used primarily for:

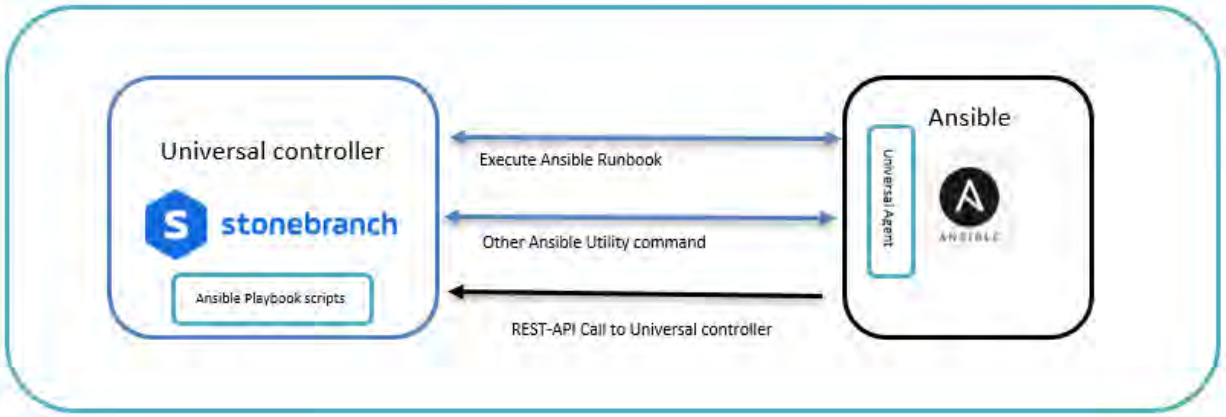
- Application deployment
- Updates on workstations and servers
- Cloud provisioning
- Configuration management
- Intra-service orchestration.

Ansible does not depend on agent software and has no additional security infrastructure.

Universal Controller can be integrated easily with Ansible through a Linux/Unix Universal Agent, as Ansible software can only be installed in Unix/Linux machines. So Universal Controller can manage all Ansible task execution through an intuitive user interface controlling Ansible playbook execution/host inventory details / other Ansible utility.

Overview

- Manage Ansible task execution through the intuitive Universal Controller user interface.
- Ansible playbooks can either be centrally stored and maintained in the Universal Controller script library, or Universal Controller can call the relevant playbook that is residing in Ansible host.
- This Universal Task also enables the execution of other Ansible commands.



Software Requirements

Linux Universal Agent installed in an Ansible host.

Software Requirements for Universal Template and Universal Task

This integration requires an Universal Agent installed in an Ansible server where there is access to use Ansible CLI.

Software Requirements for Universal Agent

- Universal Agent for Linux Version 6.5.0.0 and later.

Software Requirements for Universal Controller

- Universal Controller Version 6.5.0.0 and later.

Software Requirements for the Application to be Scheduled

This Universal Task can work with any of the Ansible Version (tested with 2.8.0).

Technical Considerations

- Accepts input parameters like Ansible utility, Ansible playbook path, Ansible host inventory, Script library (Yaml)
- Universal agent should be installed in the Ansible hosted machine and register to a Universal Controller.
- The Universal Task supports only Universal Agent for Linux.

Ansible Integration Key Features

Feature	Description
Ansible Playbook	This feature help to execute a Ansible playbook that resides in the remote ansible host.
Other Ansible Utility commands	This may be used other Ansible CLI commands.

Import Ansible Integration Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Ansible Integration Universal Task

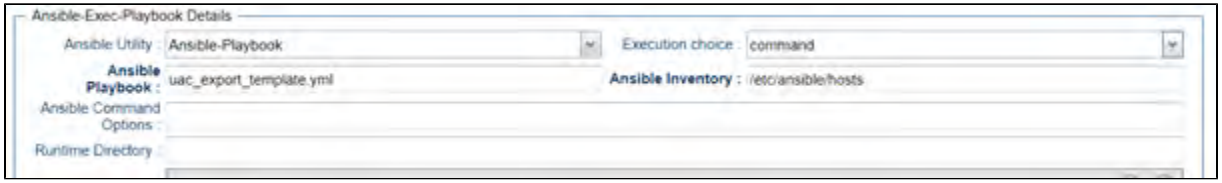
For this Universal Task type, create a new task and enter the task-specific details that were created in the Universal Template.

Field Descriptions for Ansible Integration Universal Task

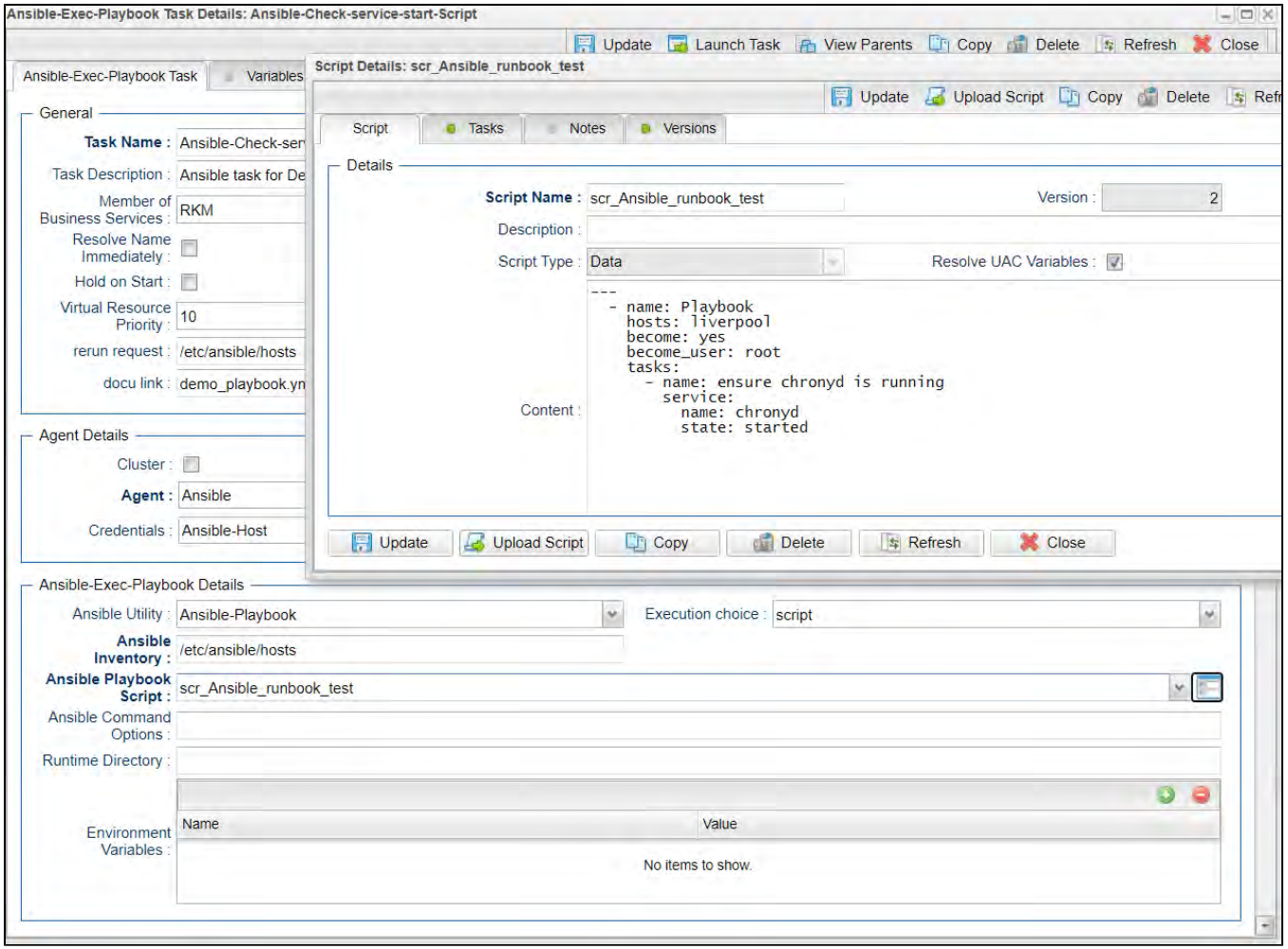
Field	Description
Ansible utility	1. Ansible-Playbook (select to execute Ansible playbook) 2. Other-Ansible-Utility (Other Ansible commands)
Execution Choice	• Command: provide Ansible command that will be used to execute in Ansible machine where playbook and inventory is stored in Ansible host. • Script: Select this option if you want to store the Ansible playbook in controller script library.
Ansible Inventory	Provide the Ansible Inventory source from the Ansible host.
Ansible Playbook Script	Provide a Uiversal Controller script name where you have the Ansible playbook (YAML).
Ansible command options	Any additional commands if needed in playbook execution.

Examples for Ansible Integration Universal Tasks

Invoke an Ansible Playbook that Resides in a Remote Ansible Server



Creating and Executing an Ansible Playbook from Controller



Document References

This document references the following documents:

Name	Location	Description

Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

AWS Create EC2 Instance (with Universal Agent)

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- Configure AWS Create EC2 Instance (with Universal Agent) Universal Task
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- Examples for AWS Create EC2 Instance (with Universal Agent) Universal Tasks
  - New EC2 Instance Creation
  - Launch Instance with Launch Template
- Document References

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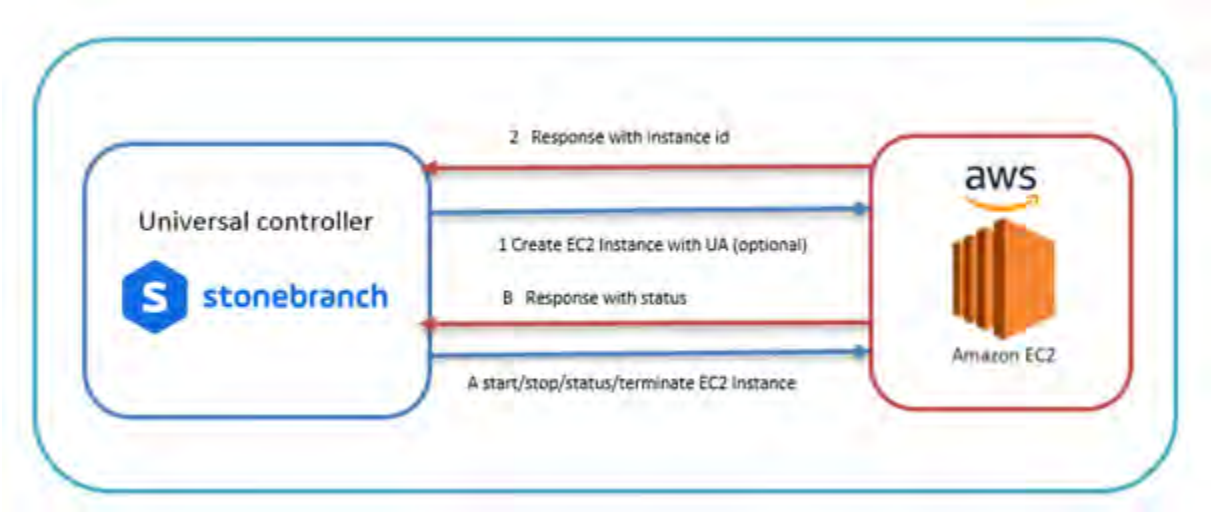
Introduction

This Universal Task allows customers to create an EC2 instance with parameters, either in task form, or by simply creating an EC2 instance from the existing AWS launch template. This task also offers the option to additionally install a Linux/UNIX Universal Agent in the newly provisioned EC2 Instance.

Overview

- The task interacts with the AWS platform via a Python boto3 module.
- All AWS credentials remain encrypted.
- Customers can also install/configure a Linux Universal Agent for each EC2 instance, enabling the Universal Controller to instantly communicate with the newly created instance. (NOTE: only Linux Universal Agent is supported at the moment.)
- This task also lets customers create multiple EC2 instances with the same configuration. New instances can also be tagged.
- It allows customers to create a new keypair or use an existing one for the new EC2 instance.
- This task also enables options for additional EBS volume and encryption, as well as detailed monitoring.

AWS EC2 Task High-Level Overview



Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against AWS EC2 Instance.

Software Requirements for Universal Template and Universal Task

- Requires Python 2.7 or Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests
    - Boto3

Software Requirements for Universal Agent

- Universal Agent for Windows x64 Version 6.6.0.0 and later with python options installed
- Universal Agent for Linux Version 6.6.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.7.0.0 and later

Software Requirements for the Application to be Scheduled

- The Server Running the Universal Agent needs to have Python 2.7.x or 3.6.x installed
- AWS IAM Credentials -Access Key, Secret Access key and Region with EC2 set of permissions

- This universal task for the AWS EC2-start-stop-terminate has been tested with the agent bundled with python 3.6 and boto3 module

Technical Considerations

- Consider using this universal task either with universal agent bundled with python(uapy) and also having boto3 module within this environment or a python environment (py) in a host where universal agent is installed with boto3 module in it.
- AWS IAM credentials (Access Key, Secret Access key and Region) should be with the Appropriate access for handling AWS EC2 instances.
- With the current version of this Universal Task, Universal Agent can be installed only in Linux EC2 Instance.

AWS Create EC2 Instance (with Universal Agent) Key Features

Feature	Description
Create New EC2 Instance	Creates a EC2 Instance based on the parameters that are provided in the form
Launch EC2 from template	Create a EC2 Instance based on a template in AWS

Import AWS Create EC2 Instance (with Universal Agent) Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure AWS Create EC2 Instance (with Universal Agent) Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

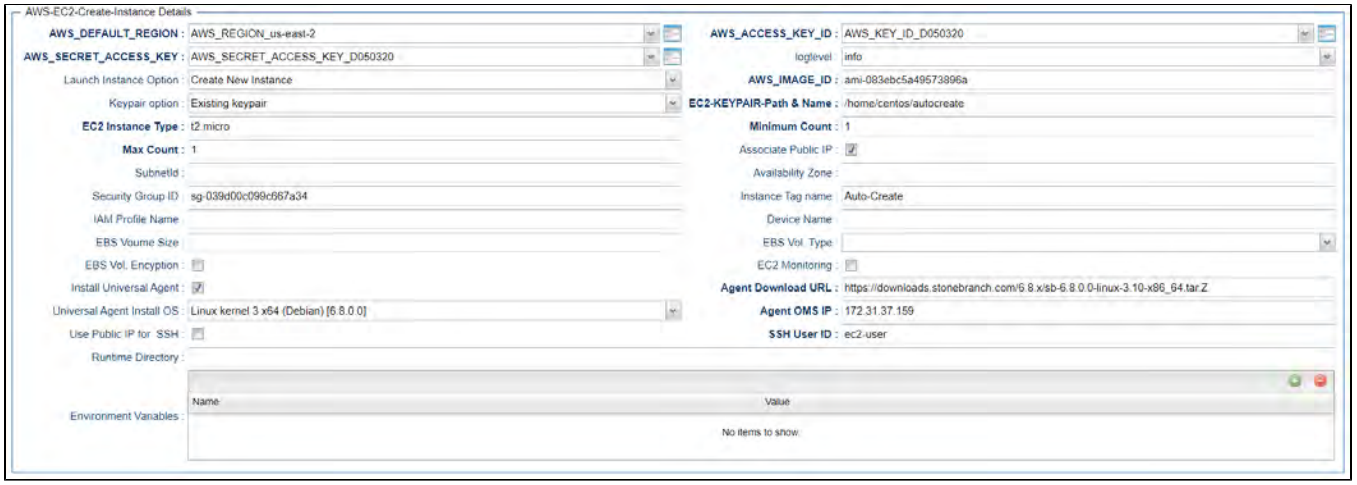
Field Descriptions for AWS Create EC2 Instance (with Universal Agent) Universal Task

Field	Description
AWS-DEFAULT-REGION	AWS Region kept as credential
AWS-SECRET-ACCESS-KEY	AWS Secret Key
AWS-ACCESS-KEY-ID	AWS Access Key
Launch Instance Option	Select either launch from template or create a brand new ec2 instance with the parameter supplied in the form
LaunchTemplateName	Mandatory if launch_instance_option=” Launch from template”
AWS_IMAGE_ID	Provide the AWS machine ID ,Mandatory if launch_instance_option=” new_instance”

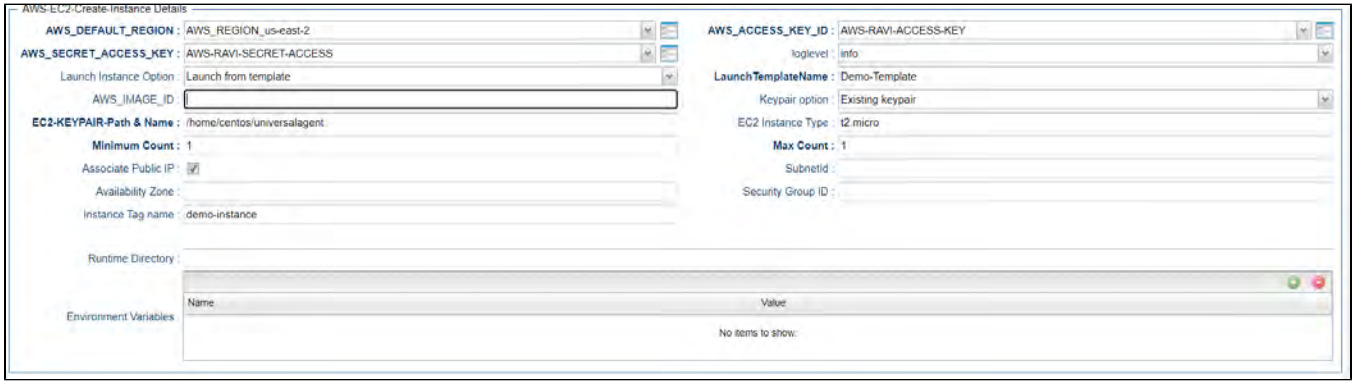
Keypair option	PEM file creation choice , Select either existing Key pair or New Key pair
EC2-KEYPAIR-Path & Name	Provide Keypair file name and the path (Do not give the extension) for new and for existing keypair just the name
EC2 Instance Type	provide ec2-instance type like t2. Micro , if Launch from template = “Create New Instance”
Minimum Count	Minimum Count of instance that need to be created, if Launch from template = “Create New Instance”
Max Count	Max count of instance that needs to be created, if Launch from template = “Create New Instance”
associate_public_ip	If a public IP needs to be created when a instance is created
SubnetId	Provide subnetID where the instance to be associated within AWS
Availability Zone	Provide Availability Zone where the instance to be associated within AWS
Security Group ID	provide security group ids, if multiple ID's then separate by comma
Instance Tag name	EC2 Instance Tag Name
iam_instance_profile_name	If applicable provide the IAM Instance Profile Name
device_name	Provide the device name; for example, /dev/sda1
ebs_volume_size	Provide EBS Volume size
EBS Vol. Type	Select either standard or io1 or gp2 or sc1 or st1
EBS Vol. Encyption	Check if encryption needs needed
EC2 Monitoring	Check this box if detailed monitoring required
Install Universal Agent	Check this box if you would need to install universal agent with this new EC2 instance created
Agent Download URL	Provide the path to download the agent URL, if install universal agent option is selected
Universal Agent Install OS	select the OS where universal agent needs to be installed
Agent OMS IP	Provide the OMS server IP for the universal agent to be connected after installation , if install universal agent option is selected
Use Public IP for SSH	Select if you would need to use the public or provide IP for SSH
os_user_id	Provide the OS user ID that will be used to make SSH connection

Examples for AWS Create EC2 Instance (with Universal Agent) Universal Tasks

New EC2 Instance Creation



Launch Instance with Launch Template



Document References

This document references the following documents:

Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

AWS EC2 - Start, Stop, Terminate, and Manage Universal Task Instances

- Disclaimer
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- Software Requirements
    - Software Requirements for Universal Template and Universal Task
    - Software Requirements for Universal Agent
    - Software Requirements for Universal Controller
    - Software Requirements for the Application to be Scheduled
- Technical Considerations
- Start, Stop, Terminate, and Manage AWS EC2 Instance Key Features
- Import Start, Stop, Terminate, and Manage AWS EC2 Built-In Universal Template
- Configure Start, Stop, Terminate, and Manage AWS EC2 Instance Universal Task
- Field Descriptions for Start, Stop, Terminate, and Manage AWS EC2 Instance Universal Task
- Examples for Start, Stop, Terminate, and Manage AWS EC2 Instance Universal Tasks
    - Start EC2 Instances
- Document References

Disclaimer

This download is designed as a template to be adapted to your environment. In some cases, templates will need to be changed to work with your current Universal Automation Center (UAC) setup. This download is free to use. However, the download is not supported, and no warranty is provided by Stonebranch for this document and the related download. The use of this document and the related download is at your own risk. Before using this download in a production system, please perform testing.

Stonebranch assumes no liability for any issues caused by the performance of this download.

Request Support:

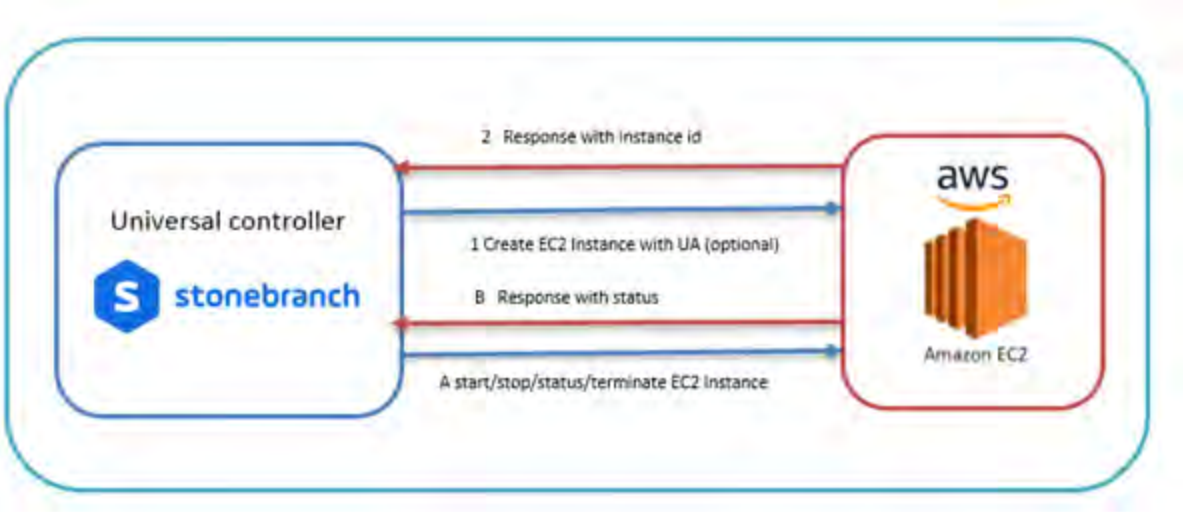
Stonebranch offers paid support, by request, for select Universal Tasks. Paid support provides installation and on-going technical support. Universal Tasks that are eligible for paid support will be noted as “support eligible” within the Universal Task listing page. To learn more, please contact Stonebranch.

Introduction

This Universal Task allows users to start, stop, terminate, and manage AWS EC2 instances on demand, simply by providing one or more instance IDs as input.

Overview

- This task uses python boto3 to interact with the AWS platform using the credentials supplied within the task.
- It supports multiple EC2 instances at once.
- In Universal Controller this task goes to the success state until the EC2 instance is completely spun up or terminated.
- Scheduling this task using Universal Controller workflow spins up and tears down EC2 instances based on the business needs, complete with correct set up and dependencies.
- It dynamically manages EC2 operations, offering the potential to reduce EC2 operations costs in the cloud.



Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against AWS EC2 Instance.

Software Requirements for Universal Template and Universal Task

- Requires Python 2.7 or Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests
    - Boto3

Software Requirements for Universal Agent

- Universal Agent for Windows x64 Version 6.6.0.0 and later with python options installed
- Universal Agent for Linux Version 6.6.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.7.0.0 and later

Software Requirements for the Application to be Scheduled

- The Server Running the Universal Agent needs to have Python 2.7.x or 3.6.x installed
- AWS programmatic Credentials -Access Key, Secret Access key and Region
- This Universal Task for the AWS EC2-start-stop-terminate has been tested with the agent bundled with python 3.6 and boto3 module

Technical Considerations

- Consider using this Universal Task either with universal agent bundled with python(uapy) and also having boto3 module within this environment or a python environment (py) in a host where Universal Agent is installed with boto3 module in it.
- AWS IAM credentials (Access Key, Secret Access key and Region) should be with the appropriate access for handling AWS EC2 instances

Start, Stop, Terminate, and Manage AWS EC2 Instance Key Features

Feature	Description
Start EC2 Instance	Start one or Multiple EC2 instance
Stop EC2 Instance	Stops one or Multiple EC2 instance
Terminate EC2 Instance	Terminate one or Multiple EC2 instance
EC2 status	Provides one or Multiple EC2 instance status

Import Start, Stop, Terminate, and Manage AWS EC2 Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Start, Stop, Terminate, and Manage AWS EC2 Instance Universal Task

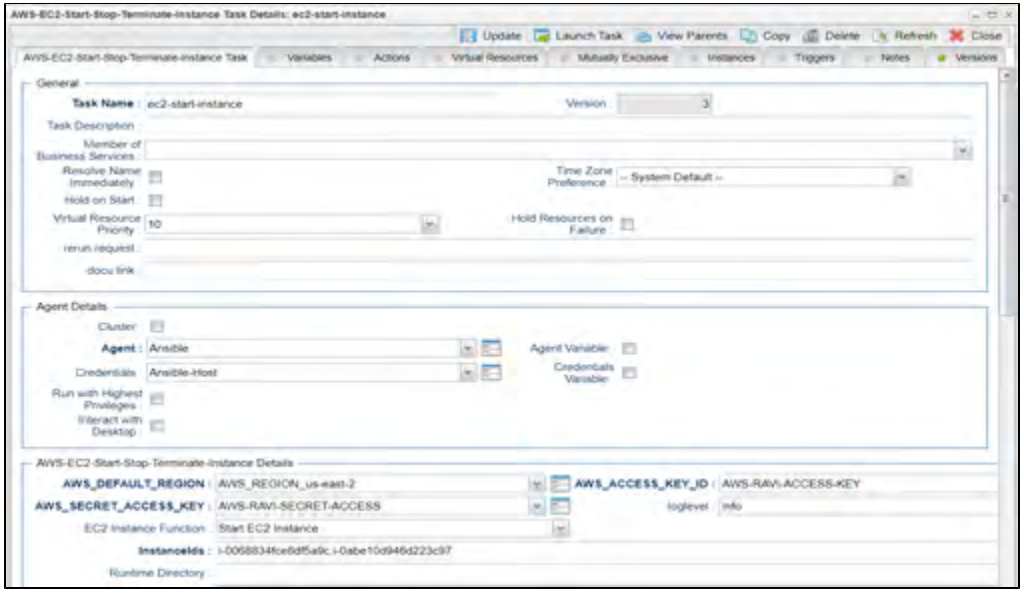
For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

Field Descriptions for Start, Stop, Terminate, and Manage AWS EC2 Instance Universal Task

Field	Description
AWS-DEFAULT-REGION	AWS Region kept as credential
AWS-SECRET-ACCESS-KEY	AWS Secret Key
AWS-ACCESS-KEY-ID	AWS Access Key
EC2 Instance Function	Select either start or stop or terminate or check ec2 instance
Instance ID’s	Provide the Instance ID which you would need to start or stop or term

Examples for Start, Stop, Terminate, and Manage AWS EC2 Instance Universal Tasks

Start EC2 Instances



Document References

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AWS S3

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  - Software Requirements Universal Controller
  - Software Requirements for the Application to be scheduled
- Universal Task for AWS S3 Key Features
- Import AWS S3 Built-In Universal Template
- Configure AWS S3 Universal Tasks
- Field Descriptions for AWS S3 Universal Task - Action
  - Create Bucket - Action
  - Example for AWS S3 Universal Tasks - Create Bucket
  - List Buckets - Action
  - Example for AWS S3 Universal Tasks - List Buckets
  - Upload File - Action
  - Example for AWS S3 Universal Tasks - Upload File
  - List Objects - Action
  - Example for AWS S3 Universal Tasks - List Objects
  - Download File - Action
  - Example for AWS S3 Universal Tasks - Download File
  - Delete Objects - Action
  - Example for AWS S3 Universal Tasks - Delete Objects
  - Copy Object to Bucket - Action
  - Example for AWS S3 Universal Tasks - Copy Object to Bucket
  - Delete Bucket - Action
  - Example for AWS S3 Universal Tasks - Delete Bucket
  - Monitor Key - Action
  - Example for AWS S3 Universal Tasks - Monitor Key

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Introduction

Storing data in the cloud becomes an integral part of most modern IT landscapes. With Universal Automation Center you can securely automate your AWS, Azure, Google and MinIO File Transfers and integrate them into your existing scheduling flows.

As security is one of the key concerns when moving to the cloud, the provided solution supports multi-level of security:

- Credentials for AWS S3 (Access Key, Secret Access key and Region) are stored in an encrypted form in the database
- IAM Role-Based Access Control (RBAC) is supported
- Communication to AWS is done via the HTTPS protocol
- A Proxy Server connection to AWS with basic authentication is supported
- Secure access to AWS S3 buckets using AWS bucket policies can be configured in the AWS console
- Restrict sending files only to specific buckets using AWS End Points can be configured in the AWS console

This Universal Task focuses on the AMAZON AWS S3 file transfer, including support for MinIO. MinIO is an Open Source object storage server for private cloud environments based on Amazon's S3 API. All file transfer scenarios supported for AMAZON AWS S3 are also support for MinIO. The scenarios described in this documentation are also valid for MinIO.

A similar solution as for AWS S3 is also available for Microsoft Azure Blob Storage and Google Cloud Storage.

Overview

The Universal Task for AWS S3 allows to securely transfers files from, to and between AWS S3 cloud storage buckets and folders.

The Universal Task for AWS S3 support the following main features:

- The following file transfer commands are supported:
    - Upload a file(s) to an S3 bucket
    - Download of file(s) from an S3 bucket
    - Transfer files between S3 buckets
    - List objects in an S3 bucket
    - Delete object(s) in an S3 bucket
    - List S3 bucket names
    - Create an S3 bucket
- Monitor for a key(s) in a bucket.
- File Transfer can be trigger by a third-party application using the Universal Automation Center RESTfull Webservice API: REST API.
- Universal Task for AWS S3 can be integrated into any existing scheduling workflow in the same way as any standard Linux or Windows Task type.
- Security is ensured by using the HTTPS protocol with support for an optional Proxy Server.
- AWS IAM Role Based Access (RBCA) is supported.
- No Universal Agent needs to be installed on the AWS Cloud – the communication goes via HTTPS.

Software Requirements

Software Requirements Universal Agents and Universal Controller

- Universal Agent for Linux or Windows Version 6.9.0.0 or later are required
- The Universal Agent needs to be installed with python option (--python yes)

Software Requirements Universal Controller

- Universal Controller 6.9.0.0. or later is required

Software Requirements for the Application to be scheduled

The Universal Task has been tested for the AWS S3 SDK for python (boto3) V1.15.6

Universal Task for AWS S3 Key Features

The solution supports the following file transfer scenarios:

Name	Description

Upload a file(s) to a bucket (Copy or Move)	• A single or multiple files can be uploaded to a bucket.
	• Move or copy are supported for the upload
	• Unix filename pattern matching support e.g. wild card support “*” to upload multiple files
	• A single or multiple files can be Uploaded to a folder using a prefix
	• It can be decided via an the *Upload Write Options*:
	  ◦ to overwrite an existing object (*Replace existing Object*)
	  ◦ to cancel the operations in case an object with a similar name exists (*Do not overwrite existing Object*)
	  ◦ to add a timestamp to the uploaded Object (*Timestamp*)

Download of file(s) from a bucket (Copy or Move)	• A single or multiple files should be downloaded from a bucket.
	• Move or copy must be supported for the download
	• Unix filename pattern matching support e.g. wild card support “*” to download multiple files
	• Download to a specific folder is supported
	• It can be decided via an the *Download Write Options*:
	  ◦ to overwrite an existing file (*Replace existing File*)
	  ◦ to cancel the operations in case a File with a similar name exists (*Do not overwrite existing File*)
	  ◦ to add a timestamp to the uploaded file (*Timestamp*)
	  ◦ to perform the default Windows behaviour for copying files (*Default Windows behaviour*)
	  ▪ If a file with a similar name exists, the file names that are similar will be edited so that the files you copied have a number appended at the end of them. For example, if you’re copying a file named image.png to a folder that already has a file named image.png in it, the copied file will be named image (1).png.

Copy object to a bucket	• An object can be copied from one AWS S3 bucket to another. • Folders are support
List objects in a bucket	• Show all Objects in a bucket • Show all Objects in a folder • Unix filename pattern matching support e.g. wild card support “*” to narrow down the objects to display
Delete object(s) in a bucket	• Delete one or multiple objects in a bucket • Delete one or multiple objects in folder in a bucket • Unix filename pattern matching support e.g. wild card support “*” to narrow down the objects to be deleted
List buckets	List all bucket in an AWS S3 account

Create an S3 bucket	Create a new S3 bucket
Delete an S3 bucket	Delete an S3 bucket
Monitor Key	Monitor if a certain key(s) exists in an S3 bucket. Unix filename pattern matching support; for example, wild card support “*” to narrow down the keys to be monitored.
Proxy Server Connection	A proxy server connection with or without basic authentication can be configured
Integration into 3rd Party Applications	An AWS S3 file transfer can be triggered via the Universal Automation Center RESTfull Webservice API within an application.
Self-Service through Web-Client	The S3 Task can be fully configured, monitored and updated via the Universal Controller Web-GUI

Import AWS S3 Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure AWS S3 Universal Tasks

For the new Universal Task type, create a new task and enter the task-specific Details that were created in the Universal Template.

Field Descriptions for AWS S3 Universal Task - Action

The AWS S3 Task provides multiple different file transfer actions. For each action the specific fields are described.

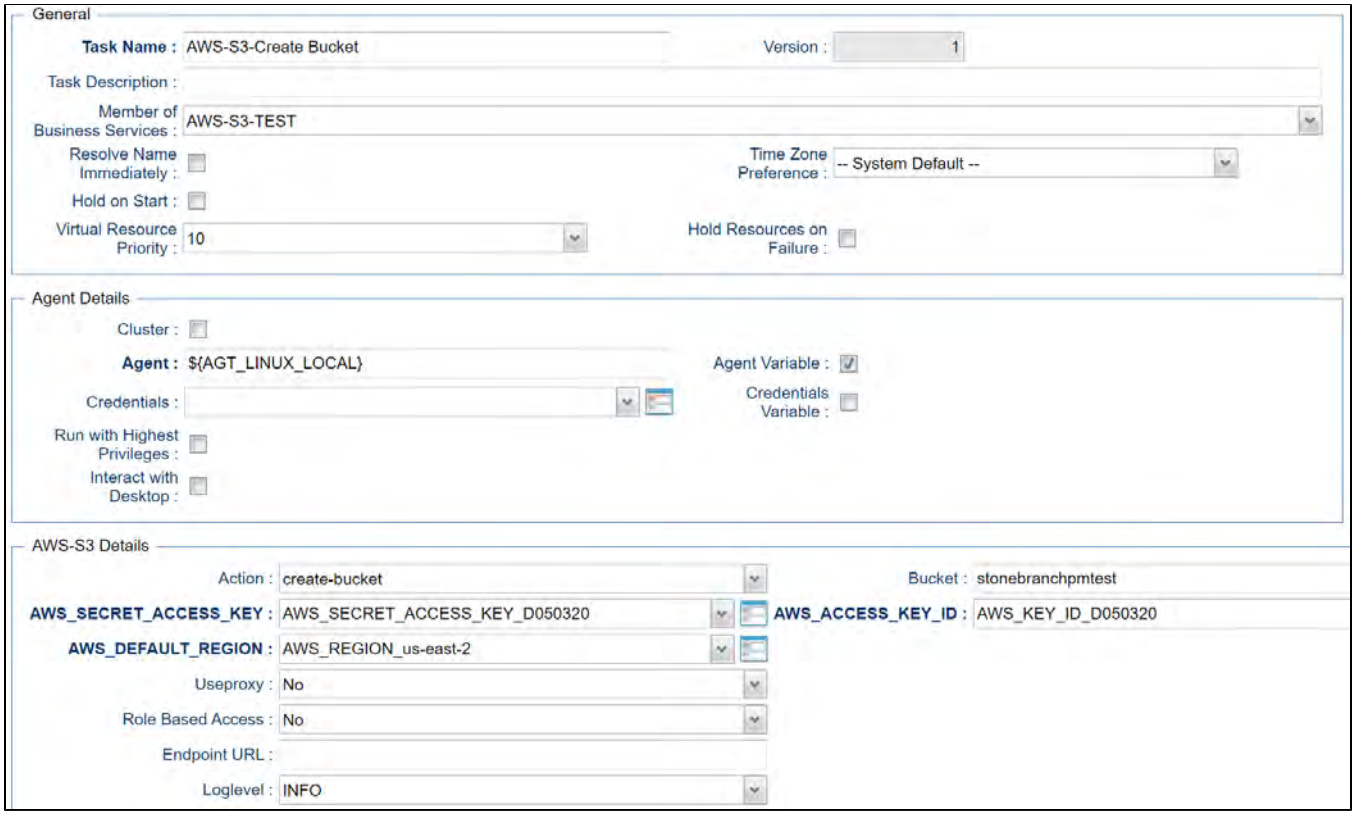
Create Bucket - Action

The Action Creates a new S3 bucket.

Field	Description
Action	create-bucket action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES]

	If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection; for example, rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system
Bucket	Name of the AWS Bucket to create

Example for AWS S3 Universal Tasks - Create Bucket



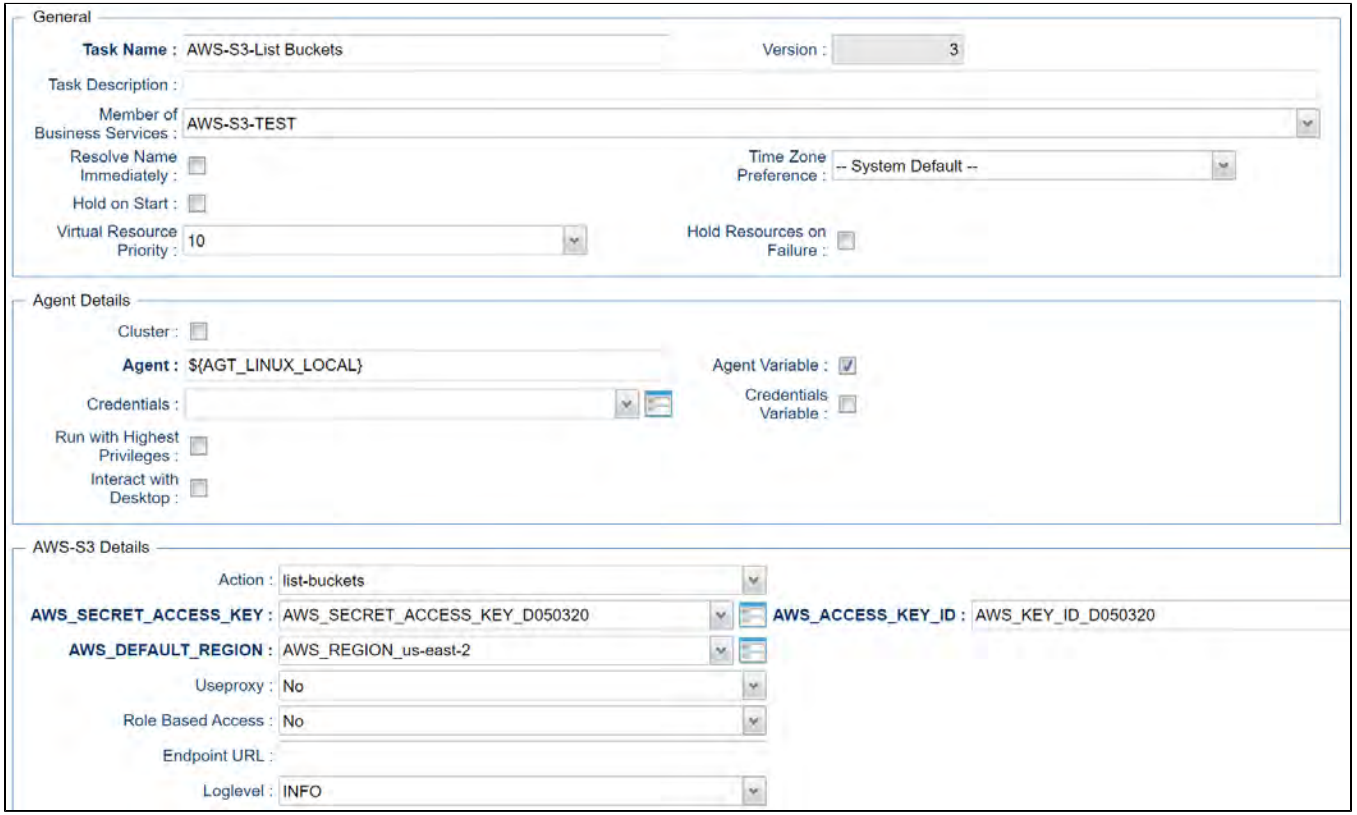
List Buckets - Action

The Action list all buckets of an AWS Account.

Field	Description
Action	list-buckets action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)

Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection e.g. rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system

Example for AWS S3 Universal Tasks - List Buckets

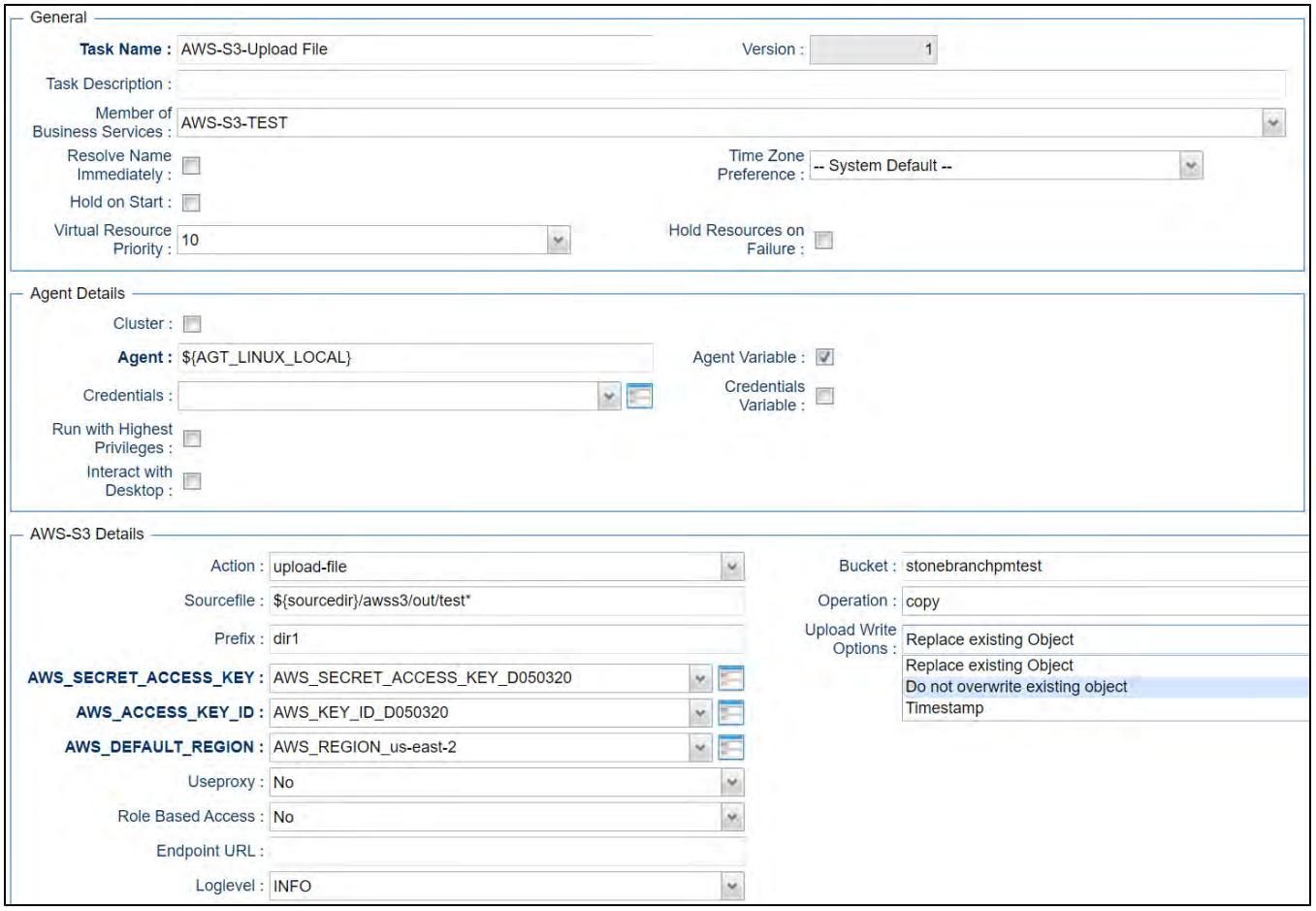


Upload File - Action

The Action is used to upload a single or multiple files from a Windows or Linux server to an AWS bucket or a folder in an AWS bucket.

Field	Description
Action	Upload-file action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection e.g. rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage
Sourcefile	Source file(s) to be uploaded to a bucket or specific folder in a bucket. Unix filename pattern are supported to upload a selection of files. Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • "*" matches everything
Operation	[copy | move] In case of a "move" the source file(s) is/are deleted after the upload to the bucket.
Prefix	A folder in a bucket is called prefix in AWS. In the field Prefix only the name of the folder needs to be provided no "/" after the folder name.
Upload Write Options	Upload Write Options [Replace existing Object | Do not overwrite existing Object | Timestamp] • Replace existing Object: Overwrite an existing object • Do not overwrite existing Object: Cancel the operations in case an object with a similar name exists • Timestamp: Add a timestamp to the uploaded Object

Example for AWS S3 Universal Tasks - Upload File



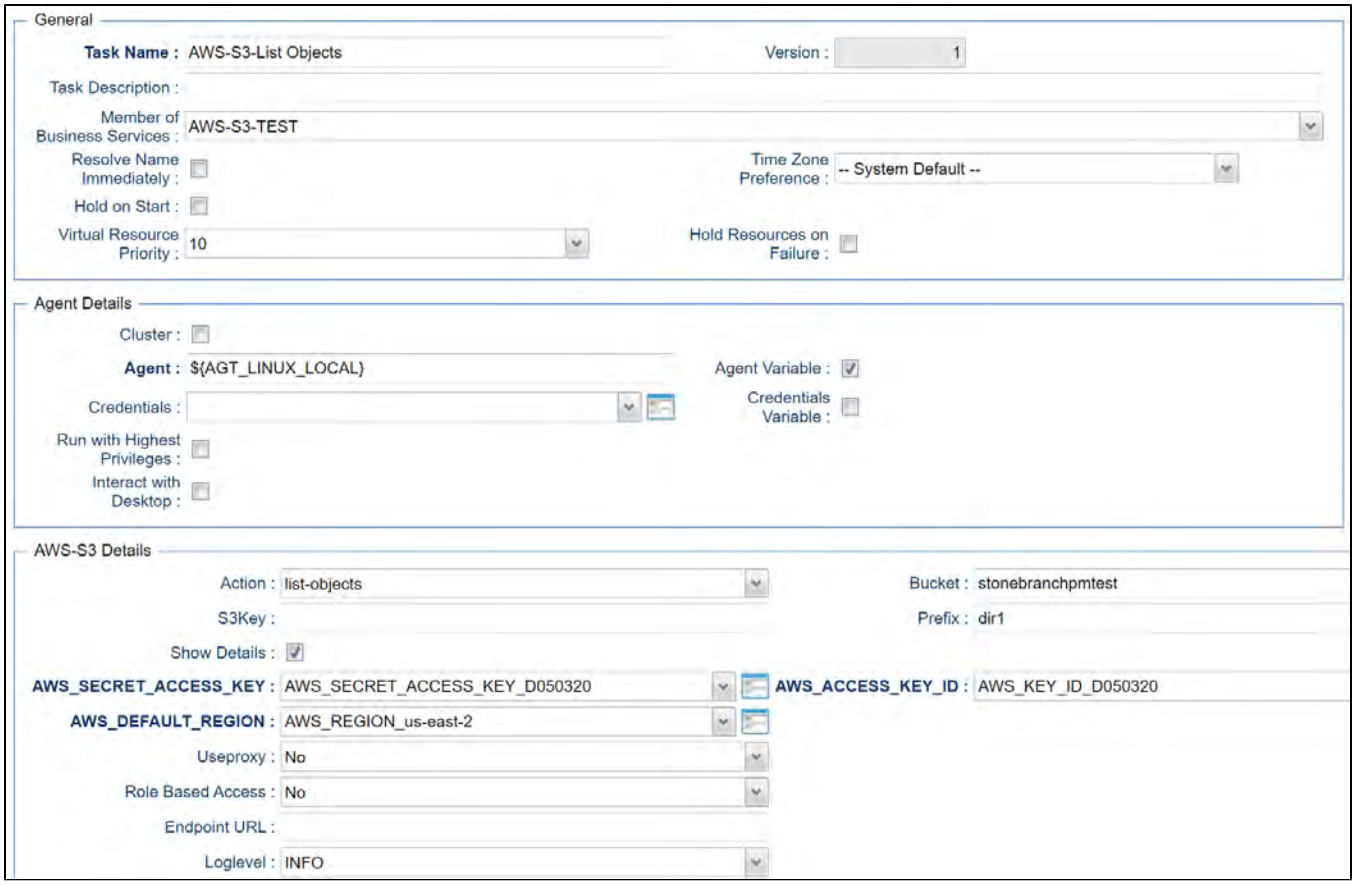
List Objects - Action

The Action is used to display objects in a bucket or a specific bucket folder (prefix).

Field	Description
Action	List-objects action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key

Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection e.g. rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system
Bucket	Bucket name in AWS
Prefix	A folder in a bucket is called prefix in AWS. In the field Prefix only the name of the folder needs to be provided no “/” after the folder name. If a prefix is provided only objects in the folder with the prefix name are listed in the output.
S3key	Objects matching the given S3key are listed. Unix filename pattern are supported to list only a selection of files: Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • ”*” matches everything Example: S3key = test* : matches everything starting with test S3key = test[1-2].txt : matches test1.txt, test2.txt S3key = test[!1].txt: does not match test1.txt S3key = test?.txt: matches test1.txt, test2.txt etc.
Show Details	Show details like creation timestamp in the output

Example for AWS S3 Universal Tasks - List Objects



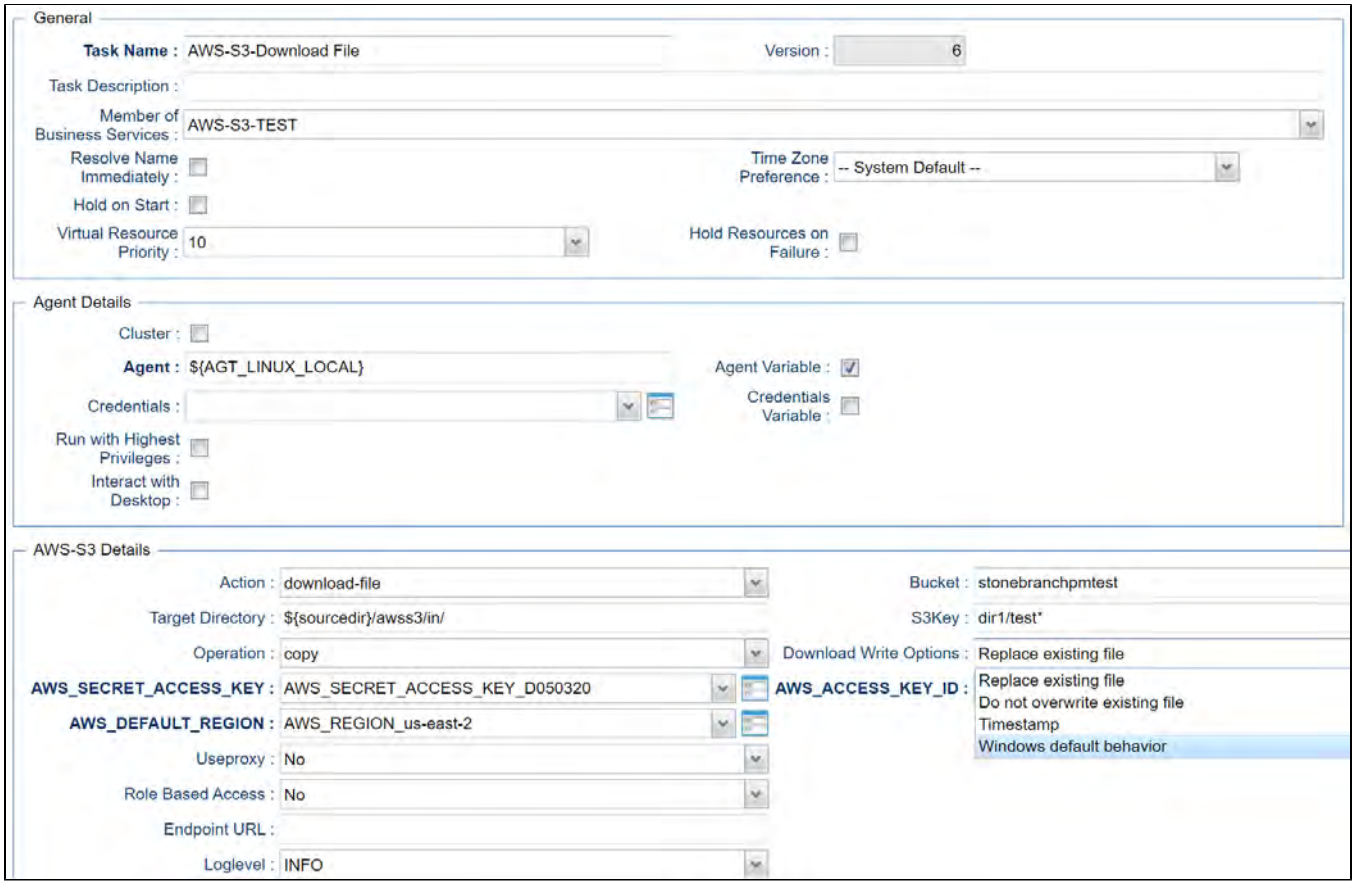
Download File - Action

This Action downloads one or multiple files from a bucket to a Linux or Windows folder

Field	Description
Action	Download-file action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key

Useproxy (default is NO)	[*NO* | *YES*] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection e.g. rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system
Target Directory	Linux or Windows Target Directory For example, C:\tmp\ or /home/ubuntu/download Unix filename pattern are supported to download a selection of files. Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • ”*” matches everything
Operation	[copy | move] In case of a “move” the objects are deleted after they have been download from the bucket.
Download Write Options	Download Write Options: [Replace existing File | Do not overwrite existing File | Timestamp | Default Windows behaviour] • Replace existing File : overwrite an existing file • Do not overwrite existing File: cancel the operations in case a File with a similar name exists • Timestamp: add a timestamp to the uploaded file • Default Windows behaviour: perform the default Windows behaviour for copying files. If a file with a similar name exists, the file names that are similar will be edited so that the files you copied have a number appended at the end of them. For example, if you’re copying a file named image.png to a folder that already has a file named image.png in it, the copied file will be named image (1).png.

Example for AWS S3 Universal Tasks - Download File



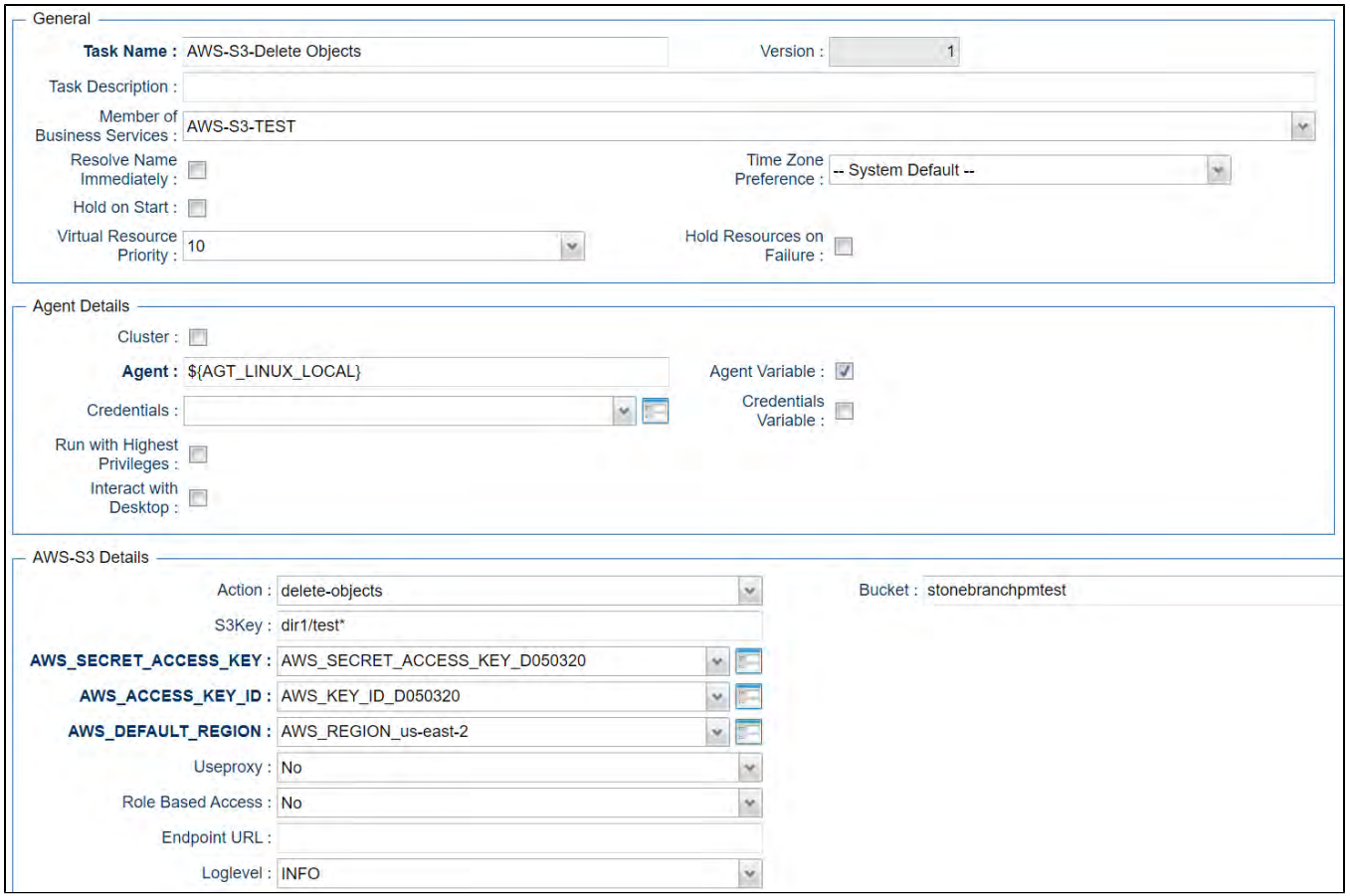
Delete Objects - Action

The Actions is used to delete an object in a bucket or folder.

Field	Description
Action	Delete-objects action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname

	• Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection e.g. rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system
Bucket	AWS bucket name
S3key	Key to be deleted in AWS Note: Due to security reasons wild card is only support, if at least one character is provided e.g. t* would delete all files starting with at “t”.

Example for AWS S3 Universal Tasks - Delete Objects



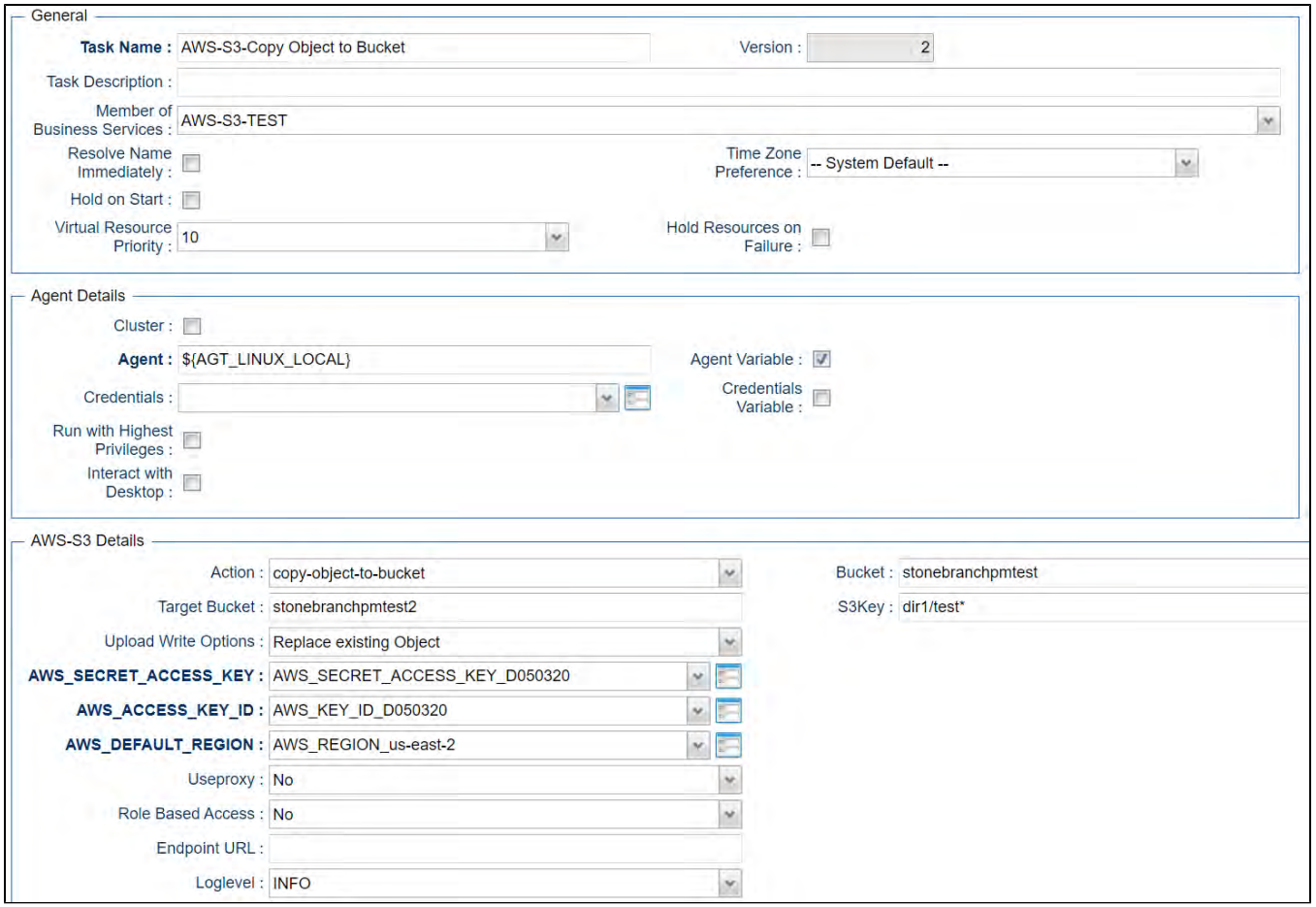
Copy Object to Bucket - Action

This Action is used copy a single or multiple objects from one bucket to another bucket in AWS

Field	Description
Action	Copy-object-to-bucket action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed:

	• Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection e.g. rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system
Bucket	AWS bucket name
Target Bucket	target Bucket, where the object(s) will be copied to
S3key	File to be copied from one bucket to another
Upload Write Options	Upload Write Options [Replace existing Object | Do not overwrite existing Object | Timestamp] • Replace existing Object: Overwrite an existing object • Do not overwrite existing Object: Cancel the operations in case an object with a similar name exists • Timestamp: Add a timestamp to the uploaded Object

Example for AWS S3 Universal Tasks - Copy Object to Bucket



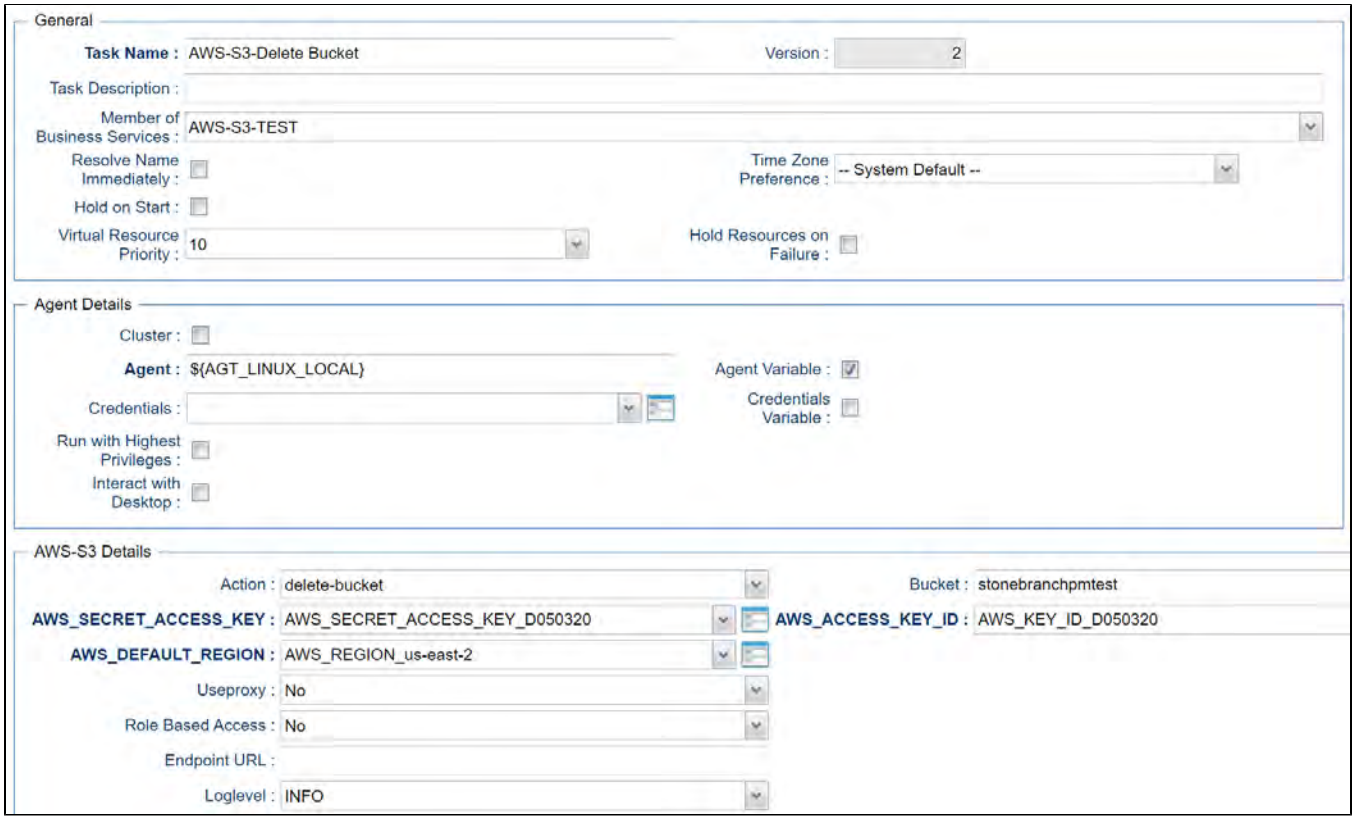
Delete Bucket - Action

This action is used to delete a bucket

Field	Description
Action	Delete-bucket action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES]

	If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection e.g. rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system
Bucket	Name of the bucket to be deleted

Example for AWS S3 Universal Tasks - Delete Bucket



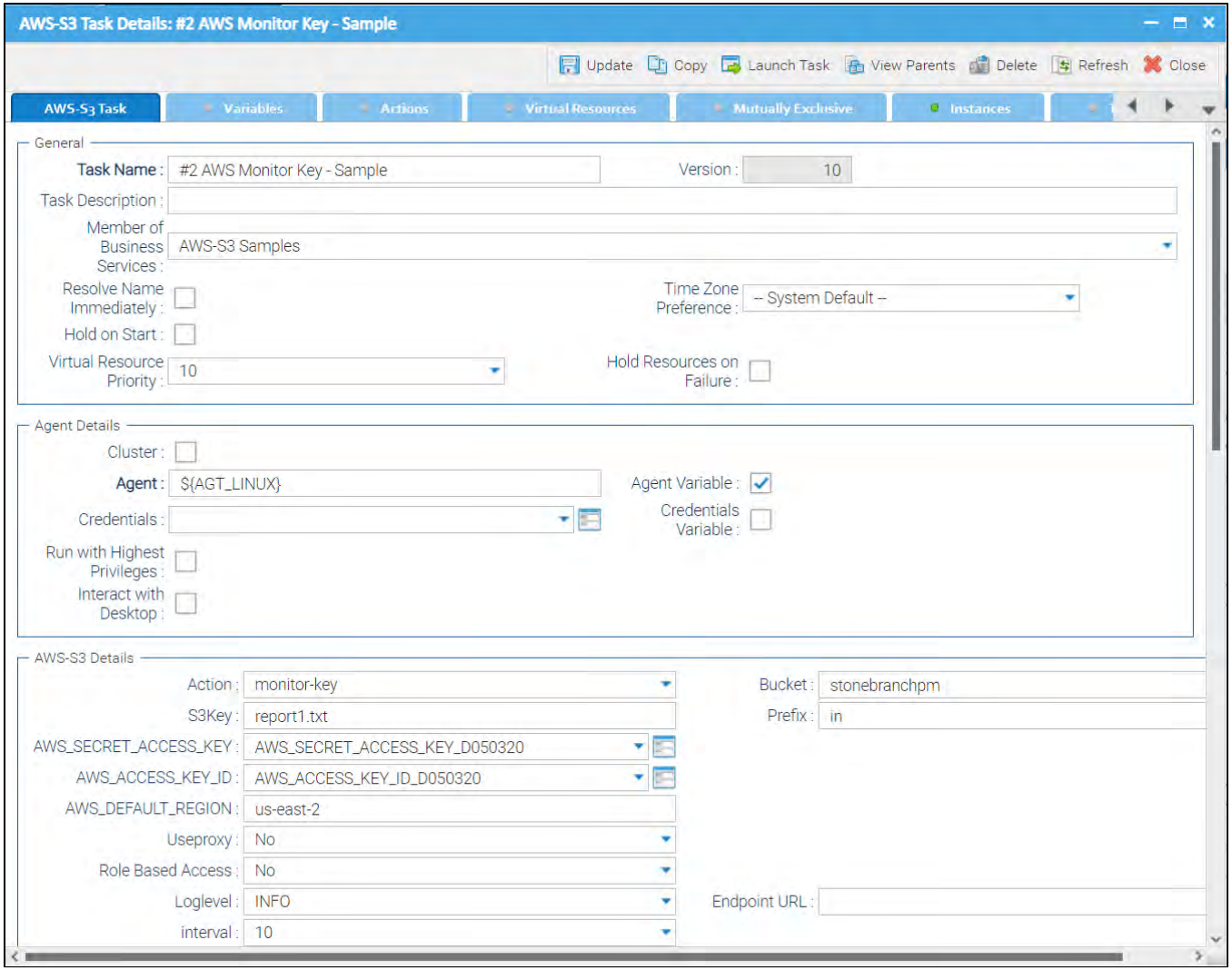
Monitor Key - Action

This Action is used to monitor for a key(s) in a bucket

Field	Description
Action	monitor-key action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account credentials Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname

	• Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection e.g. rn:aws:iam::111222333444:role/SB-AWSS3 • Service Name [STS | S3] , default is STS STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system
Bucket	Bucket name in AWS
Prefix	A folder in a bucket is called prefix in AWS. In the field Prefix only the name of the folder needs to be provided no “/” after the folder name. If a prefix is provided only objects in the folder with the prefix name are listed in the output.
S3key	Objects matching the given S3key are listed. Unix filename pattern are supported to list only a selection of files: Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • ”*” matches everything Example: S3key = test* : matches everything starting with test S3key = test[1-2].txt : matches test1.txt, test2.txt S3key = test[!1].txt: does not match test1.txt S3key = test?.txt: matches test1.txt, test2.txt etc.
Interval	[10 | 60 | 180] Monitoring Interval in seconds Example: An Interval of 60s means every 60s the bucket is scanned for the key(s) to monitor.

Example for AWS S3 Universal Tasks - Monitor Key


AWS-S3 Task Details: #2 AWS Monitor Key - Sample
Update
Copy
Launch Task
View Parents
Delete
Refresh
Close
AWS-S3 Task
Variables
Actions
Virtual Resources
Mutually Exclusive
Instances
General
Task Name :
#2 AWS Monitor Key - Sample
Version :
10
Task Description :
Member of Business Services :
AWS-S3 Samples
Resolve Name Immediately :
Time Zone Preference :
-- System Default --
Hold on Start :
Virtual Resource Priority :
10
Hold Resources on Failure :
Agent Details
Cluster :
Agent :
${AGT_LINUX}
Agent Variable :
Credentials :
Credentials Variable :
Run with Highest Privileges :
Interact with Desktop :
AWS-S3 Details
Action :
monitor-key
Bucket :
stonebranchpm
S3Key :
report1.txt
Prefix :
in
AWS_SECRET_ACCESS_KEY :
AWS_SECRET_ACCESS_KEY_D050320
AWS_ACCESS_KEY_ID :
AWS_ACCESS_KEY_ID_D050320
AWS_DEFAULT_REGION :
us-east-2
Useproxy :
No
Role Based Access :
No
Loglevel :
INFO
Endpoint URL :
interval :
10

AWS SQS

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Disclaimer

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Stonebranch assumes no liability for any issues caused by the performance of this download.

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Introduction

Amazon Simple Queue Service (SQS) is a fully managed message queuing service that enables you to decouple and scale microservices, distributed systems, and serverless applications.

Overview

Using SQS, you can send, store, and receive messages between software components.

The Universal Task for SQS allows you to create, send and monitor AWS SQS messages and automatically trigger a Task in Universal Controller once a message has been received.

Software Requirements

Software Requirements Universal Agents and Controller

- Universal Agent for Linux or Windows Version 6.9.0.0 or later are required

Software Requirements Universal Controller

- Universal Controller 6.9.0.0. or later is required
- A Universal Controller license key with support for SAP connector is required

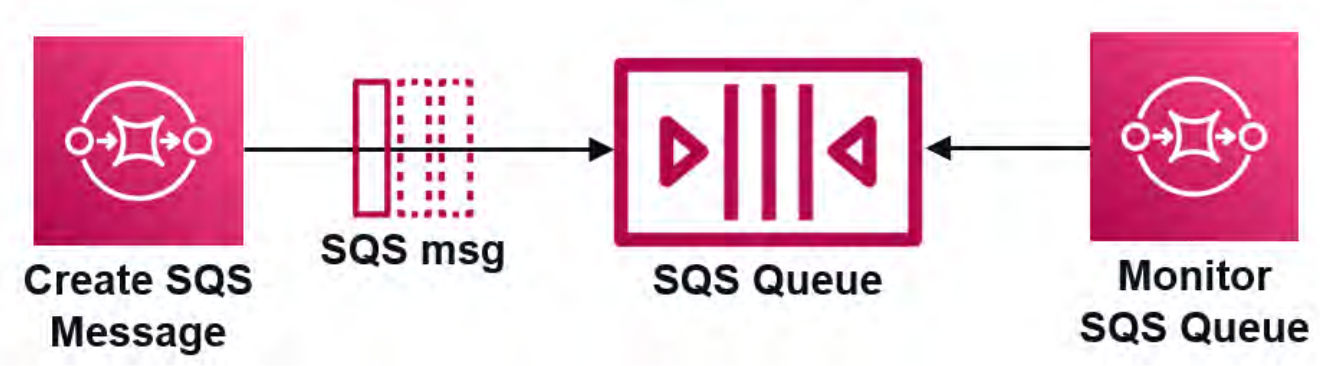
Software Requirements for the Application to be Scheduled

In order to connect to the SAP System the SAP NetWeaver RFC SDK 7.50 libraries are required from SAP.

Those can be downloaded from the SAP Software Download: SAP NetWeaver RFC SDK 7.50

Universal Task for AWS SQS Key Features

Some details about the Universal Tasks for AWS SQS:



- The Universal Tasks for SQS allows you to create, send and monitor for new AWS SQS messages.
- The Universal Task for SQS can trigger a Task in Universal Controller upon each arrival of a new message
- Credentials for AWS S3 are stored in an encrypted format in the database
- IAM Role-Based Access Control (RBAC) is supported
- Communication to AWS is done via the HTTPS protocol
- A Proxy Server connection to AWS with basic authentication is supported
- You can create and send a SQS message out of any modern application by calling the Universal Controller Remote Webservice API
- The new SQS task can be integrated into any existing or new automation workflow like any other task.
- The Universal template script is using the Python Boto3 Module. This allows to quickly introduce new AWS Service and to update the current SQS Task when new requirements occur.
- You can set different log-levels for the Universal task, providing you more information in case of issues

Import AWS SQS Virtual Machine Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure AWS SQS Universal Tasks

For the new Universal Task type AWS SQS, create a new task and enter the task-specific Details that were created in the Universal Template.

Field Descriptions for AWS SQS Universal Task - Actions

The AWS SQS Task provides three different Actions.

- receive-message
- list-queues
- send-message

For each action, the specific fields are described and an example is provided.

list-queues - Action

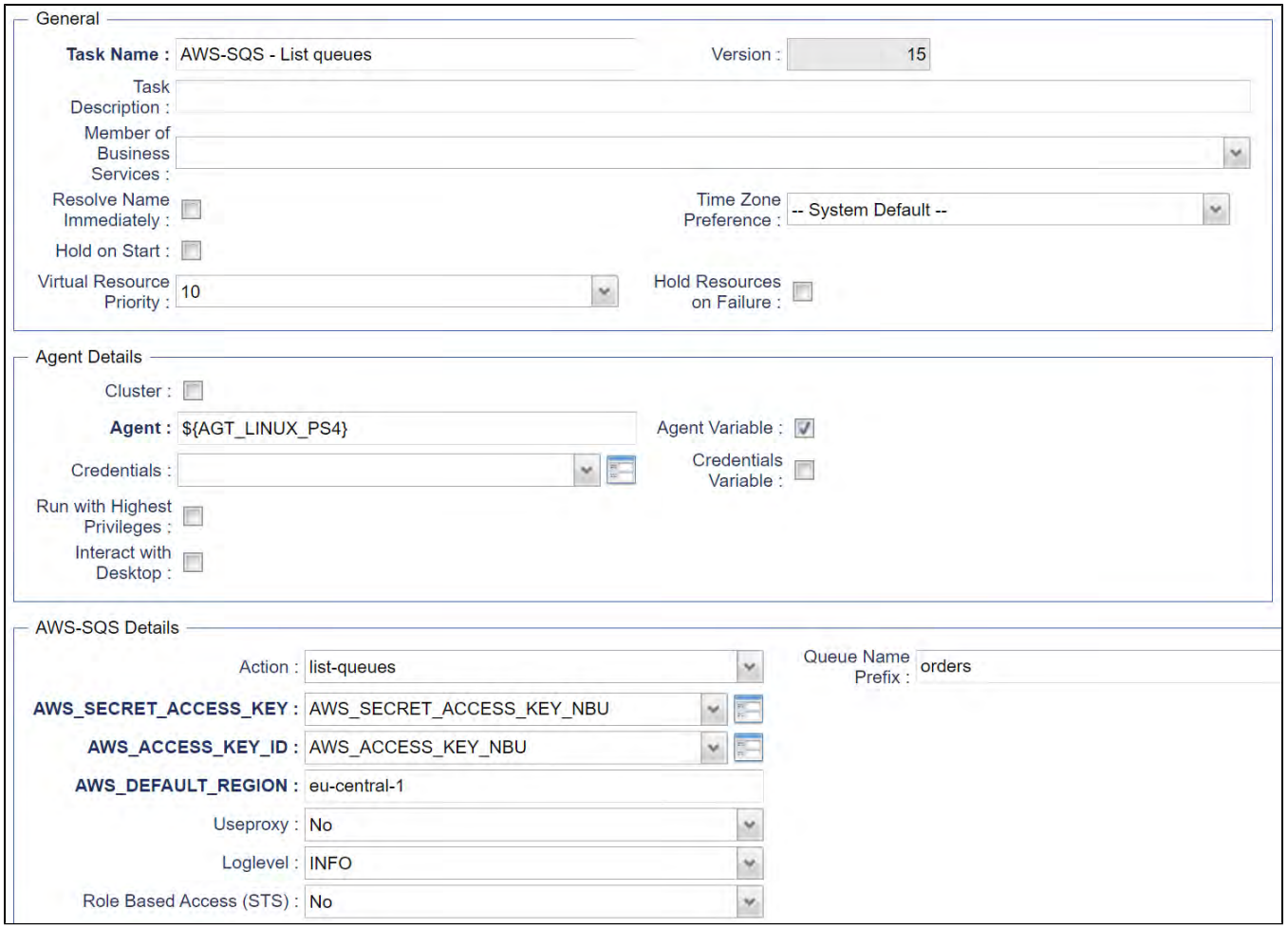
The Action list the available SQS queues for the given AWS Account and Role ARN (optional).

Field	Description
Action	list-queues action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Queue Name Prefix	A string to use for filtering the list results. Only those queues whose name begins with the specified string are returned. Queue URLs and names are case-sensitive.

	e.g. Queue Name Prefix = orders , will list all Queues starting with the name orders
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access (STS)	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection Example RoleArn: *arn:aws:iam::119322085622:role/SB-SQS-ReadOnly* STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources like SQS Queues.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system

Examples for AWS SQS Universal Tasks - Action: list-queues

List-Queues - Action



Send-message - Action

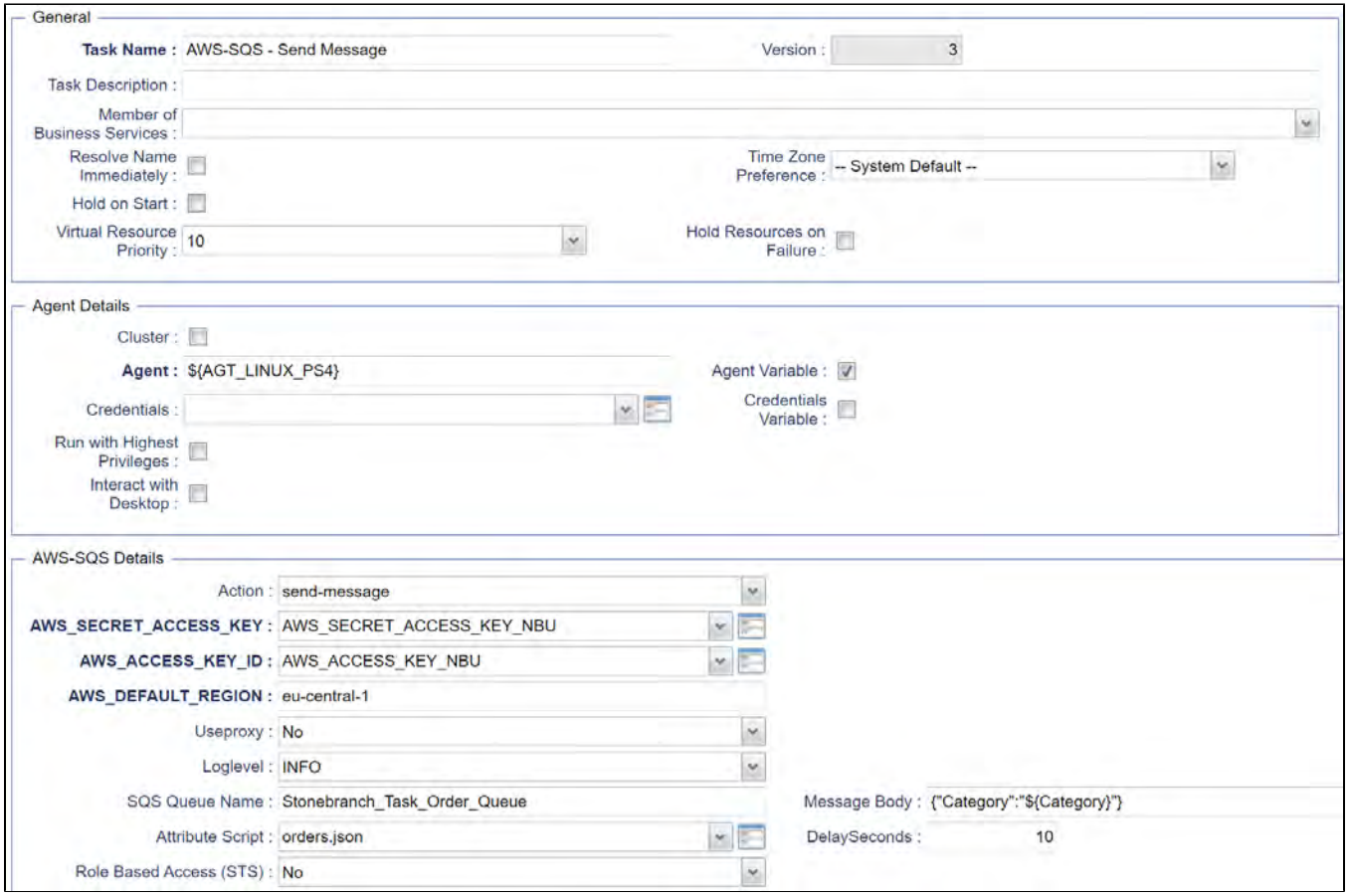
This Action inserts a message into the given AWS SQS queue. The message Body and Attributes are configurable.

Field	Description
Action	send-message action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account Region

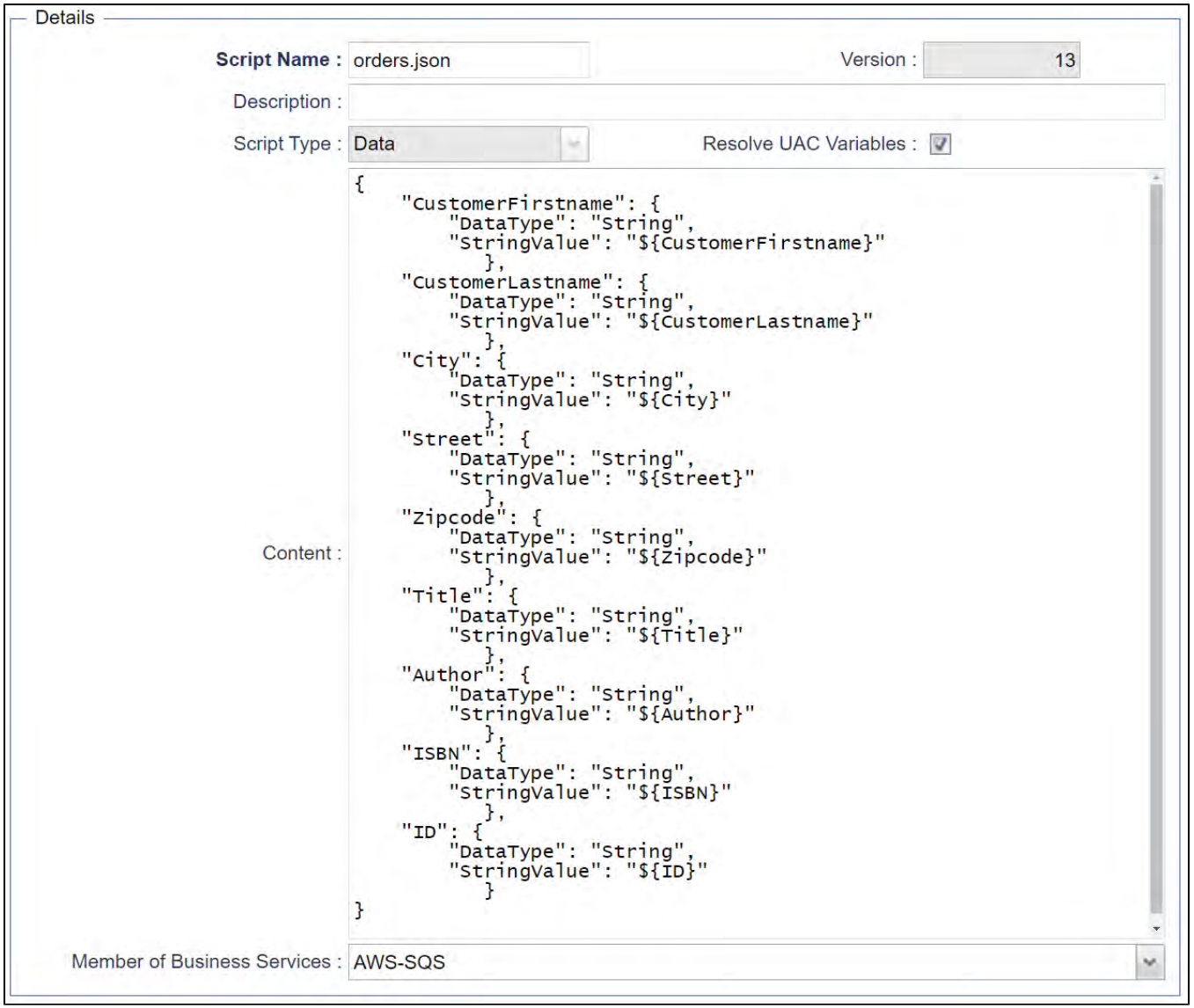
AWS_SECRET_ ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
SQS Queue Name	Name of the SQS Message queue Queue names are case-sensitive.
Message Body	SQS Message Body The message must contain the parameter Message Body. Parameter is of Type string. Example: {"Category":"Books"}
Attribute Script	The Attribute Script is a script in json format, which is saved in the Controller script library. Each message attribute consists of a `Name` , `Type` , and `Value` . The message attributes can be provided using JSON format. Example of Attribute Script with 2 Attributes: `{ "CustomerFirstname": { "DataType": "String", "StringValue": "Nils" }, "CustomerLastname": { "DataType": "String", "StringValue": "Buer" } }` Amazon SQS lets you include structured metadata (such as timestamps, geospatial data, signatures, and identifiers) with messages using *message attributes*. Each message can have up to 10 attributes. Message attributes are optional and separate from the message body (however, they are sent alongside it).
Delay Seconds	The length of time, in seconds, for which to delay a specific message. Valid values: 0 to 900. Maximum: 15 minutes. Messages with a positive DelaySeconds value become available for processing after the delay period is finished. If you don't specify a value, the default value for the queue applies.
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access (STS)	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection Example RoleArn: *arn:aws:iam::119322085622:role/SB-SQS-ReadOnly* STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources like SQS Queues.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system

Examples for AWS SQS Universal Tasks - Action: send-message

Send-message - Action



Attribute Script Example



Script Example: orders.json

```
{
    "CustomerFirstname": {
        "DataType": "String",
        "StringValue": "${CustomerFirstname}"
```

```
            },
        "CustomerLastname": {
            "DataType": "String",
            "StringValue": "${CustomerLastname}"
            },
        "City": {
            "DataType": "String",
            "StringValue": "${City}"
            },
        "Street": {
            "DataType": "String",
            "StringValue": "${Street}"
            },
        "Zipcode": {
            "DataType": "String",
            "StringValue": "${Zipcode}"
            },
        "Title": {
            "DataType": "String",
            "StringValue": "${Title}"
            },
        "Author": {
            "DataType": "String",
            "StringValue": "${Author}"
            },
        "ISBN": {
            "DataType": "String",
            "StringValue": "${ISBN}"
            },
        "ID": {
            "DataType": "String",
            "StringValue": "${ID}"
            }
}
```

Receive-message - Action

The Action polls in configurable interval the provided SQS queue. If a message is found a Task can be launched (optional). Optionally it be configured after a message is received the task goes to success and does not continue to poll for new messages.

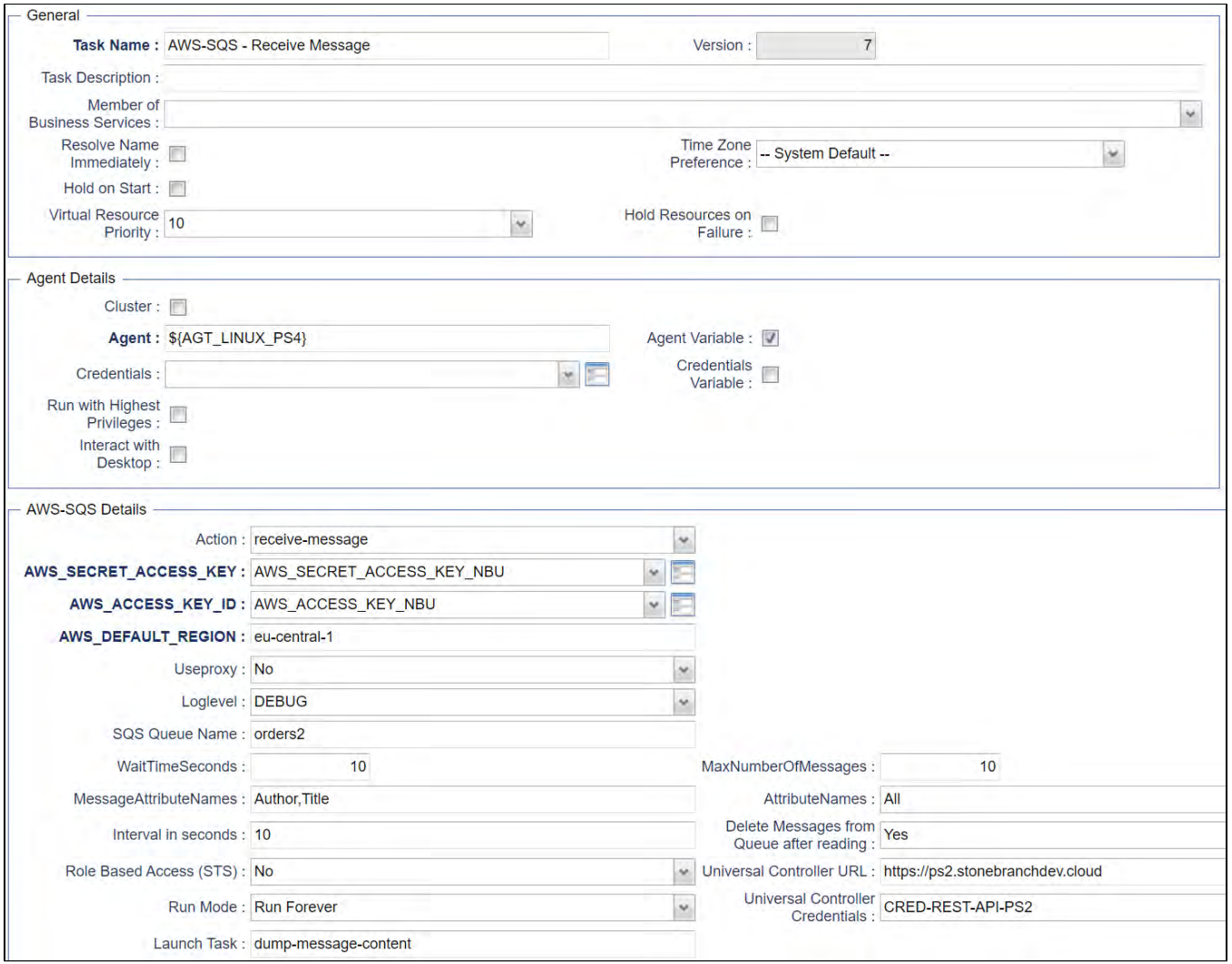
Field	Description
Action	receive-message action
AWS_ACCESS_KEY_ID	AWS Account credentials Access Key
AWS_DEFAULT_REGION	AWS Account Region
AWS_SECRET_ACCESS_KEY	AWS Account credentials Secret Access Key
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port

	• Proxy Server Credentials (optional)
Universal Controller URL	Universal Controller URL URL has no backslash “/” at the end. Example: http://192.168.88.10:8080/uc
Universal Controller Credentials	Universal Controller Credentials The Credentials need to have “Web Service Access” Permissions
Attribute Names	[All|Policy|VisibilityTimeout|MaximumMessageSize|MessageRetentionPeriod|ApproximateNumberOfMessages|ApproximateNumberOfMessagesNotVisible|CreatedTimestamp|LastModifiedTimestamp|QueueArn|ApproximateNumberOfMessagesDelayed|DelaySeconds|ReceiveMessageWaitTimeSeconds|RedrivePolicy|FifoQueue|ContentBasedDeduplication|KmsMasterKeyId|KmsDataKeyReusePeriodSeconds] For details on the attributes refer to: AWS-SQS-CLI-AttributeNames
MessageAttributeNames	[ALL | list of attributes in CSV format] Message Attributes to be returned ‘ALL’ returns all attributes of the message Example: MessageAttributeNames = Author, Title will return only the attribute for Author and Title.
WaitTimeSeconds	The duration (in seconds) for which the call waits for a message to arrive in the queue before returning. If a message is available, the call returns sooner than WaitTimeSeconds . If no messages are available and the wait time expires, the call returns successfully with an empty list of messages.
Launch Task	Taskname of the Task to launch in Universal Controller. The task will be always launched with two Task Variables: • {Body}: contains the message body in json format • {Attributes}: contains the message attributes in json format. The Variable content can be used in further processing. e.g. If a Linux task is launched by the AWS SQS Task than an *echo {Attributes}* command executed by the Linux task will print out all message attributes in json format to STDOUT.
Delete Messages from queue after reading	[Yes | No] If “Yes” the received Messages is deleted from the queue after reading
Interval in seconds	Message Polling Interval in seconds
Run Mode	[Run Once | Run Forever] • Run once : if a message is found the task goes to success • Run Forever : each time a new message is found the configured task is launched Example: • Run once can be used in Workflows • Run Forever can be used as Standalone Task, where each message triggers a task launch.
	The maximum number of messages to return. Amazon SQS never returns more messages than this value (however, fewer messages might be returned). Valid values: 1 to 10. Default: 1.

MaxNumberOfMessages	
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Role Based Access (STS)	[NO | YES] If set to YES, the fields to set-up the IAM Role Based Access Connection are displayed: • Role Arn: Amazon Role, which is applied for the connection Example RoleArn: *arn:aws:iam::119322085622:role/SB-SQS-ReadOnly* STS: AWS Security Token Service is used to create and provide trusted users with temporary security credentials that can control access to your AWS resources like SQS Queues.
Endpoint URL	Only used in case of a MinIO server; connection Endpoint URL for the MinIO storage system

Examples for AWS SQS Universal Tasks - Action: receive-message

Receive-message - Action


General
Task Name : AWS-SQS - Receive Message
Version : 7
Task Description :
Member of Business Services :
Resolve Name Immediately :
Time Zone Preference : -- System Default --
Hold on Start :
Virtual Resource Priority : 10
Hold Resources on Failure :
Agent Details
Cluster :
Agent : ${AGT_LINUX_PS4}
Agent Variable :
Credentials :
Credentials Variable :
Run with Highest Privileges :
Interact with Desktop :
AWS-SQS Details
Action : receive-message
AWS_SECRET_ACCESS_KEY : AWS_SECRET_ACCESS_KEY_NBU
AWS_ACCESS_KEY_ID : AWS_ACCESS_KEY_NBU
AWS_DEFAULT_REGION : eu-central-1
Useproxy : No
Loglevel : DEBUG
SQS Queue Name : orders2
WaitTimeSeconds : 10
MaxNumberOfMessages : 10
MessageAttributeNames : Author,Title
AttributeNames : All
Interval in seconds : 10
Delete Messages from Queue after reading : Yes
Role Based Access (STS) : No
Universal Controller URL : https://ps2.stonebranchdev.cloud
Run Mode : Run Forever
Universal Controller Credentials : CRED-REST-API-PS2
Launch Task : dump-message-content

Azure Blob Storage

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Introduction

Storing data in the cloud becomes an integral part of most modern IT landscapes. With Universal Automation Center you can securely automate your AWS, Azure, Google and MinIO File Transfers and integrate them into your existing scheduling flows.

As security is one of the key concerns, when moving to the cloud, the provided solution supports multi-level of security:

- Credentials for Azure Keys are stored in an encrypted form in the database
- Support for Azure Token based Shared Access Signatures (SAS)
- Communication to Azure is done via the HTTPS protocol
- A Proxy Server connection to Azure with basic authentication is supported

This Universal Task focuses on file transfer to, from and between an Azure Blob Storage.

A similar solution as for Azure Blob Storage is also available for AWS S3 and Google Cloud Storage.

Overview

The Universal Task for Azure Blob Storage allows to securely transfers files from, to and between Azure Blob Storage container and folders.

The Universal Task for Azure Blob Storage supports the following main features:

- The following file transfer commands are supported:
    - Upload a file(s) to an Azure Blob Storage container
    - Download of file(s) from an Azure Blob Storage container
    - Transfer files between Azure Blob Storage containers
    - List objects in an Azure Blob Storage container
    - Delete object(s) in an Azure Blob Storage container
    - List Azure Blob Storage container names
    - Create an Azure Blob Storage container
    - Monitor a Blob in a Storage container
- File Transfer can be triggered by a third-party application using the Universal Automation Center RESTfull Webservice API: REST API
- Universal Task for Azure Blob Storage can be integrated into any existing scheduling workflow in the same way as any standard Linux or Windows Task type.
- Security is ensured by using the HTTPS protocol with support for an optional Proxy Server.
- Support for Azure Token based Shared Access Signatures (SAS)
- No Universal Agent needs to be installed on the Azure Cloud – the communication goes via HTTPS

Software Requirements

Software Requirements for Universal Agent

- Universal Agent for Linux or Windows Version 7.0.0.0 or later are required
- The Universal Agent needs to be installed with python option (--python yes)

Software Requirements for Universal Controller

- Universal Controller 7.0.0.0. or later is required

Software Requirements for the Application to be Scheduled

The Universal Task has been tested for the python Azure Storage SDK: *azure-storage-blob version: 12.7.1*

Key Features

The solution supports the following file transfer scenarios:

Feature	Description

Upload a file(s) to a container (Copy or Move)	• One or more files can be uploaded to a container.
	• Move or copy are supported for the upload
	• Unix filename pattern matching support; for example, wild card support “*” to upload multiple files
	• One or more files can be Uploaded to a folder using a prefix
	• It can be decided via an the *Upload Write Options* to:
	  • Overwrite an existing object (*Replace existing Object*)
	  • Cancel the operations in case an object with a similar name exists (*Do not overwrite existing Object*)
	  • Add a timestamp to the uploaded Object (*Timestamp*)

Download of file(s) from a container (Copy or Move)	• One or more files should be downloaded from a bucket.
	• Move or copy must be supported for the download
	• Unix filename pattern matching support; for example, wild card support “*” to download multiple files
	• Download to a specific folder is supported
	• It can be decided via an the *Download Write Options* to:
	  • Overwrite an existing file (*Replace existing File*)
	  • Cancel the operations in case a File with a similar name exists (*Do not overwrite existing File*)
	  • Add a timestamp to the uploaded file (*Timestamp*)
	  • Perform the default Windows behaviour for copying files (*Default Windows behaviour*)
	  • If a file with a similar name exists, the file names that are similar will be edited so that the files you copied have a number appended at the end of them. For example, if you’re copying a file named image.png to a folder that already has a file named image.png in it, the copied file will be named image (1).png.

Copy object to a container	• An object can be copied from one container to another. • Folders are support Note: wild cards are not supported for this method.
List objects in a container	• Show all Objects in a container • Show all Objects in a folder • Unix filename pattern matching support e.g. wild card support “*” to narrow down the objects to display
Delete object(s) in a container	• Delete one or multiple objects in a container • Delete one or multiple objects in folder in a container • Unix filename pattern matching support e.g. wild card support “*” to narrow down the objects to be deleted
List buckets	List all container in an Azure account
Create a container	Create a new container
Monitor Blob	Monitor a Blob in a Storage container

Proxy Server Connection	A proxy server connection with or without basic authentication can be configured
Integration into 3rd Party Applications	An Azure Blob Storage file transfer can be triggered via the Universal Automation Center RESTfull Webservice API within an application.
Self-Service through Web-Client	The Azure Blob Storage Task can be fully configured, monitored and updated via the Universal Controller Web-GUI

Import Azure Blob Storage Universal Template

The Universal Template is provided as a Zip-file. This Zip-file can be imported from any local folder using the Universal Controller UI.

To load the Universal Template Zip-file perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy the Universal Template Zip-file to a local directory directory.
3. In the Universal Controller UI, select Administration > Universal Templates > Import Template.
4. Select the Universal Template Zip-file to import.

When the Universal Template Zip-file has been imported successfully, the Universal Template will appear on the list.

Configure Azure Blob Storage Universal Tasks

For the new Universal Task type, create a new task and enter the task-specific Details that were created in the Universal Template.

Field Descriptions for Azure Blob Storage Universal Task - Action

The Azure Blob Storage Task provides multiple different file transfer actions. For each action the specific fields are described.

Azure Blob Storage Container is abbreviated to **Container** in the following.

Create Container - Action

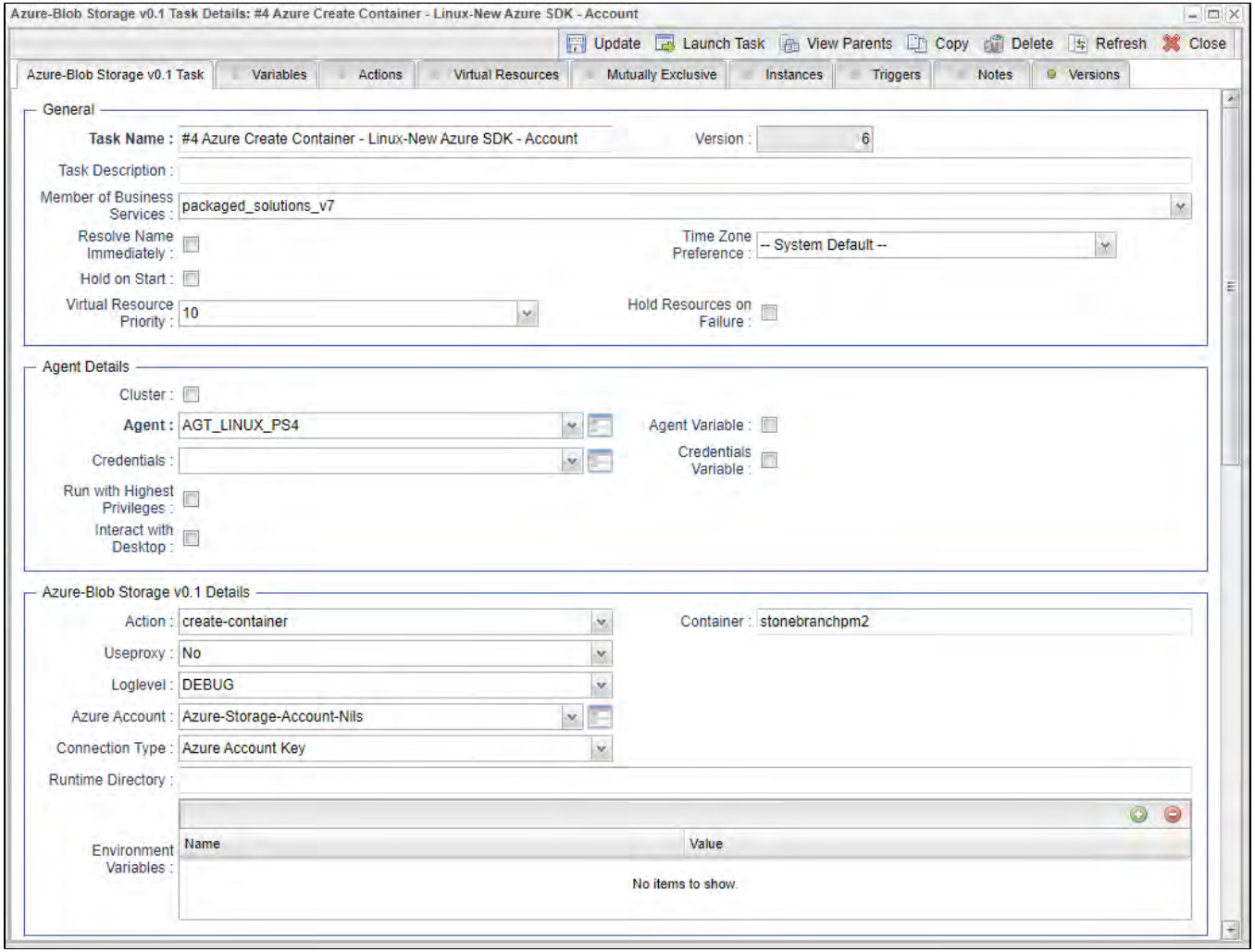
The Action Creates a new Container.

Field	Description
Action	create-container action
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Connection Type	[Azure Account Key | SAS Token]

	If set to 'Azure Account Key', the credential field 'Azure Account' will appear for configuration. If set to 'SAS Token', the credential field 'SAS Token' will appear for configuration.
Container	Name of the Container to create

Example for Azure Blob Storage Universal Tasks - Create Container

The following Task creates the Container: stonebranchpm2



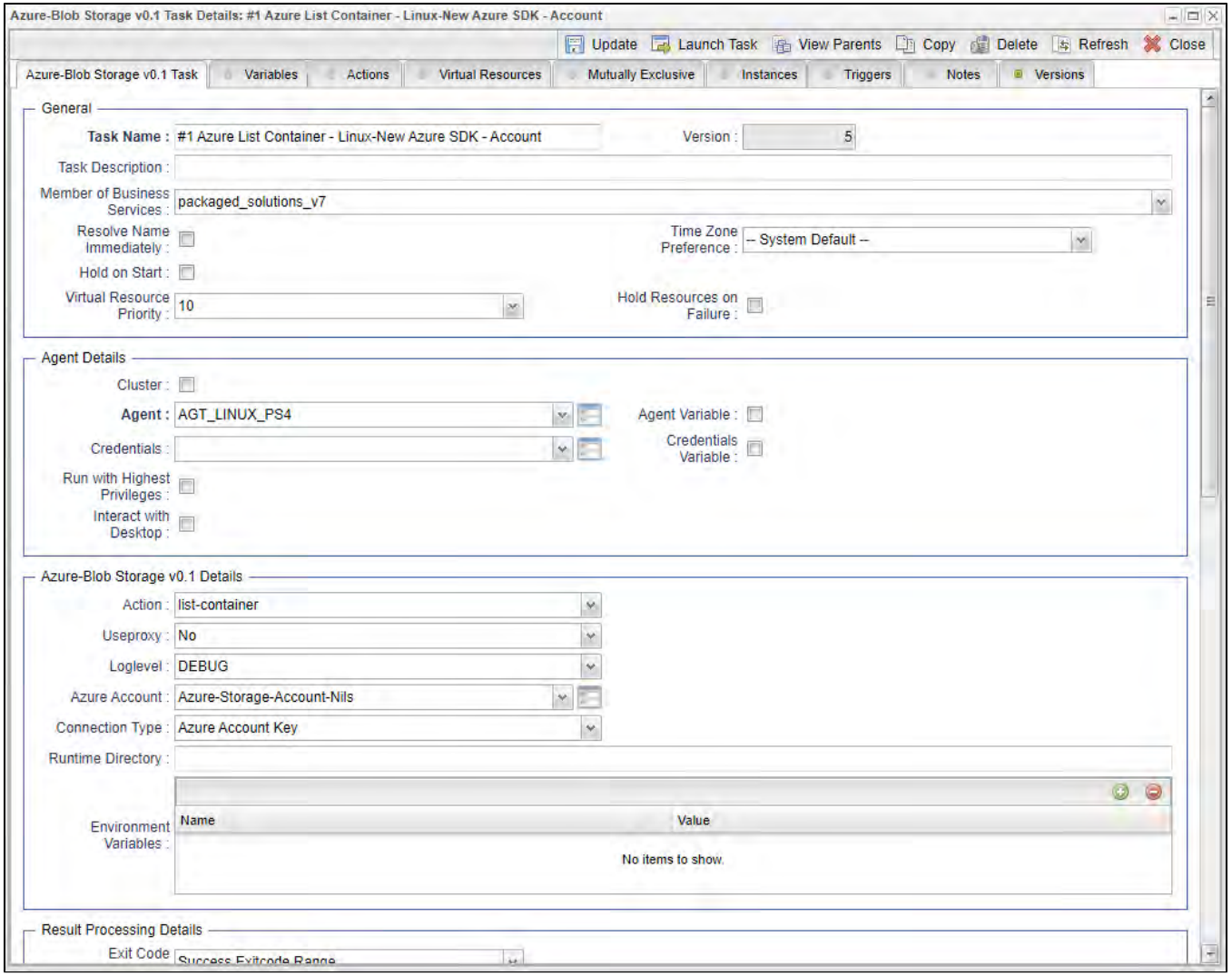
List Container - Action

The Action list all container of an Azure Account.

Field	Description
Action	list-container action
Connection Type	[Azure Account Key | SAS Token] If set to ‘Azure Account Key’, the credential field ‘Azure Account’ will appear for configuration. If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

Example for Azure Blob Storage Universal Tasks - List Containers

The following Task list all container of the selected Azure Account.



Upload File - Action

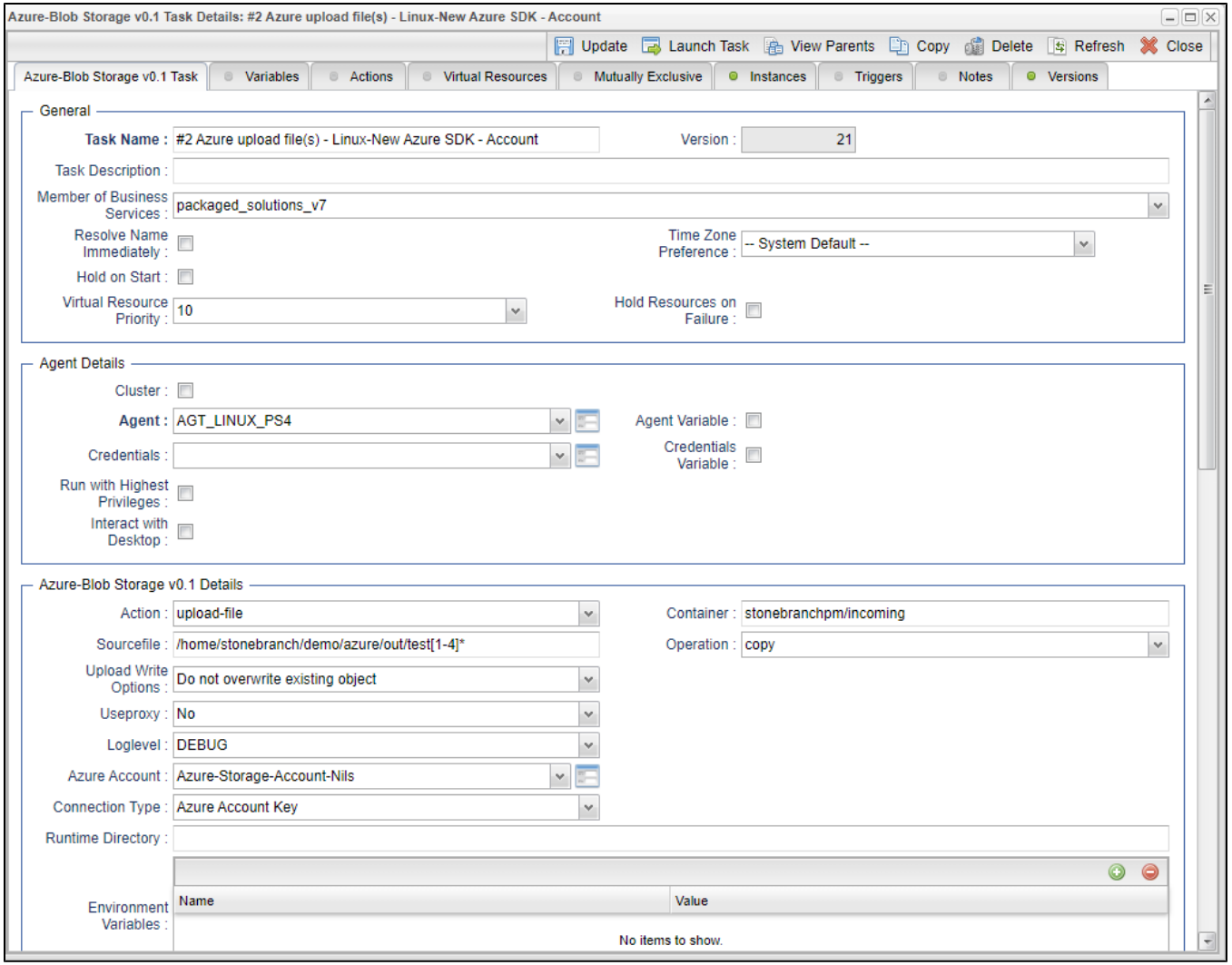
The Action is used to upload a single or multiple files from a Windows or Linux server to an container or a folder in a container.

Field	Description
Action	Upload-file action
Connection Type	[Azure Account Key | SAS Token]

	If set to ‘Azure Account Key’, the credential field ‘Azure Account’ will appear for configuration. If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Sourcefile	Source file(s) to be uploaded to a bucket or specific folder in a container. Unix filename pattern are supported to upload a selection of files. Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • ”*” matches everything
Operation	[copy | move] In case of a “move” the source file(s) is/are deleted after the upload to the container.
Prefix	A folder in a container is called prefix. In the field Prefix only the name of the folder needs to be provided no “/” after the folder name.
Upload Write Options	Upload Write Options [Do not overwrite existing Object | Timestamp] • Do not overwrite existing Object: Cancel the operations in case an object with a similar name exists • Timestamp: Add a timestamp to the uploaded Object

Example for Azure Blob Storage Universal Tasks - Upload File

The following Task uploads from the Linux directory the files: */home/stonebranch/demo/azure/out/test[1-4]** to the the container *stonebranchpm*, folder *incoming*.



List Objects - Action

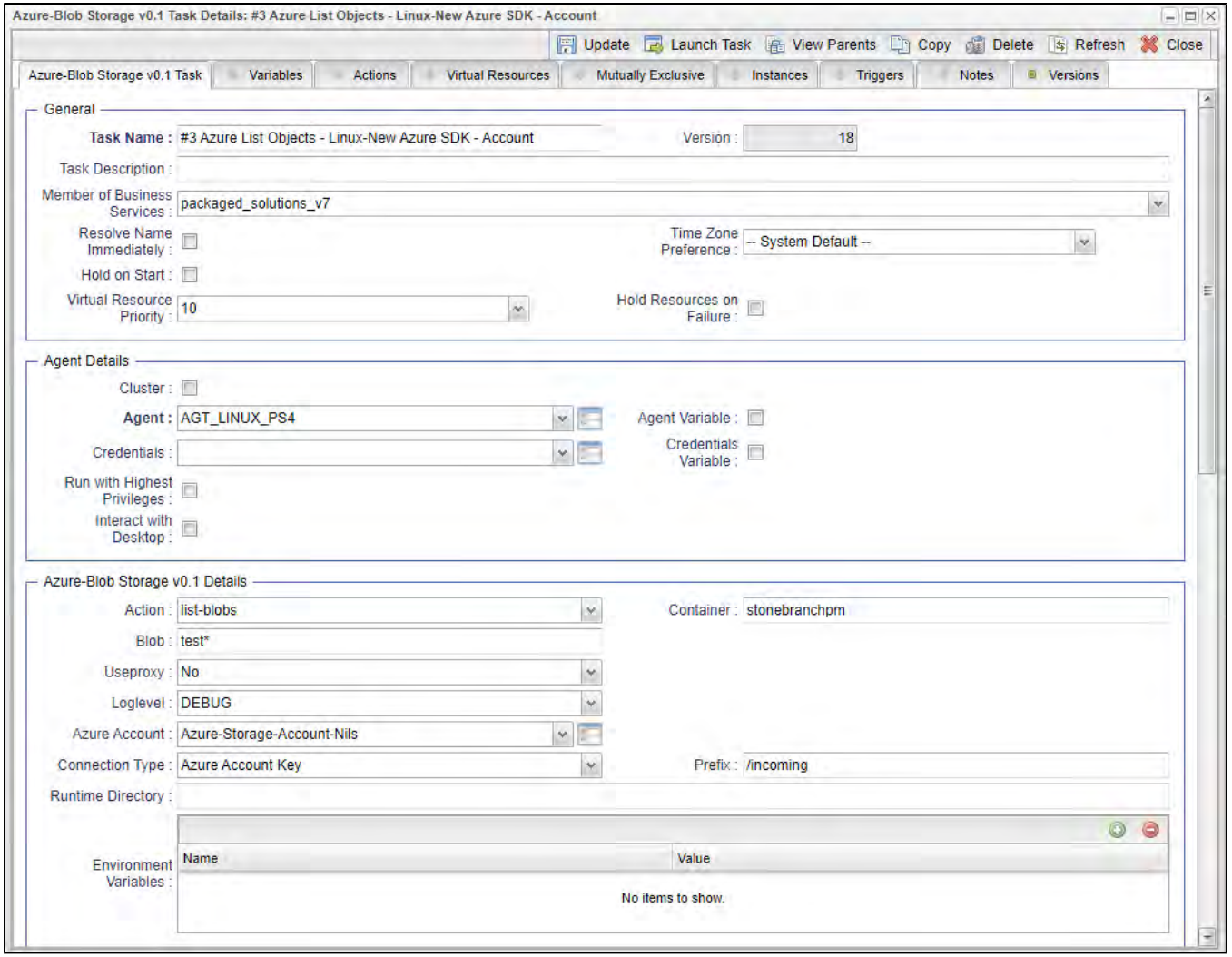
The Action is used to display objects in a Azure Container or a specific folder in an Azure Container (prefix).

Field	Description
Action	List-objects action
Connection Type	[Azure Account Key | SAS Token] If set to ‘Azure Account Key’, the credential field ‘Azure Account’ will appear for configuration.

	If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Container	Container in which the objects should be listed
Prefix	A folder in a container is called prefix. In the field Prefix only the name of the folder needs to be provided no “/” after the folder name. If a prefix is provided only objects in the folder with the prefix name are listed in the output.
Blob	Objects matching the given Blob are listed. Unix filename pattern are supported to list only a selection of files: Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • ”*” matches everything Example: Blob = test* : matches everything starting with test Blob = test[1-2].txt : matches test1.txt, test2.txt Blob = test[!1].txt: does not match test1.txt Blob = test?.txt: matches test1.txt, test2.txt etc.
Show Details	Show details like creation timestamp in the output

Example for Azure Blob Storage Universal Tasks - List Objects

The following Task list all objects matching the criteria *test** in the container *stonebranchpm* in the folder *incoming*.



Download File - Action

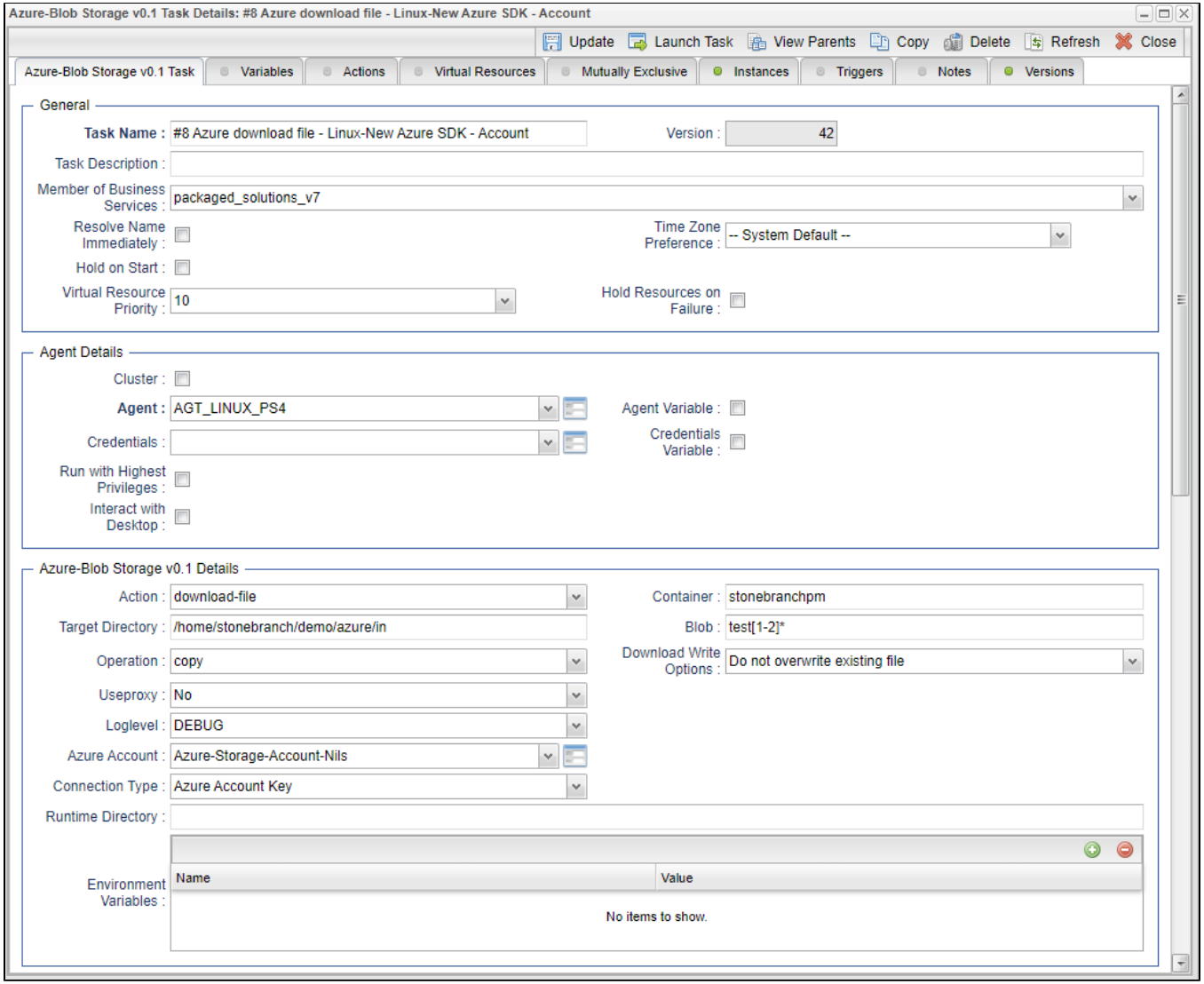
This Action downloads one or multiple files from an Azure Container to a Linux or Windows folder.

Field	Description
Action	Download-file action
Connection Type	[Azure Account Key | SAS Token] If set to ‘Azure Account Key’, the credential field ‘Azure Account’ will appear for configuration.

	If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[*NO* | *YES*] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Target Directory	Linux or Windows Target Directory For example, C:\tmp\ or /home/ubuntu/download Unix filename pattern are supported to download a selection of files. Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • ”*” matches everything
Operation	[copy | move] In case of a “move” the objects are deleted after they have been download from the container.
Download Write Options	Download Write Options: [Replace existing File | Do not overwrite existing File | Timestamp | Default Windows behaviour] • Replace existing File : overwrite an existing file • Do not overwrite existing File: cancel the operations in case a File with a similar name exists • Timestamp: add a timestamp to the uploaded file • Default Windows behaviour: perform the default Windows behaviour for copying files. If a file with a similar name exists, the file names that are similar will be edited so that the files you copied have a number appended at the end of them. For example, if you are copying a file named image.png to a folder that already has a file named image.png in it, the copied file will be named image (1).png.

Example for Azure Blob Storage Universal Tasks - Download File

The following Task downloads from the container stonebranchpm all blobs matching the criteria *test[1-2]** to the Linux directory: */home/stonebranch/demo/azure/in*



Delete Objects - Action

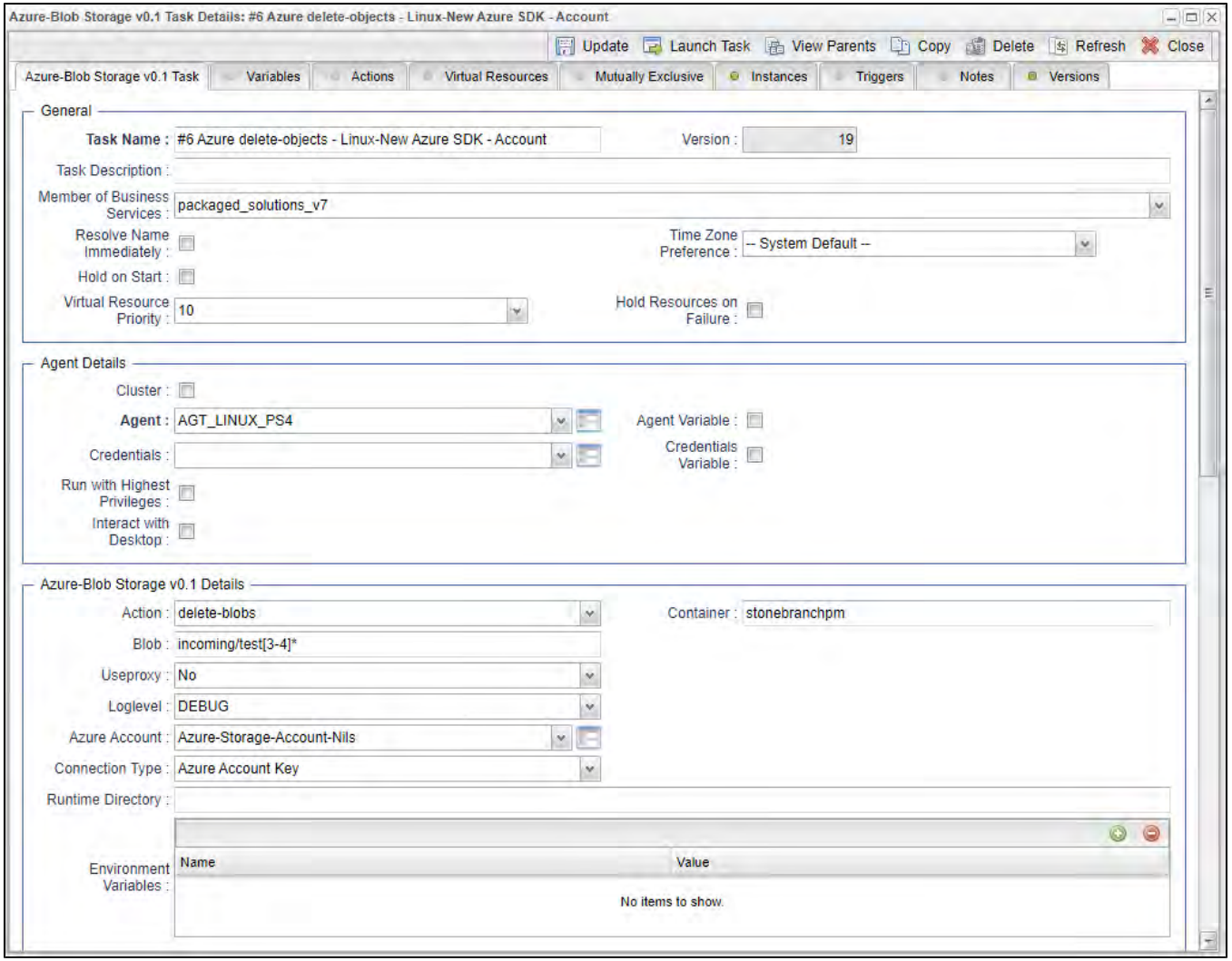
The Actions is used to delete an object in an Azure Container or folder

Field	Description
Action	Delete-objects action
Connection Type	[Azure Account Key | SAS Token]

	If set to ‘Azure Account Key’, the credential field ‘Azure Account’ will appear for configuration. If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Container	Container in which the Blobs should be deleted.
Blob	Blobs to be deleted in the given container Note: Due to security reasons wild card is only support, if at least one character is provided e.g. t* would delete all files starting with at “t”.

Example for Azure Blob Storage Universal Task - Delete Objects

The following Task deletes in the container *stonbranchpm*, folder *incoming* all Blobs matching the criteria test[3-4]*.



Copy Object to Container - Action

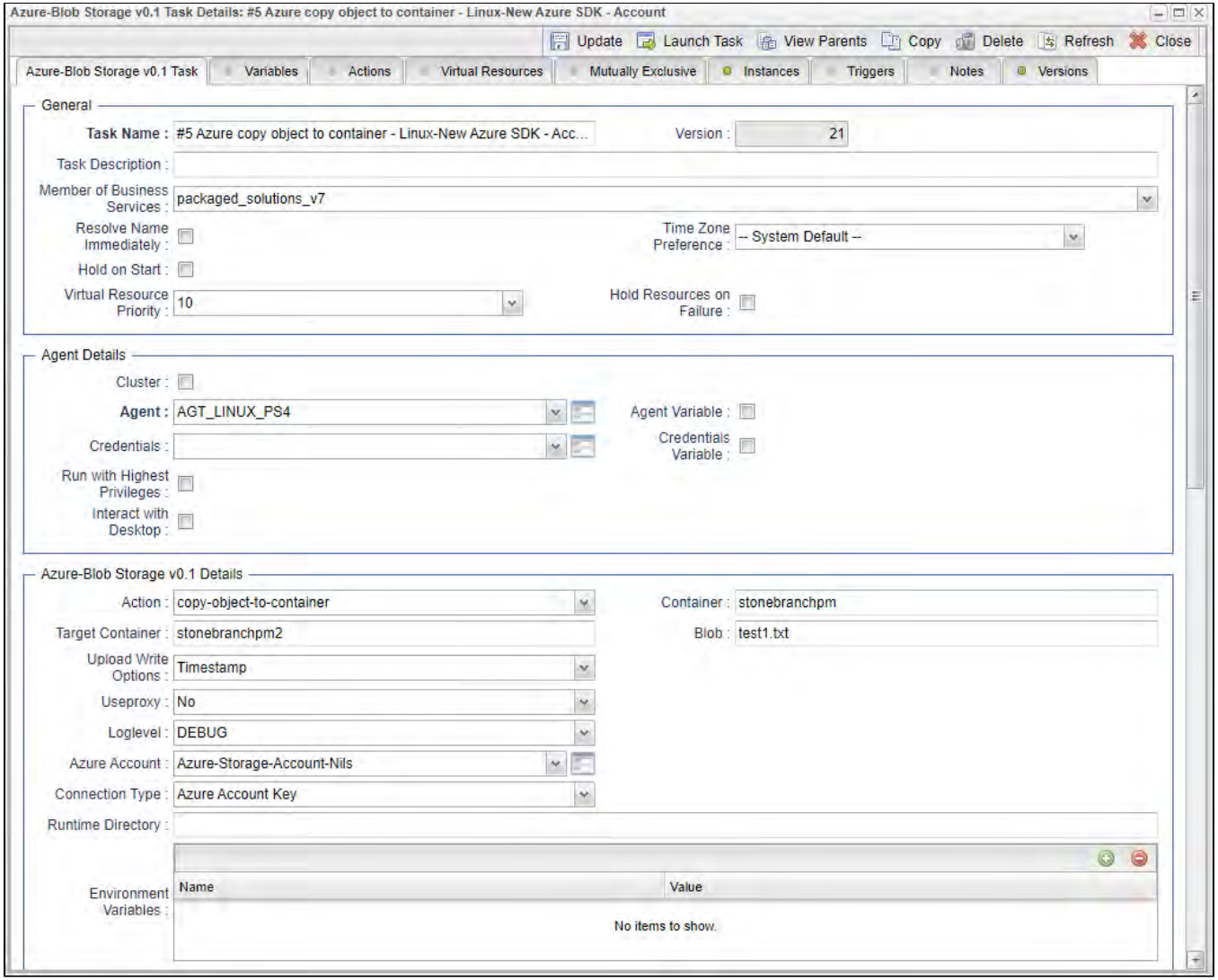
This Action is used copy an objects from one Azure Container to another Azure Container.

Field	Description
Action	Copy-object-to-bucket action
Connection Type	[Azure Account Key | SAS Token] If set to ‘Azure Account Key’, the credential field ‘Azure Account’ will appear for configuration.

	If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Container	Source container
Target Container	Target container, where the object(s) will be copied to
Blob	File (Blob) to be copied from the source container to target container.
Upload Write Options	Upload Write Options [Do not overwrite existing Object | Timestamp] • Do not overwrite existing Object: Cancel the operations in case an object with a similar name exists • Timestamp: Add a timestamp to the uploaded Object

Example for Azure Blob Storage Universal Tasks - Copy Object to Container

The following Task copies the Blob: test1.txt from the source container: *stonebranchpm* to the target container: *stonebranchpm2*



Delete Container - Action

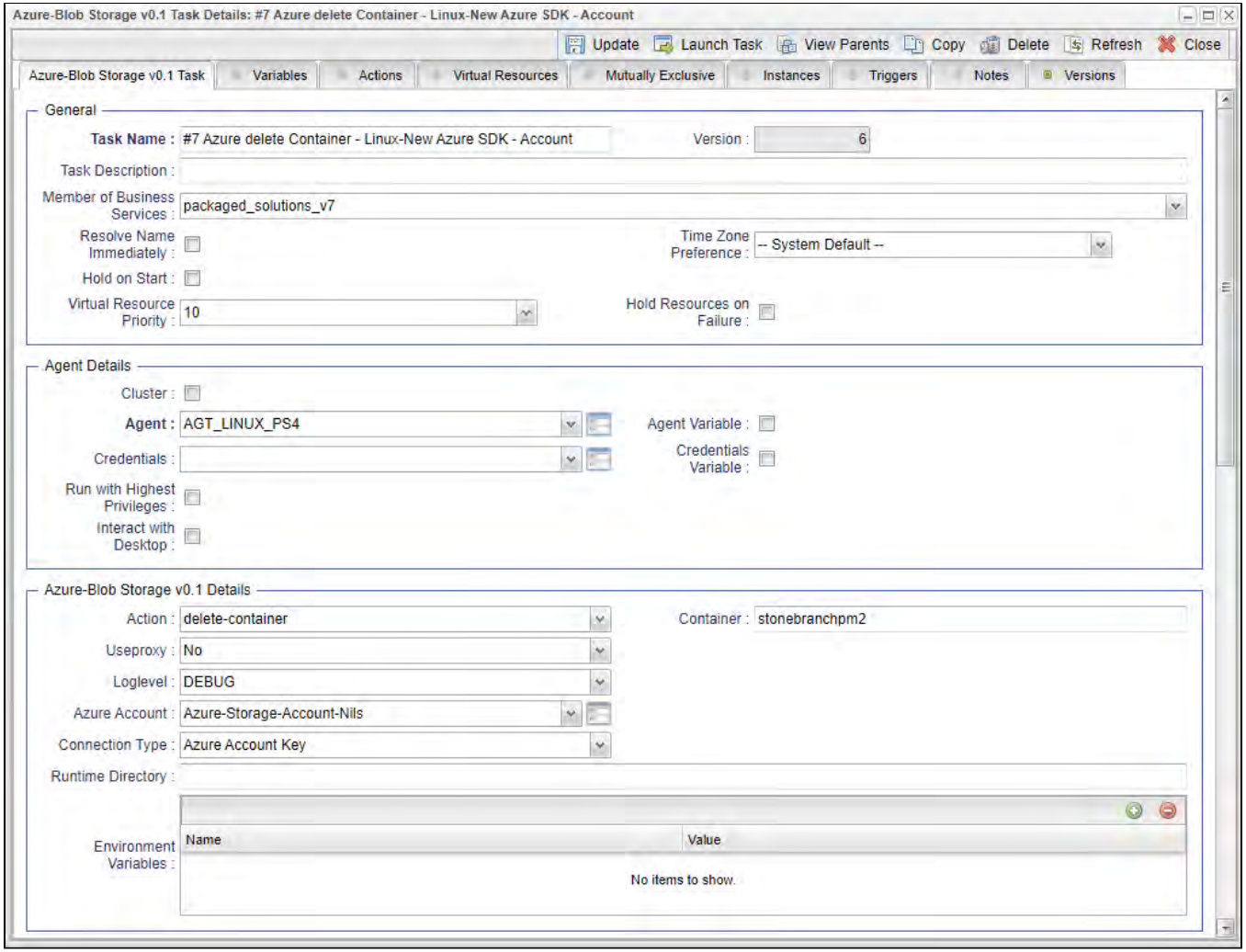
This action is used to delete an Azure Container

Field	Description
Action	Delete-container action
Connection Type	[Azure Account Key | SAS Token]

	If set to ‘Azure Account Key’, the credential field ‘Azure Account’ will appear for configuration. If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Container	Name of the Container to be deleted Note: The container is delete including all objects.

Example for Azure Blob Storage Universal Tasks - Delete Container

The following Task delete the container stonebranchpm2



Upload File - Action

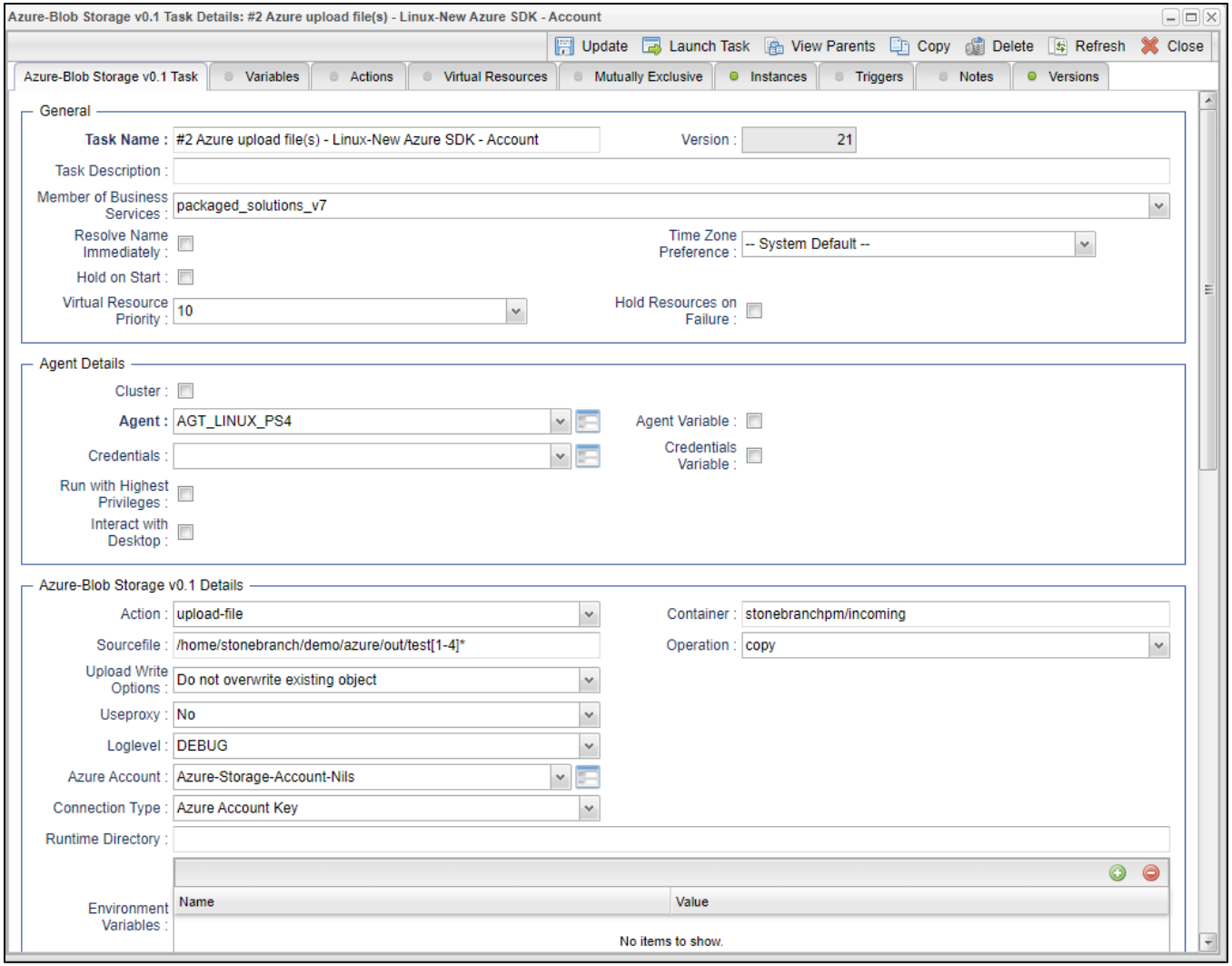
The Action is used to upload a single or multiple files from a Windows or Linux server to an container or a folder in a container.

Field	Description
Action	Upload-file action
Connection Type	[Azure Account Key | SAS Token] If set to ‘Azure Account Key’, the credential field ‘Azure Account’ will appear for configuration.

	If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Sourcefile	Source file(s) to be uploaded to a bucket or specific folder in a container. Unix filename pattern are supported to upload a selection of files. Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • ”*” matches everything
Operation	[copy | move] In case of a “move” the source file(s) is/are deleted after the upload to the container.
Prefix	A folder in a container is called prefix. In the field Prefix only the name of the folder needs to be provided no “/” after the folder name.
Upload Write Options	Upload Write Options [Do not overwrite existing Object | Timestamp] • Do not overwrite existing Object: Cancel the operations in case an object with a similar name exists • Timestamp: Add a timestamp to the uploaded Object

Example for Azure Blob Storage Universal Tasks - Upload File

The following Task uploads from the Linux directory the files: */home/stonebranch/demo/azure/out/test[1-4]** to the the container *stonebranchpm*, folder *incoming*.



Monitor Blob - Action

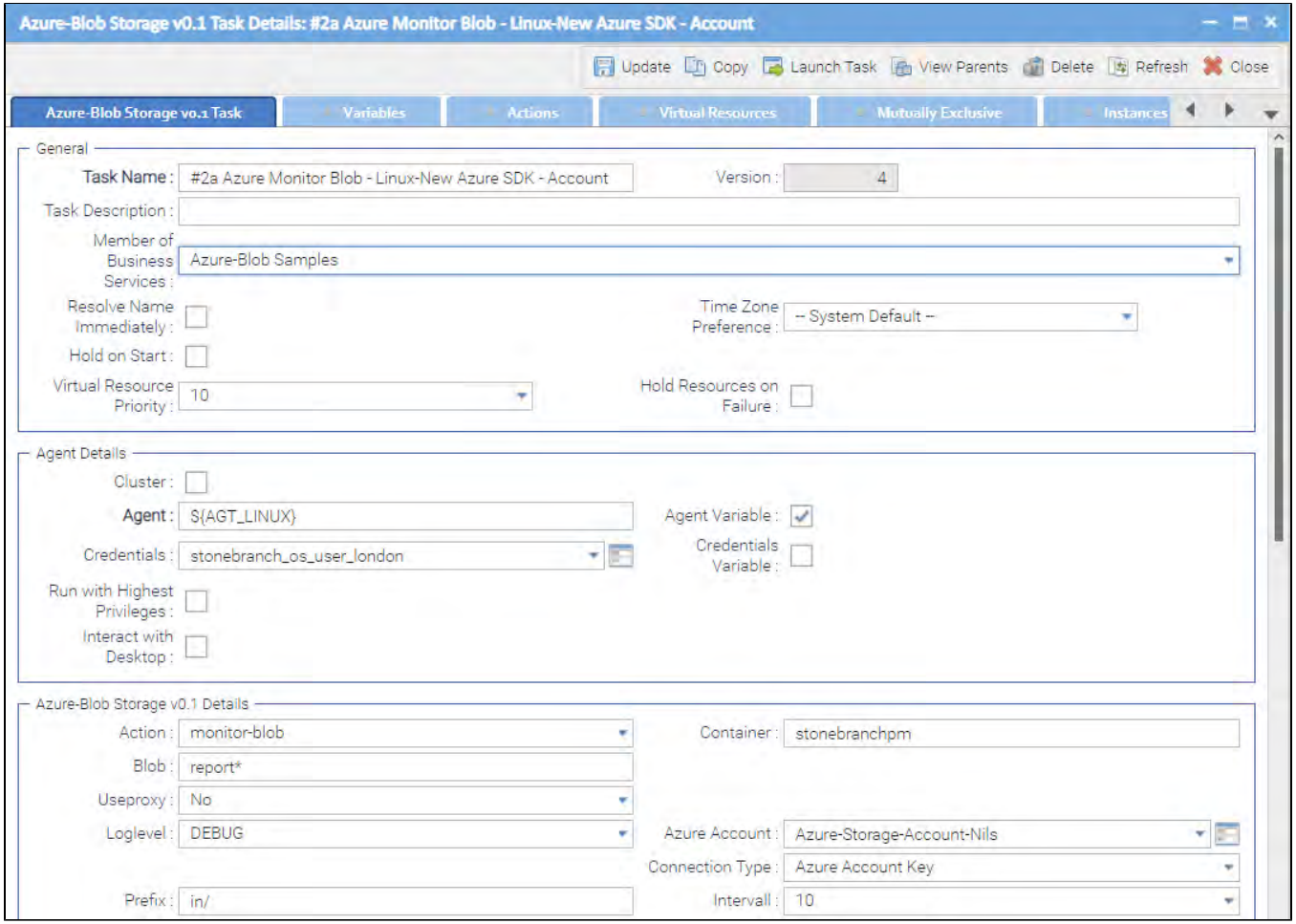
The Action is used to monitor a Blob in an Azure Container.

Field	Description
Action	Monitor-Blob action
Connection Type	[Azure Account Key | SAS Token] If set to 'Azure Account Key', the credential field 'Azure Account' will appear for configuration.

	If set to ‘SAS Token’, the credential field ‘SAS Token’ will appear for configuration.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
Container	Container in which the objects should be monitored
Prefix	A folder in a container is called prefix. In the field Prefix only the name of the folder needs to be provided no “/” after the folder name. If a prefix is provided only objects in the folder with the prefix name are listed in the output.
Blob	Blob to monitor. The task goes to status success, if the Blob is found. Unix filename pattern are supported to list only a selection of files: Supported wildcards are: • ? matches any single character • [seq] matches any character in seq • [!seq] matches any character not in seq • ”*” matches everything Example: Blob = test* : matches everything starting with test Blob = test[1-2].txt : matches test1.txt, test2.txt Blob = test[!1].txt: does not match test1.txt Blob = test?.txt: matches test1.txt, test2.txt etc.

Example for Azure Blob Storage Universal Tasks - Monitor Blob

The following Task monitors in the Container: *stonebranchpm* all Blob’s starting with the name *report*. If a Blob starting with the name *report* is found the task goes to task status *success*.


Azure-Blob Storage v0.1 Task Details: #2a Azure Monitor Blob - Linux-New Azure SDK - Account
Update
Copy
Launch Task
View Parents
Delete
Refresh
Close
Azure-Blob Storage v0.1 Task
Variables
Actions
Virtual Resources
Mutually Exclusive
Instances
General
Task Name :
#2a Azure Monitor Blob - Linux-New Azure SDK - Account
Version :
4
Task Description :
Member of Business Services :
Azure-Blob Samples
Resolve Name Immediately :
Time Zone Preference :
-- System Default --
Hold on Start :
Virtual Resource Priority :
10
Hold Resources on Failure :
Agent Details
Cluster :
Agent :
${AGT_LINUX}
Agent Variable :
Credentials :
stonebranch_os_user_london
Credentials Variable :
Run with Highest Privileges :
Interact with Desktop :
Azure-Blob Storage v0.1 Details
Action :
monitor-blob
Container :
stonebranchpm
Blob :
report*
Useproxy :
No
Loglevel :
DEBUG
Azure Account :
Azure-Storage-Account-Nils
Connection Type :
Azure Account Key
Prefix :
in/
Intervall :
10

Azure Data Factory Integration

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Disclaimer

This download is designed as a template to be adapted to your environment. In some cases, templates will need to be changed to work with your current Universal Automation Center (UAC) setup. This download is free to use. However, the download is not supported, and no warranty is provided by Stonebranch for this document and the related download. The use of this document and the related download is at your own risk. Before using this download in a production system, please perform testing.

Stonebranch assumes no liability for any issues caused by the performance of this download.

Request Support:

Stonebranch offers paid support, by request, for select Universal Tasks. Paid support provides installation and on-going technical support. Universal Tasks that are eligible for paid support will be noted as “support eligible” within the Universal Task listing page. To learn more, please contact Stonebranch.

Introduction

This Integration allows Stonebranch users to schedule, trigger, and monitor the Azure Data Factory pipeline process directly from Universal Controller.

Overview

- This integration uses Python modules azure-mgmt-resource and azure-mgmt-datafactory to make REST-API calls to Azure Data Factory.
- This integration will use the Azure Tenant id , Subscription id , client id ,client secret, Resource group, and location for authenticating the REST-API calls to Azure Data Factory.
- User can perform the following Azure Data Factory operations:
    - Run a Pipeline.
    - Get information on a Pipeline.

    - List all Pipelines.
    - Cancel Pipeline run.
    - List factory by resource group.
- Also, with respect to Azure Data Factory triggers, users can perform the following operations from UAC:
    - Start Trigger.
    - Stop Trigger.
    - List Trigger by Factory.
- UAC also can restart a failed pipeline either from the failed step or from any activity name in the failed pipeline.

Software Requirements

This integration requires a Universal Agent and a Python runtime to execute the Universal Task against an Azure Data Factory.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.4 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - azure-mgmt-resource
    - azure-mgmt-datafactory

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 6.6 and later with Python options installed.
- Universal Agent for Linux Version 6.6 and later with Python options installed.

Software Requirements for Universal Controller

- Universal Controller Version 6.6.0.0 and later.

Software Requirements for the Application to be Scheduled

This Universal Task has been tested with the Azure Data Factory Version 2.

Technical Considerations

- This integration uses the Python modules Azure resource Management Module and Azure Data Factory management to make REST-API calls with Azure Data Factory.
- Use Azure App Registration services to create an app, client ID, and client and associate it with Data Factory to provide appropriate roles (for example, Contributor).

Key Features

Feature	Description
Run a Pipeline	Execute a pipeline defined in Azure Data Factory. Schedule, trigger, and monitor the execution of a pipeline.

Get Information on a Pipeline	Get a information about the pipeline name .
List all Pipelines	List all pipelines that belongs to a Data Factory.
Cancel a Pipeline Run	Abort a Pipeline execution from UAC by providing the run ID for the Pipeline execution.
List Factory by resource group	List the available factory name that belongs to a resource group.
Start a Trigger	Start a trigger that will manage pipeline execution schedule in the Azure Data Factory.
Stop a Trigger	Stop a trigger that is in the Azure Data Factory.
List Trigger by Factory	List all the triggers that belongs to the Data Factory.

Import Azure Data Factory Integration Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Azure Data Factory Integration Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

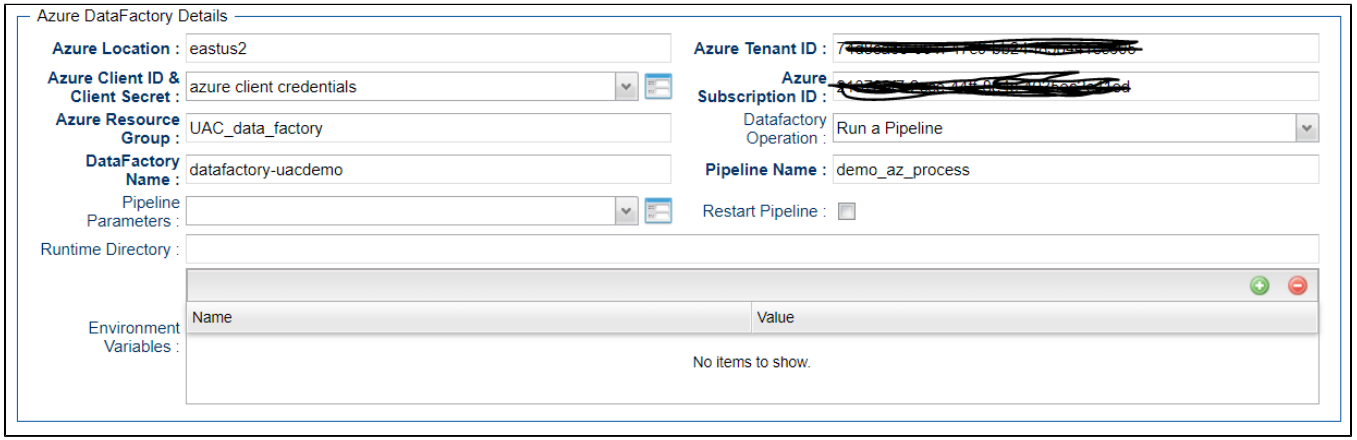
Field Descriptions for Azure Data Factory Integration Universal Task

Field	Description
Azure Location	Provide the Azure location.
Tenant ID	Provide the Azure Tenant ID or Directory ID.
Azure Client ID and Client Secret	Provide the Azure client ID and client secret (Client ID as user name and client secret as the password) - This comes from your Azure App registration services.
Subscription	Azure Subscription ID.
Azure Resource Group	Azure Resource group responsible for the Data Factory.
Data factory Operation	Select the required Azure Data Factory function for the task.
Data Factory Name	Provide the Azure Data Factory Name.
Pipeline Name	Pipeline name that needs to be executed in Azure Data factory.
Pipeline Parameters	Provide the pipeline run time parameters that needs to be passed for the pipeline execution.
Run ID	Run id for the Azure Data Factory Pipeline execution - Required in case of a restart.

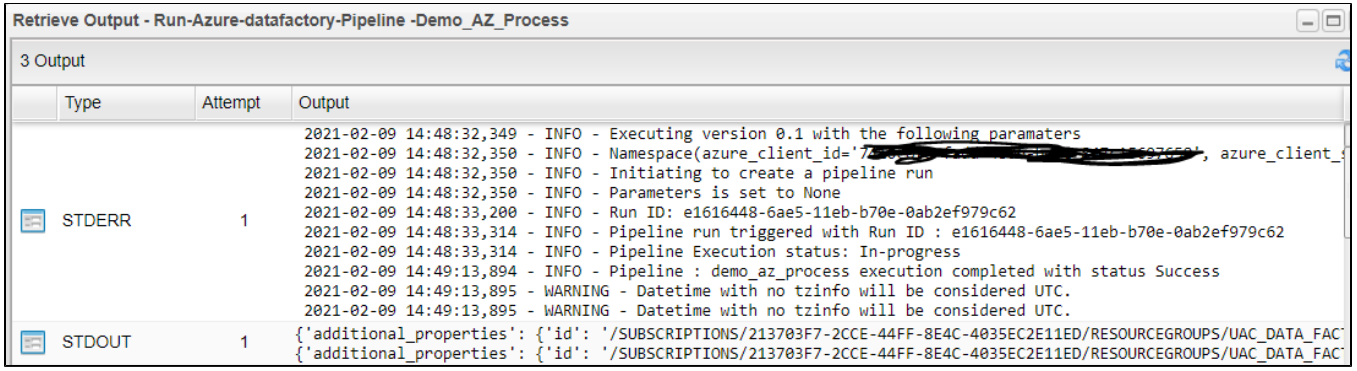
Restart Pipeline	Check if the pipeline execution needs to be restarted for a failure.
Start From Failure	Pipeline needs to be restarted from a Failure step.
Start Activity Name	If Start from Failure is not checked, specify if a failed pipeline needs to be restarted from a specific activity.
Run ID for Restart	Provide the Pipeline run ID for the restart.
Trigger Name	Trigger Name in the Azure Data Factory.
Polling	True for ARMPolling, False for no polling, or a polling object for personal polling strategy.

Examples for Azure Data Factory Integration Universal Tasks

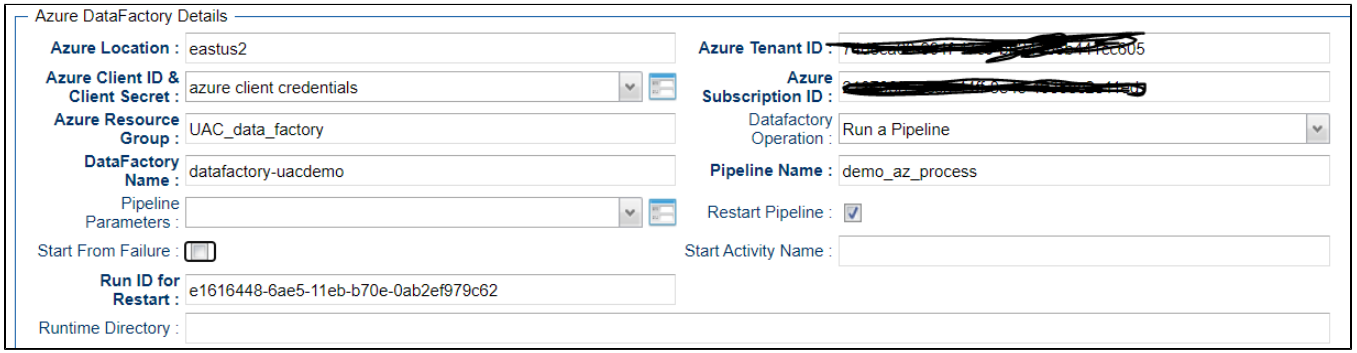
Run a Pipeline



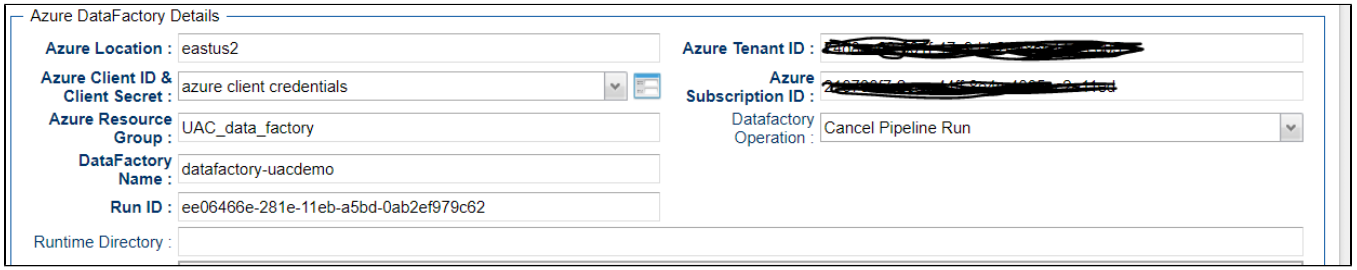
Pipeline Execution Logs



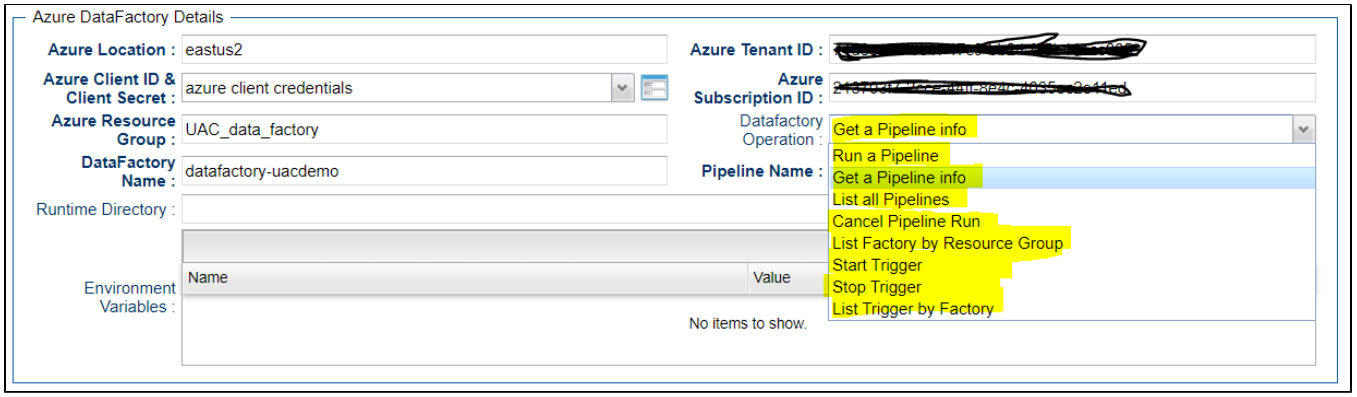
Restart a Failed Pipeline Execution



Cancel a Pipeline Run



Other Azure Data Factory Operation from UAC



Document References

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Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC69/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

Azure Logic Apps

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- Examples for Azure Logic apps Universal Tasks
  - Trigger a Azure Logic apps Workflow
  - Oauth2.0 Webservices Task - Refresh Access Token
  - Webservices Task Actions to Assign New Access Token to Global Variable
- Document References

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Introduction

This Universal Task can trigger and monitor the execution of Azure Logic workflows and retrieve the execution of Azure Logic workflow output. The Universal Controller integrates with Logic Apps through Rest-APIs securely through the Azure Oauth2.0 authentication mechanism.

Overview

- This task passes dynamic input parameters (JSON format) to each Azure Logic app workflow.
- The task triggers a workflow, monitors it until the process is completed, and then delivers the results to Universal Controller.
- Customers can manage and control Logic App workflow execution from Universal Controller, with the capability to employ other dependencies like time triggers or event-based jobs/workflows.
- This task offers ITSM integration capability, enabling the auto-creation of incidents in case of Logic Apps workflow execution failure.

Software Requirements

Software Requirements for Universal Template and Universal Task

Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.

- Python modules required
    - requests
- UAC Global Variables should be set in order to run the UT properly.
    - Global variable: Azure_access_token to be set with Azure access token and this will be used to make the REST-API calls authenticated from universal controller to Azure logic apps
    - Azure_Access_token can be populated with new access token by setting up a web services task that can run periodically; for example, every hour.

Software Requirements for Universal Agent

- Universal Agent for Windows x64 Version 6.5 and later with python options installed
- Universal Agent for Linux Version 6.5 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.4.7.0 and later

Software Requirements for the Application to be Scheduled

This Universal Task can schedule and execute Azure Logic Apps workflows with API Version 2016-06-01.

Azure Logic apps

This Universal Task can trigger and monitor the execution of Azure Logic workflows and retrieve the execution of Azure Logic workflow output. The Universal Controller integrates with Logic Apps through Rest-APIs securely through the Azure Oauth2.0 authentication mechanism.

Key Features

Feature	Description
Workflow Trigger Run	Trigger a logic apps workflow in Azure, monitor the execution, and pull the output results to Universal Controller.

Import Azure Logic apps Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.

4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Azure Logic apps Universal Task

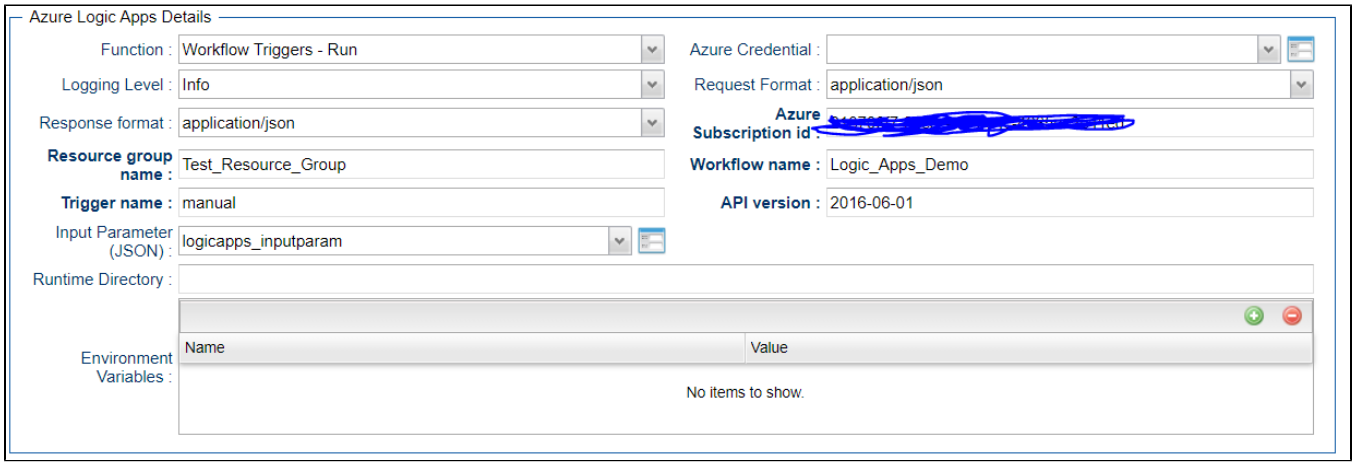
For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

Field Descriptions for Azure Logic apps Universal Task

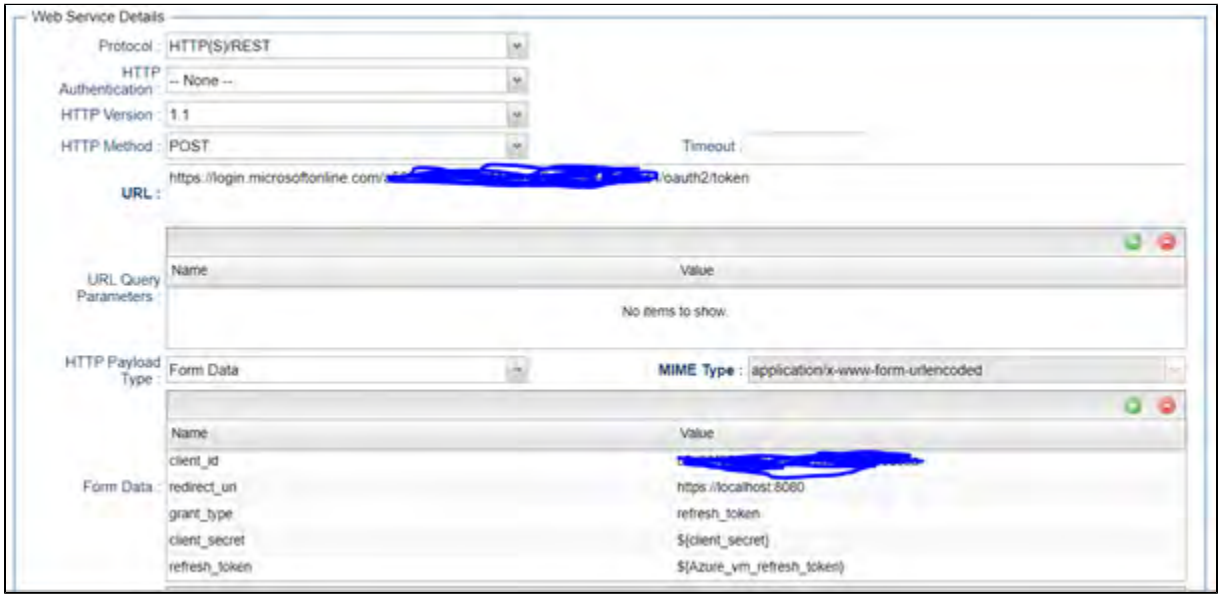
Field	Description
Function	Select the function for logic apps.
subscription Id	Azure Subscription ID.
Api-version	Provide the api version for Azure API.
Trigger Name	Should be set to “Manual“.
Workflow Name	Name of the Azure Logic Apps workflow.
Input Parameter	Run time input parameters(JSON) for the logic apps workflow.

Examples for Azure Logic apps Universal Tasks

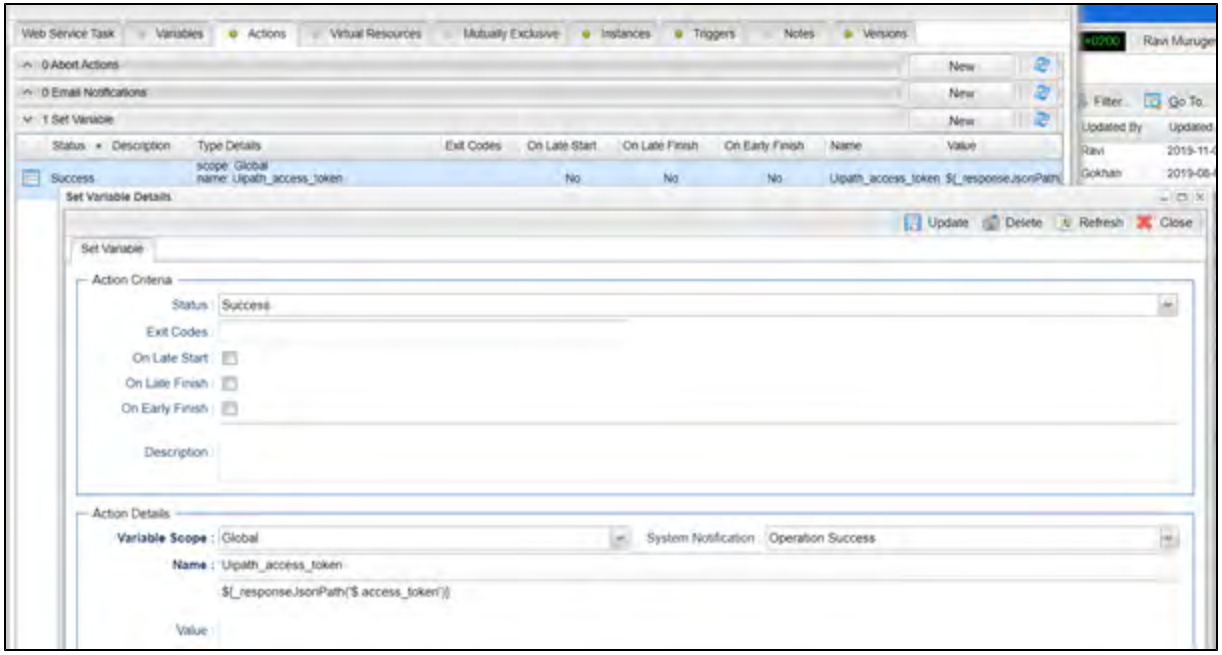
Trigger a Azure Logic apps Workflow



Oauth2.0 Webservices Task - Refresh Access Token



Webservices Task Actions to Assign New Access Token to Global Variable



Document References

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Azure Virtual Machines Start-Stop-Terminate-Instance

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  - Starting an Azure Virtual Machine from Universal Controller
  - List All Virtual Machines for an Azure Subscription
- Document References

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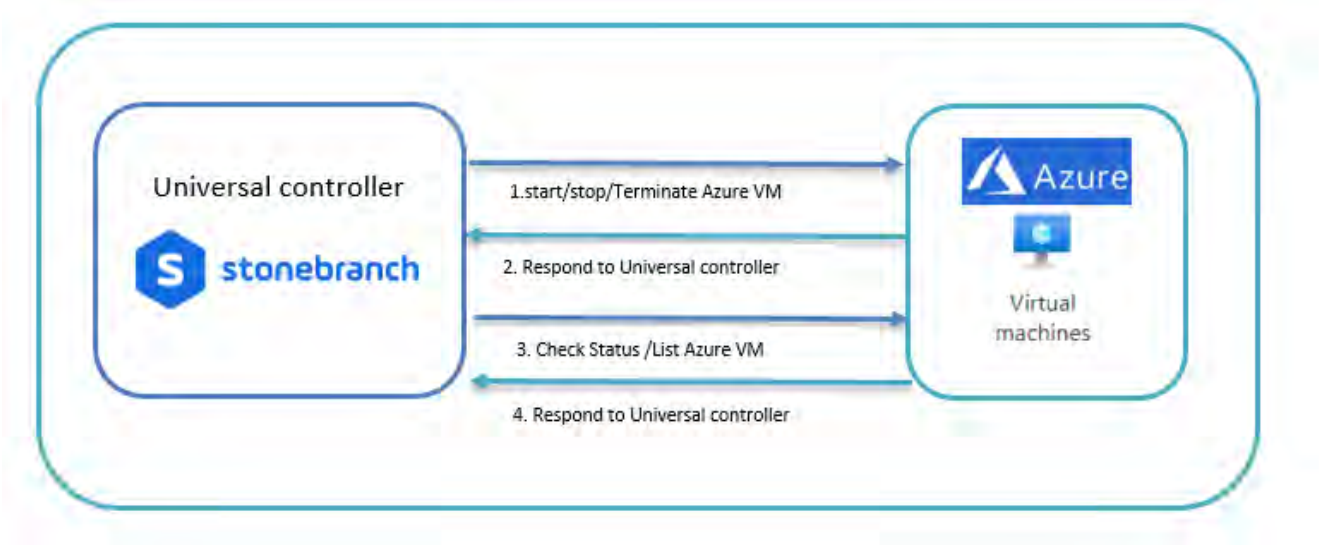
Introduction

This Universal Task enables users to utilize Azure Virtual Machine (VM) name, resource group, subscription ID, and access token as inputs for the start, stop, terminate, list, and check status of Azure VMs.

Overview

- This task uses python requests module to interact with the Azure cloud platform.
- It expands user ability to start/stop/terminate/check/list Azure VMs that belong to a subscription and resource group.
- In Universal Controller (UC), this task reaches and stays in the success state until the Azure instance is completely started, stopped, or terminated.
- Scheduling this task in Universal Controller with the right dependencies set up would start and stop EC2 instances based on business needs using a UC workflow.
- This task helps to dynamically manage VM operations. It could potentially reduce the Azure VM running cost in the cloud.



Software Requirements

This integration requires a Universal Agent and a Python runtime to execute the Universal Task against a Azure Virtual Machine.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.6 or higher . Tested with the Universal Agent bundled Python distribution.
- Python modules required
    - requests
- UAC Global Variables with azure oauth2.0 access should be set in order to run the UT properly.
    - Create a global variable and set the value of that with the Azure access token and this will be used in job definition to make the REST-API calls authenticated from universal controller to Azure logic apps
    - Access token can be populated with a new access token by setting up a web services task that can run periodically; for example, every hour.

Software Requirements for Universal Agent

- Universal Agent for Windows x64 Version 6.5 and later with python options installed
- Universal Agent for Linux Version 6.5 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.4.7.0 and later

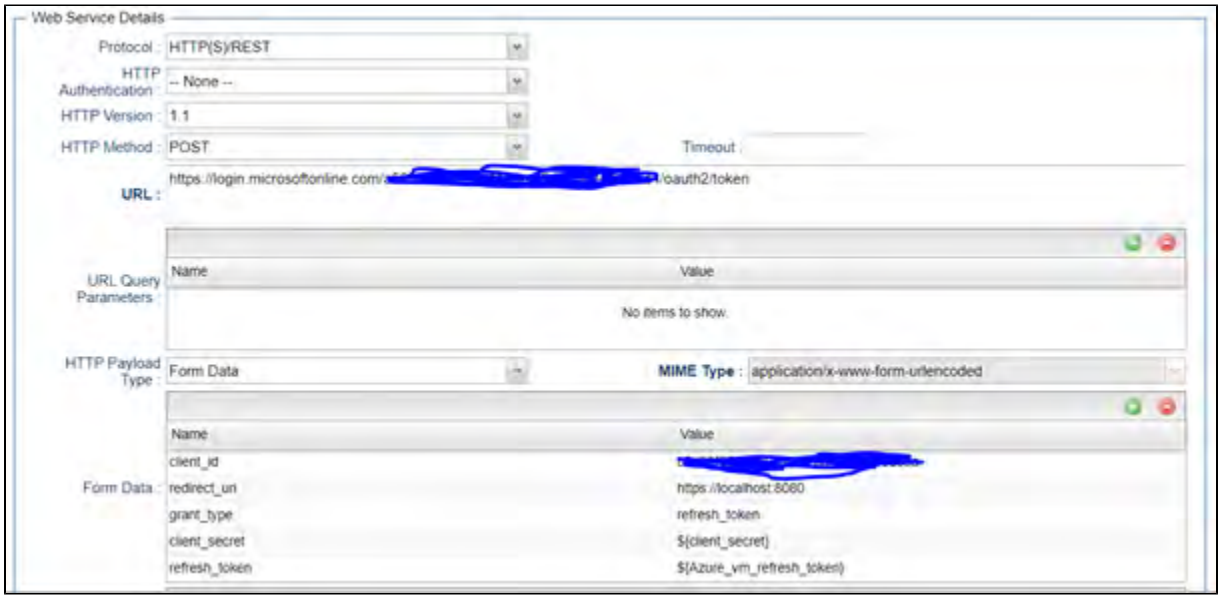
Software Requirements for the Application to be Scheduled

This Universal Task can schedule and execute Azure VM Operations with API Version 2019-12-01.

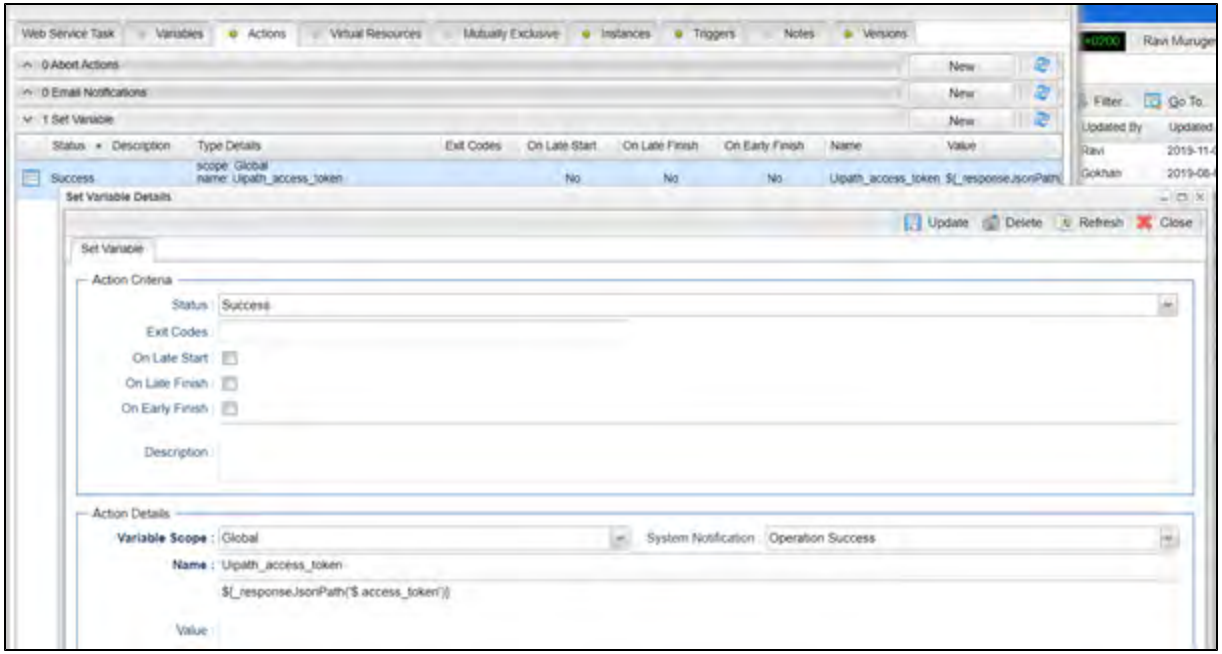
Technical Considerations

This task uses Azure Oauth2.0 access token for Azure API authentication. Users may need to use Universal Controller web services task to refresh the access token periodically.

Generate Access Token Using Sample webservice Task



Generated Access Token can be Stored in a Global Variable by Using the UAC Function for the Above webservices Task in Actions Set Variable



Azure Virtual Machines Key Features

Feature	Description
Start VM	Starts an Azure Virtual Machine
Stop VM	Stop an Azure Virtual Machine
Terminate VM	Terminate an Azure Virtual Machine
VM status	Check the status of an Azure Virtual Machine
List All VM	List the Azure VM's belongs to a subscription & Resource group

Import AWS Virtual Machine Start-Stop-Terminate Instances Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Azure Virtual Machine Start-Stop-Terminate Instances Universal Task

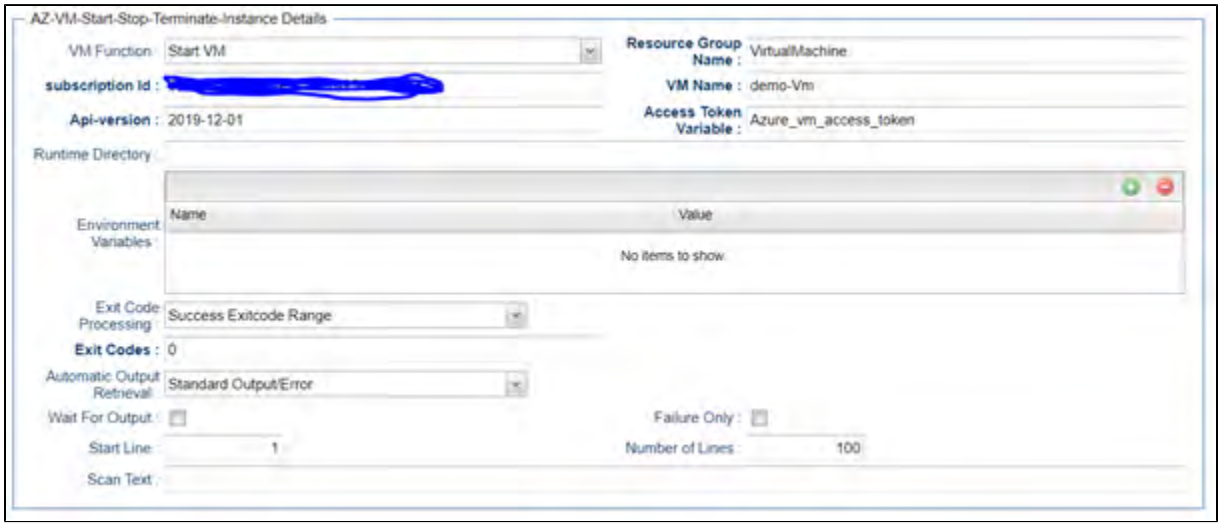
For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

Field Descriptions for Azure Virtual Machine Start-Stop-Terminate Instances Universal Task

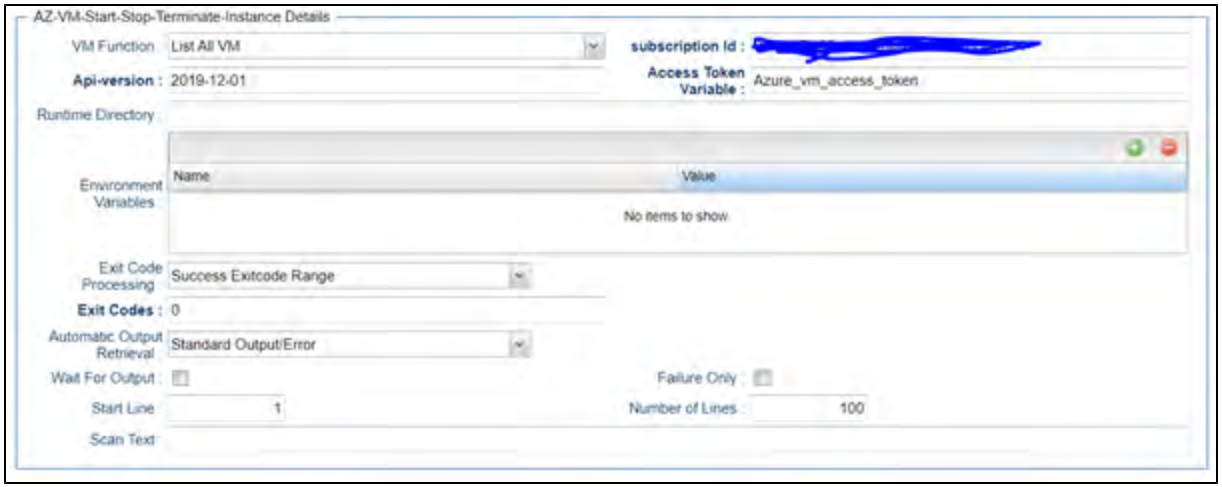
Field	Description
VM Function	Select the function to perform with the Azure VM , Either start or stop or terminate or check status or List VM's
Resource Group Name	Resource group name from the Azure Subscription
subscription Id	Azure Subscription ID
VM Name	Name of the Virtual Machine in Azure
Api-version	Api version in Azure
Access Token Variable	Bearer access that is store Universal controller global Variaböe

Examples for Azure Virtual Machine Start-Stop-Terminate Instances Universal Tasks

Starting an Azure Virtual Machine from Universal Controller



List All Virtual Machines for an Azure Subscription



Document References

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Container File Monitoring

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  - Software Requirements for the Application to be Scheduled
- Solution-pack Description
- Import Universal Template
- Configure Universal Task
- Field Descriptions for Container File Monitoring Universal Task
- Example for Container File Monitoring Universal Tasks
- Document References

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Introduction

This Universal Task and associated Task Templates provides a dynamic File Monitoring and File Transfer solution for containerized applications running in any container management solution (for example: OpenShift, Kubernetes).

Overview

For containers running a Universal Agent, or for application pods with a sidecar container running a Universal Agent, the container file system can be dynamically monitored and files automatically transferred from the container file system.

- Dynamically creates and enables an Agent File Monitor Trigger each time specific containers are started.
- Transfer files from the containers.
- Cleanup Agent File Monitor Triggers each time specific containers are stopped.

Software Requirements

This solution-pack requires a Universal Agent and a Python runtime to execute the Universal Task.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests version 2.22.0

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 7.0.0 and later with python options installed
- Universal Agent for Linux Version 7.0.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 7.0.0.0 and later

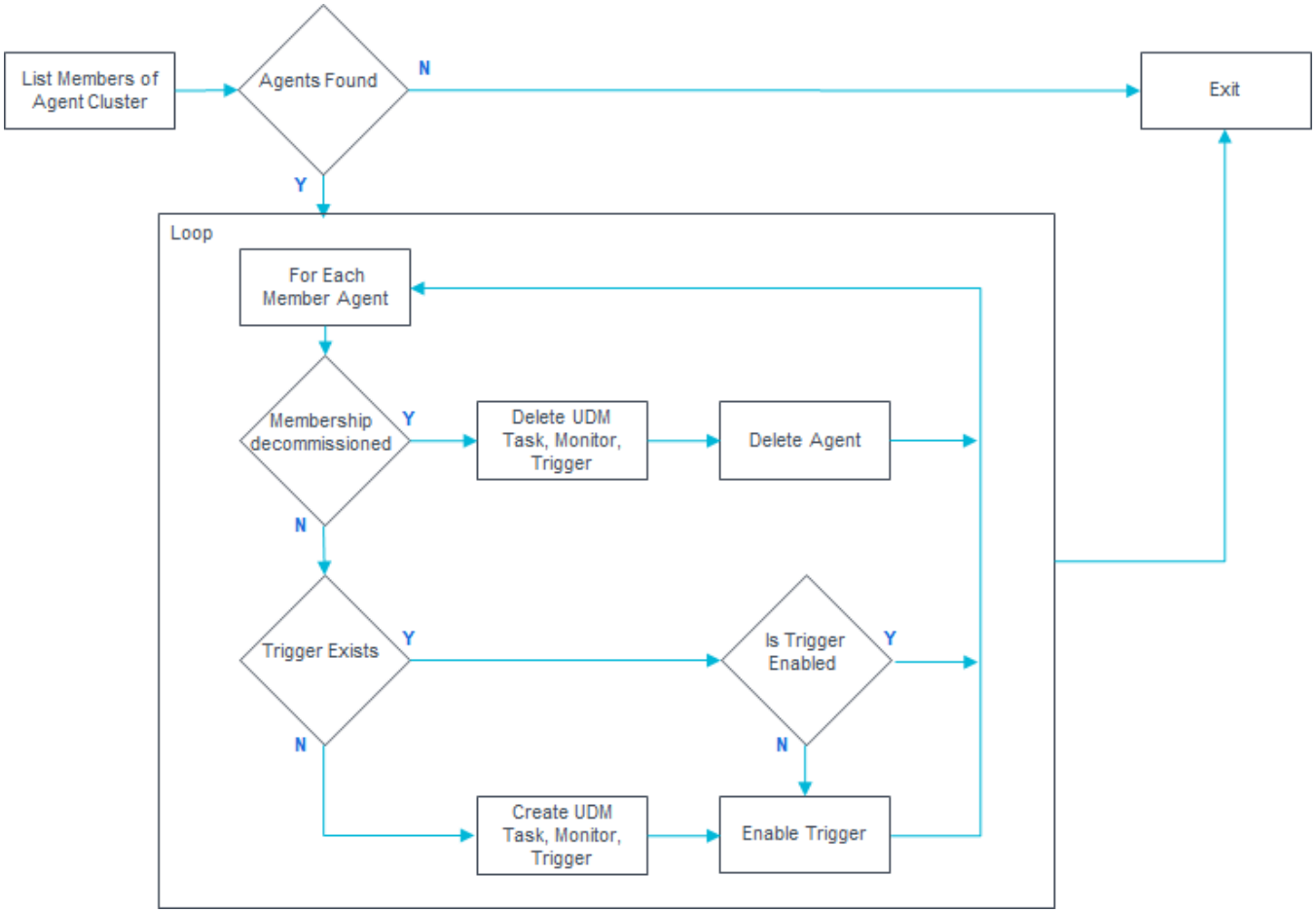
Software Requirements for the Application to be Scheduled

The requests Python module is used to make API call to a Universal Controller instance.

Solution-pack Description

Dynamic container File Monitoring and File Transfers can be achieved with this Universal Task and its associated Task Templates by simply configuring the containerized Universal Agents as Transient and ensuring that they register with a specific Agent Cluster.

Each time the Container File Monitor Universal Task runs, it lists the members of the specified Agent Cluster, and for each member Agent performs the functions detailed in the following flowchart.



Customers must make sure that the Universal Task is executed on a schedule that suits their requirements for how often they need to check whether new containerized Agents have been started or stopped.

This can be done by either:

- Simple Time Trigger based on the desired interval.
- Using a Recurring Task (requires Universal Controller 6.9.x or higher) to provide a loop function.

Import Universal Template

To use the Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.

2. Download the provided ZIP file.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Click Import Template.
5. Select the template ZIP file and Import.

When the template has been imported successfully, the Universal Template will appear on the list. Refresh your Navigation Tree to see these tasks in the Automation Center Menu.

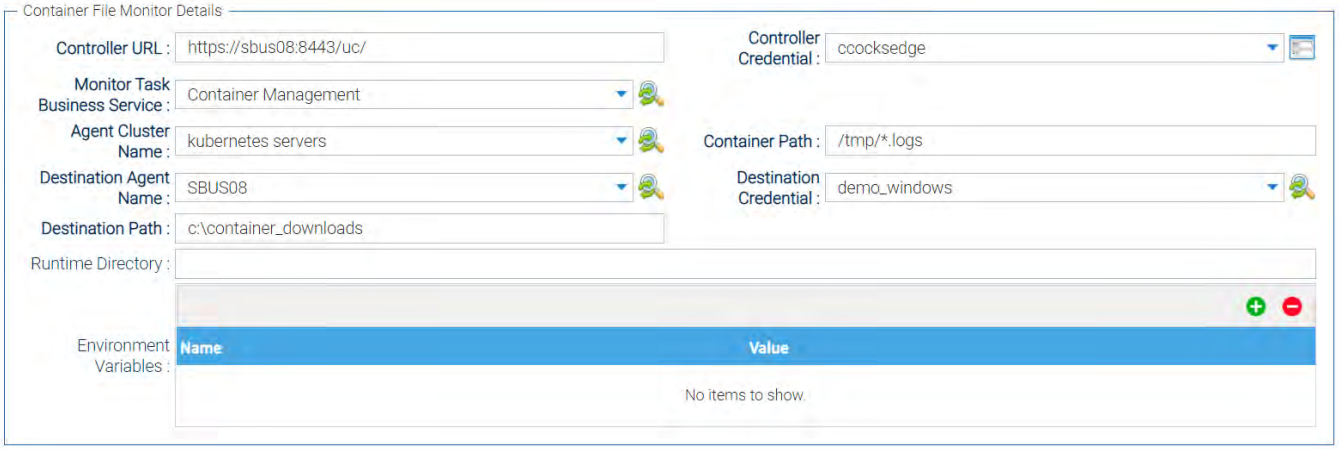
Configure Universal Task

Create a Container File Monitor Universal Task for each Agent Cluster.

Field Descriptions for Container File Monitoring Universal Task

Field	Description
Controller URL	Universal Controller URL; that is: https://localhost:8443/uc
Controller Credential	Universal Controller Credential, specified user will need the following access rights: • Read Access to the specified Agent Cluster • Ability the delete the container Agents • Ability to Create, Enable, Disable and Delete Agent File Monitors, File Transfer Tasks, and Agent File Monitor Triggers that are members of the Business Service specified in the Monitor Task Business Service field.
Monitor Task Business Service	Business Service required for the generated UDM File Transfer Task, Agent File Monitor Task, and Agent File Monitor Trigger definitions.
Agent Cluster Name	Agent Cluster to Monitor.
Container Path	Path on the Container to Monitor; that is `/tmp/*.txt` or `/tmp`. This value is passed to the template Agent File Monitor Task
Destination Agent Name	Destination Agent for the UD File Transfer. This value is used in the generated UDM File Transfer Task.
Destination Credential	Destination Credential for File Transfer. This value is used in the generated UDM File Transfer Task.
Destination Path	Destination Path for File Transfer. This value is used in the generated UDM File Transfer Task.

Example for Container File Monitoring Universal Tasks



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Databricks

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- Examples for Databricks Integration Universal Tasks
  - Run now Job
  - Run Submit Job
  - List Cluster
  - Upload Local File to DBFS
- Document References

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Introduction

This Universal Task allows Stonebranch users to perform end-to-end Orchestration and Automation of Jobs & Clusters in Databricks environment, either in AWS or Azure.

Overview

- This task will use the Databricks URL and the user bearer token to connect with the Databricks environment.
- Users can perform the following with respect to the Databricks jobs.
  - Create and list jobs
  - Get job details
  - Run now jobs
  - Run submit jobs

    - Cancel run jobs
- Also with respect to Databricks clusters, this Universal Task can perform the following operations:
    - Create, start and restart a cluster
    - Terminate a cluster
    - Get a cluster info
    - List clusters
- With respect to Databricks DBFS , this Universal Task also provides a feature to upload larger files.

Software Requirements

This integration requires a Universal Agent and a Python runtime to execute the Universal Task against a Databricks environment.

Software Requirements for Universal Template and Universal Task

Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.

- Python modules required
    - requests

Software Requirements for Universal Agent

- Universal Agent for Windows x64 Version 6.6 and later with Python options installed
- Universal Agent for Linux Version 6.6 and later with Python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.6.0.0 and later

Software Requirements for the Application to be Scheduled

This Universal Task has been tested with the Azure Databricks environment -API version 2.0.

Technical Considerations

- This task uses Python modules requests to make REST-API calls to the Databricks environment.
- Databricks URL and user bearer token would be required as basic input for this Universal Task.
- Please refer to the Databricks API related to jobs and clusters in URL: https://docs.Databricks.com/dev-tools/api/latest/

Key Features

Feature	Description
Create Job	Create a job in a Databricks environment from Universal Controller. Here, a JSON input for job creation in Databricks environment will be used.

List jobs	List the jobs available within the Databricks environment.
Get Job details	Provides an existing job definition in Databricks by providing the job ID as input.
Run now Jobs	This feature helps to run an existing job in Databricks environment using the run time input parameters supplied in JSON from the universal task and the Universal Controller will be monitoring the execution of the job until it gets completed.
Run Submit jobs	This feature helps to run a job in Databricks environment that can be dynamically defined in JSON as an input parameter in the Universal Task and the Universal Controller will be monitoring the execution of the job until it gets completed.
Cancel Run job	Cancel a execution of job that is in running state within the Databricks environment.
Create Cluster	Create a cluster in Databricks environment. Input to be provided in the JSON in a script in this Universal Task.
List clusters	List the clusters available in the Databricks environment.
Start cluster	Start a cluster that is in stopped state in Databricks.
Restart cluster	Restart a cluster in the Databricks environment.
Terminate cluster	Terminate cluster in Databricks environment by providing cluster ID as input.
Get a Cluster info	Provides the definition of an existing cluster in Databricks environment in JSON.
Upload file to DBFS	Upload a file from local server to a Databricks file system DBFS.

Import Databricks Integration Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Databricks Integration Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

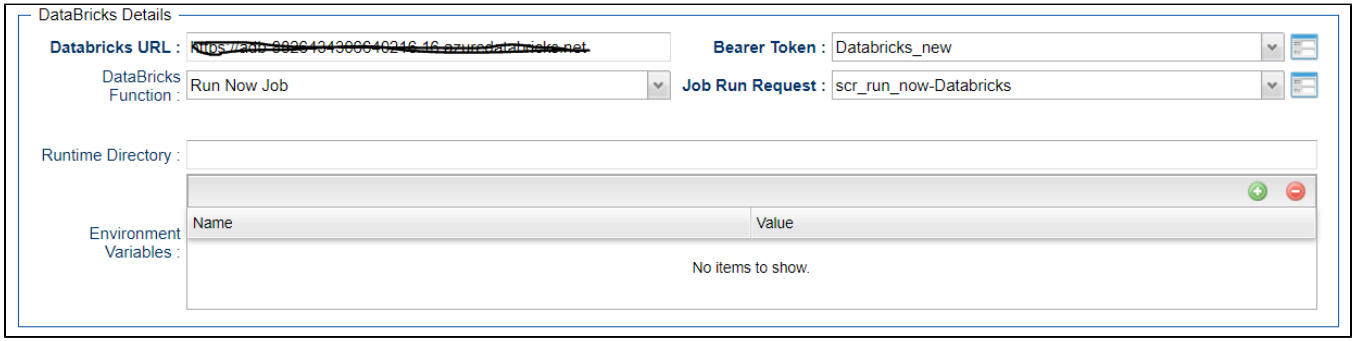
Field Descriptions for Azure Logic apps Universal Task

Field	Description
Databricks URL	Specify the Databricks URL.
Bearer Token	Provide the Databricks Personal token or the Azure AD token.

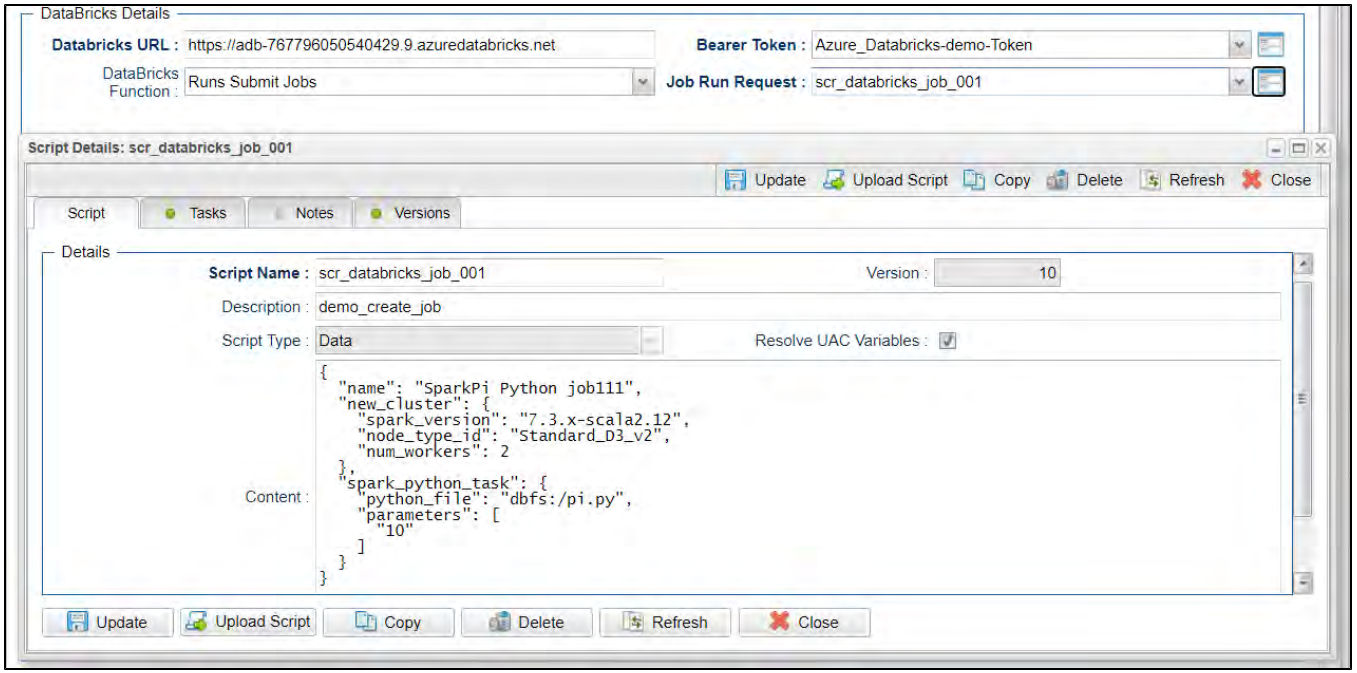
Databricks Function	Select a Function that would like to perform with Databricks.
Create Request Script	Feed the script for the new job creation or cluster in Databricks.
Job ID	Provide the Databricks Job ID.
Job Run Request	Specify the parameters for Jar or notebook or python or spark-submit or the Job submit run request.
Run ID	Specify the Databricks Run ID.
Cluster ID	Provide the cluster ID.
Local file name	Local file name with path.
DBFS file name	Provide the Databricks file path and name.
overwrite	Specify if the uploaded files need to overwritten in DBFS.

Examples for Databricks Integration Universal Tasks

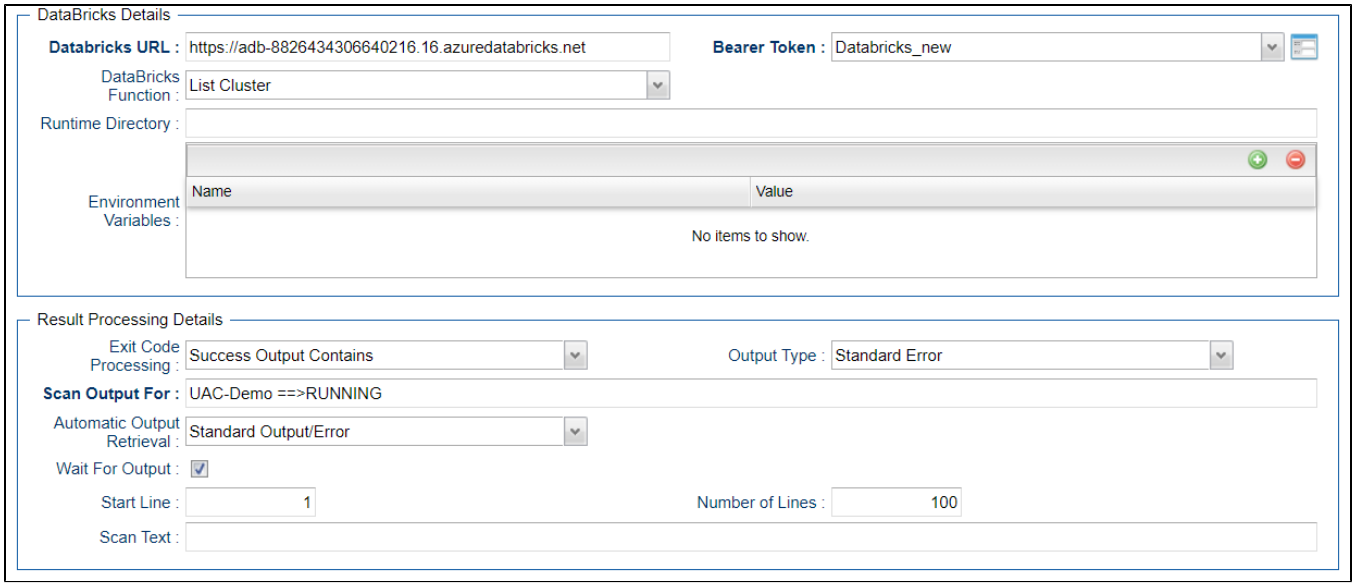
Run now Job



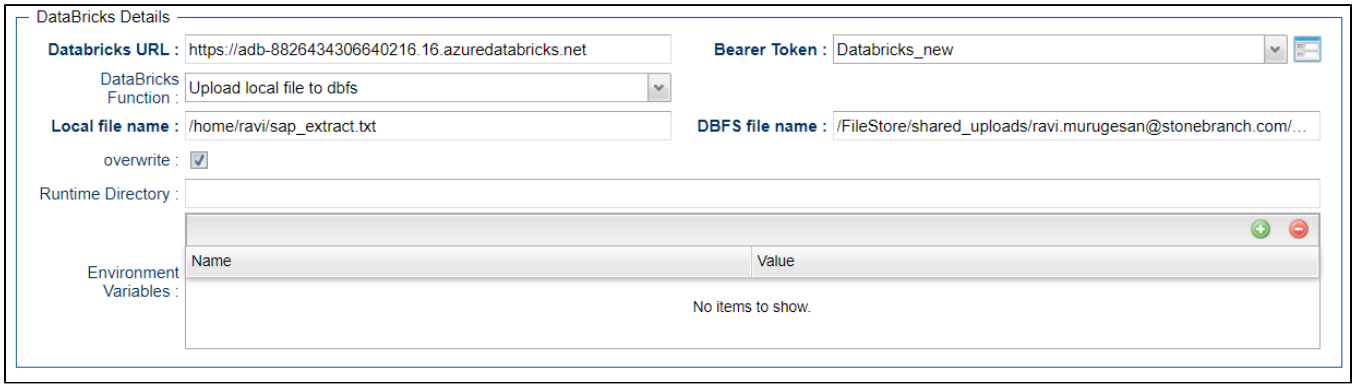
Run Submit Job



List Cluster



Upload Local File to DBFS



Document References

This document references the following documents:

Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

GitHub

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- Universal Task for GitHub Details
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- Configure GitHub Universal Task
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    - Export Universal Objects from UAC to GitHub
    - Import Universal Objects from GitHub to UAC
    - Export Universal Objects from UAC to Script
    - Import Universal Objects from Script to UAC
        - JSON Script that Defines Universal Template SQL

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Introduction

This Universal Task allows you to perform server operations, such as importing/exporting Universal Automation Center objects and integrating with GitHub; for example, you could import a new Universal Template from GitHub into your Universal Controller.

It also allows you to import/export Universal Automation Center objects using the Universal Controller script library.

Software Requirements

Software Requirements for Universal Agent and Universal Controller

- Universal Agent for Linux or Windows Version 6.9.0.0 or later are required.
- For Universal Agent 6.9.0.0, the PyGitHub python module must be installed.

Software Requirements for Universal Controller

- Universal Controller 6.9.0.0 or later.

Software Requirements for the Application to be Scheduled

- A GitHub Account with a GitHub token is required,

A GitHub token can be created under GitHub / Settings / Developer settings / Personal access tokens

Universal Task for GitHub Details

Import	Import any Universal Controller objects such as tasks, calendar, scripts, and trigger from GitHub into Universal Controller; for example, import a new Universal Template in the Marketplace from GitHub to Universal Controller.
Import	Import any Universal Controller object such as Universal Template, tasks, calendar, scripts, and triggers from a script file into Universal Controller; for example, no Internet connection from Universal Controller to GitHub is supported.
Export	Export any Universal Controller object such as tasks, calendar, scripts, and triggers to GitHub from Universal Controller; for example, export a Universal Template to a GitHub repository.
Export	Export any Universal Controller object such as tasks, calendar, scripts, and triggers to a script object, so that the content of the script later can be used to import it on a Controller without needing the UAC import functionality.
Support	Support Stonebranch SaaS Universal Controller and on-premise Universal Controller customers.

Import GitHub Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure GitHub Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

Field Descriptions for the GitHub Integration Universal Task

Field	Description
Universal Controller URL	Universal Controller URL; for example, Local Universal Controller: http://192.168.88.10:8080/uc/ Stonebranch SaaS Cloud Universal Controller: https://superstore.stonebranchdev.cloud/
Universal Controller Credentials	Credentials of the Universal Controller Webservice API
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
UAC Base URL	The REST API URL for UAC. for example, http://192.168.88.40:8080/uc
UAC REST Credentials	The REST API credentials for UAC.
Operation Type	Operation Type can be one of the following: • **From UAC to GitHub** This operation gets the universal object information from UAC and sends it into GitHub repository. See Export Universal Objects from UAC to GitHub. • **From GitHub to UAC** This operation gets the universal object information from GitHub repository and sends it into UAC. It either creates these or updates the already existing ones. See Import Universal Objects from GitHub to UAC. • **UAC_to_Script** This operation gets the universal object information from UAC and exports it into a UAC script object, so that later the content of the script can be used to import it on a Controller without needing to the UAC import functionality. See Export Universal Objects from UAC to Script. • **Script_to_UAC** This operation gets the universal object information from UAC script and sends it into UAC. It either creates these or updates the already existing ones. See Import Universal Objects from Script to UAC.
Object Type	Object Types in UAC: [agent | agentcluster | businessservice | calendar | customday | credential | databaseconnection | emailconnection | peoplesoftconnection | sapconnection | task | trigger | script | virtual | variable | universaltemplate]
Object Sub Type	The type of the selected object. Refer to Task Types in the Product Documentation; for example, For Object Type tasks: Workflow, Timer, Windows, Linux/Unix, z/OS, …
Business Services	Comma Separated List of Business Services
GitHub Base URL	Should be filled in order to use local/own/private GitHub server. For GitHub please leave empty.
GitHub Token	Connection token for GitHub. Can be generated under GitHub / Settings / Developer settings / Personal access tokens
Repository Path	GitHub repository ; for example, stonebranch-marketplace/ut-sql-tasks used to: • Export Universal Package to GitHub • Import Universal Package from GitHub

Branch	Branch name ; for example, main, development
Task Folder Name	Folder name of the task to be put under the Branch; for example, export
Change Message	Commit definition. ${ops_execution_user}_${ops_agent_name}_app.version_%s_${ops_launch_time}_change_ is added in front of the message; for example, if Change Message field left empty: nbuer_AGT_LINUX_PS4_app.version_1.3_2021-01-20 10:25:48 +0000_change_ if Change Message field = “dev” nbuer_AGT_LINUX_PS4_app.version_1.3_2021-01-20 10:25:48 +0000_change_dev

Naming Conventions

The naming of the objects that are exported to a GitHub are as follows:

<Object Name**>.<**Object Type**>.<**Object Sub Type**>.json**

;for example, AWS Task.task.SAP.json

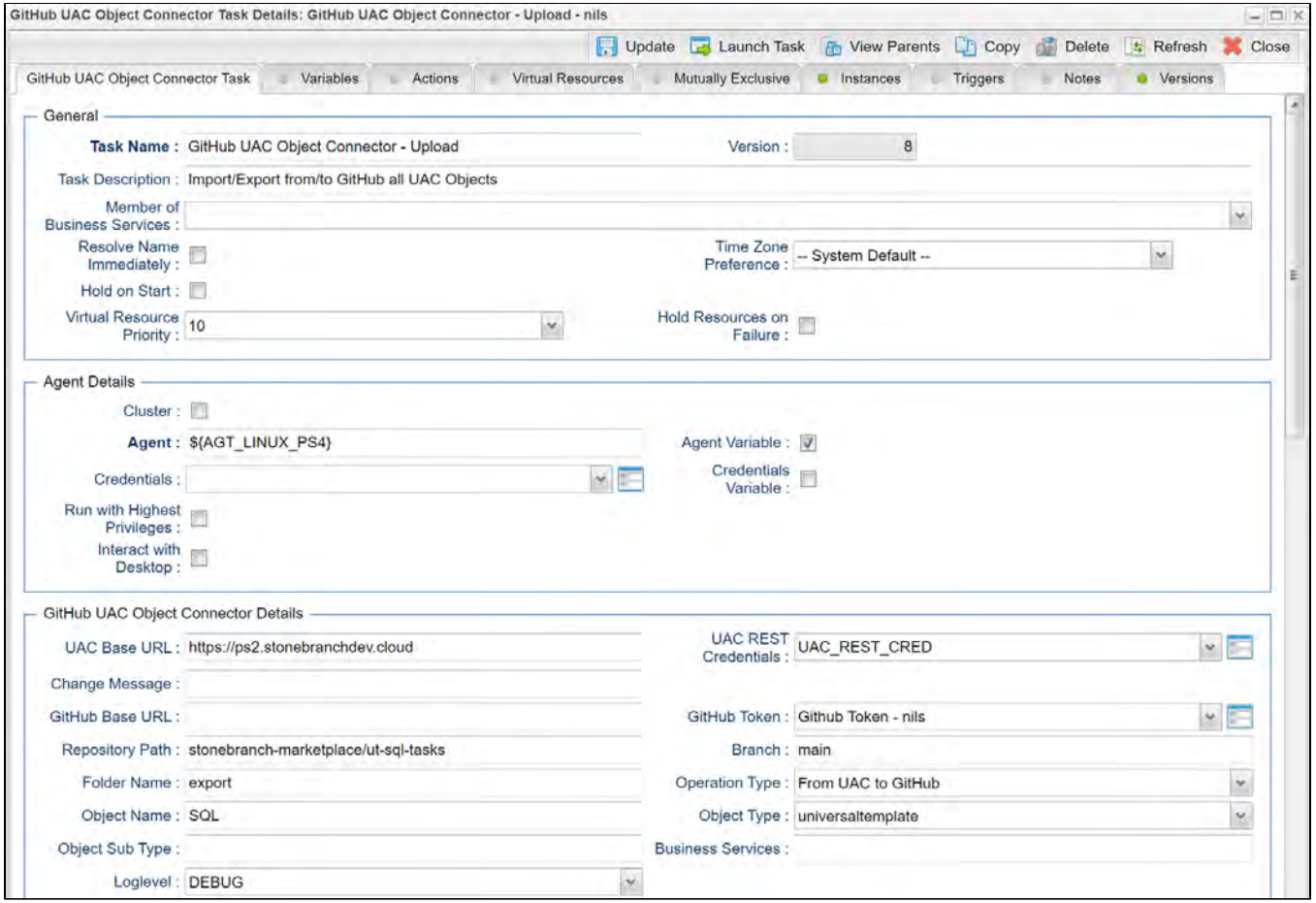
If there is no Object Sub Type, then:

;for example, AWS Task.universaltemplate.json

Examples for GitHub Universal Tasks

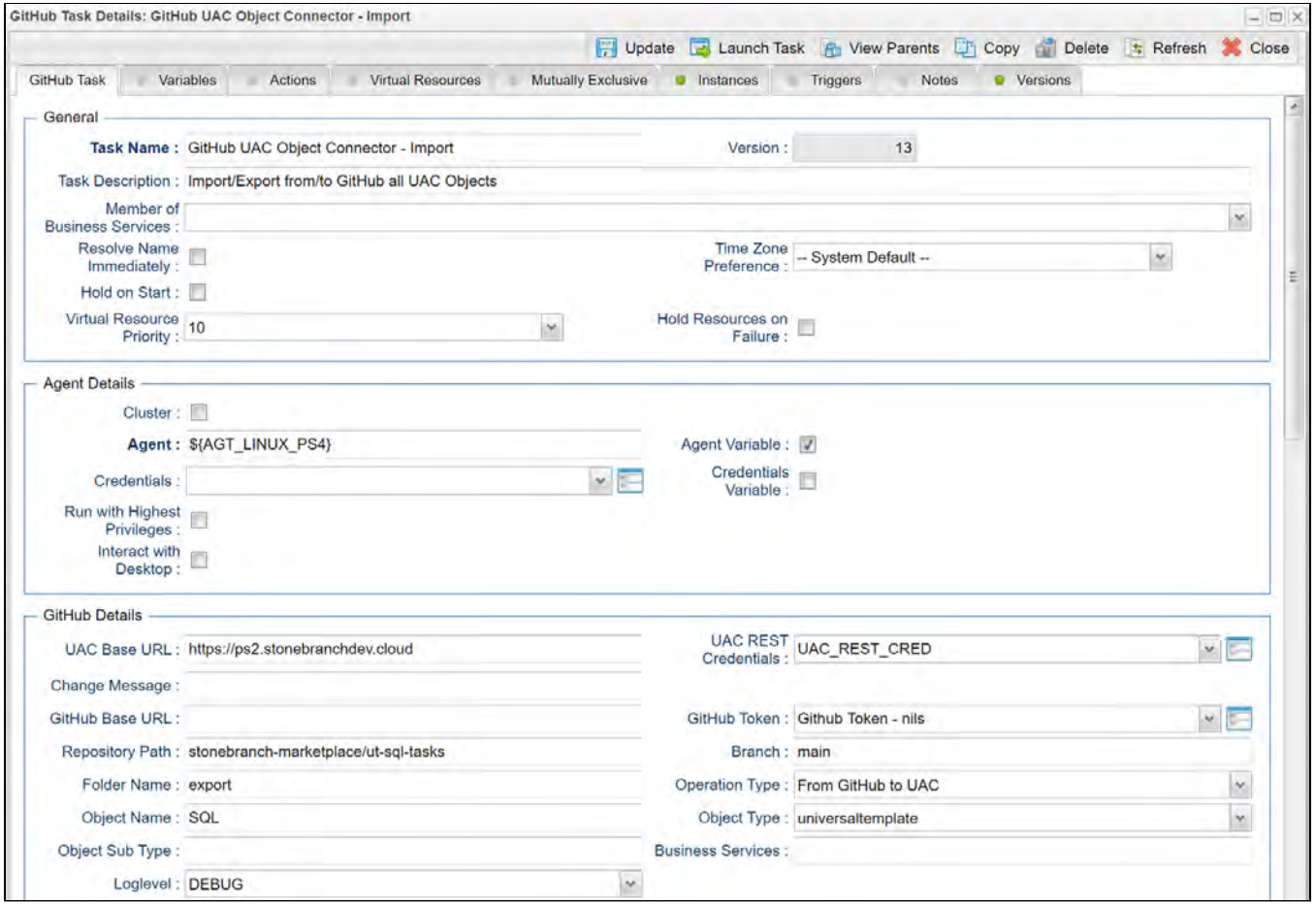
Export Universal Objects from UAC to GitHub

The following task exports the Universal Template **SQL** from Universal Controller to the main branch of the GitHub repository: **stonebranch-marketplace/ut-sql-tasks; folder: export**



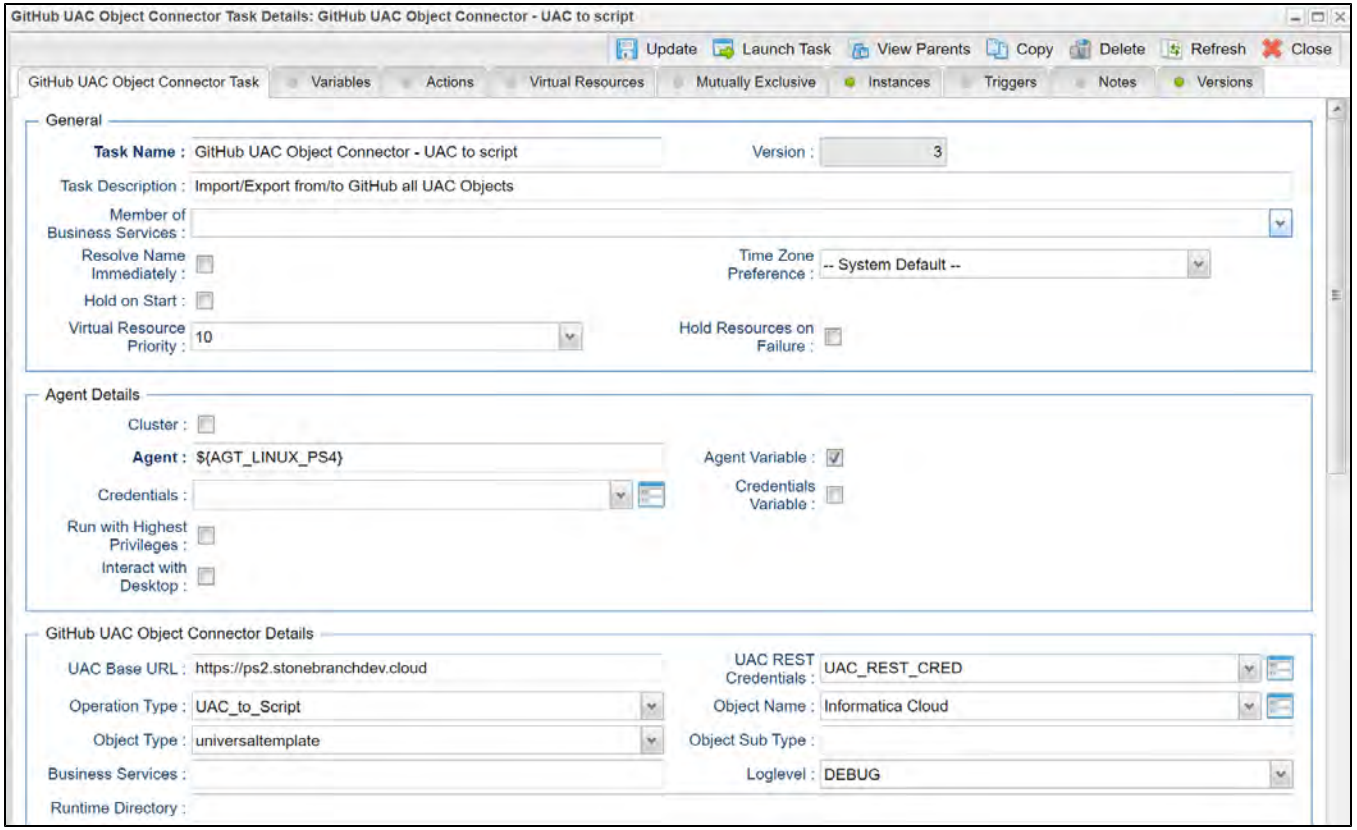
Import Universal Objects from GitHub to UAC

The following Task imports the universal template **SQL** from the main branch of the GitHub repository: **stonebranch-marketplace/ut-sql-tasks; folder export**



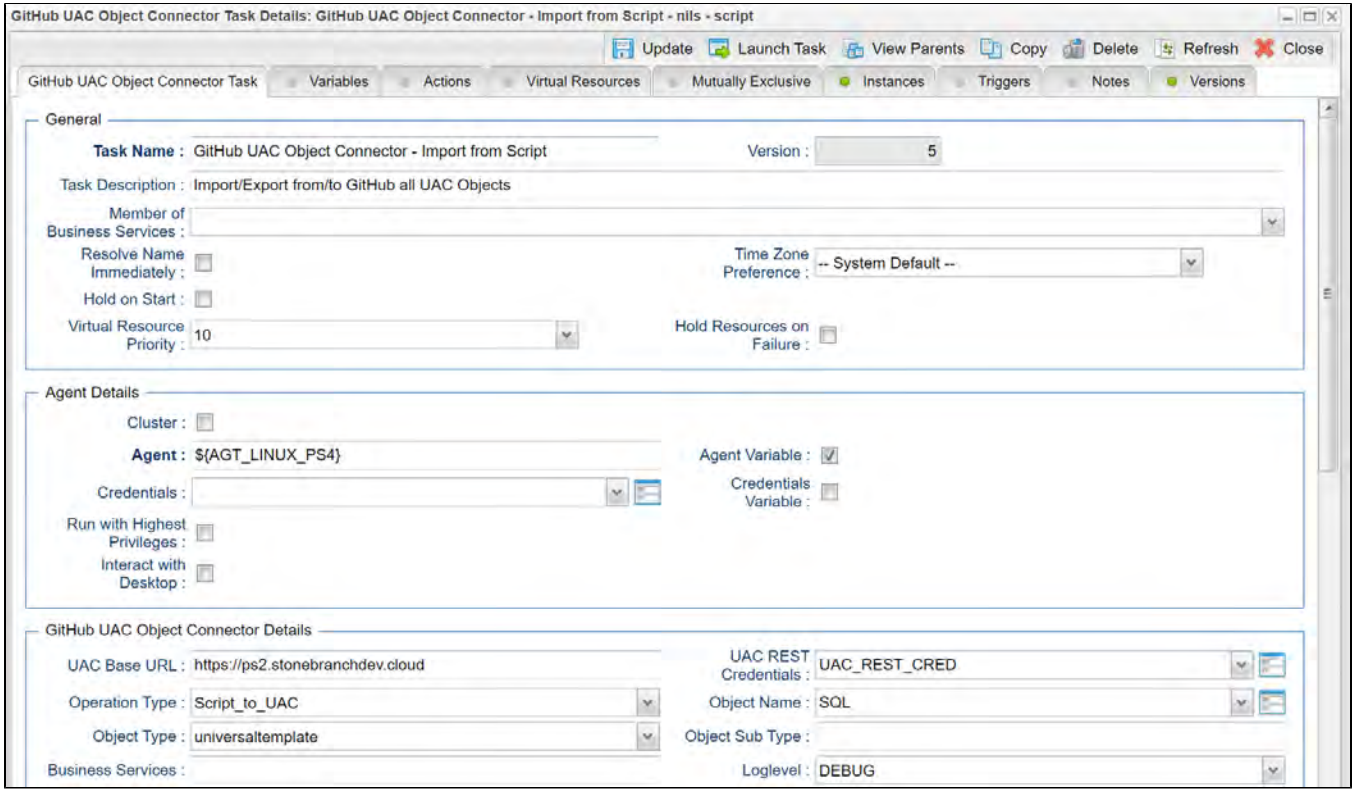
Export Universal Objects from UAC to Script

This task gets the object for the Universal Template “Informatica Cloud” from UAC and exports it into a UAC script object with the same name, so that later the content of the script can be used to import it on a Controller without needing the UAC import functionality.

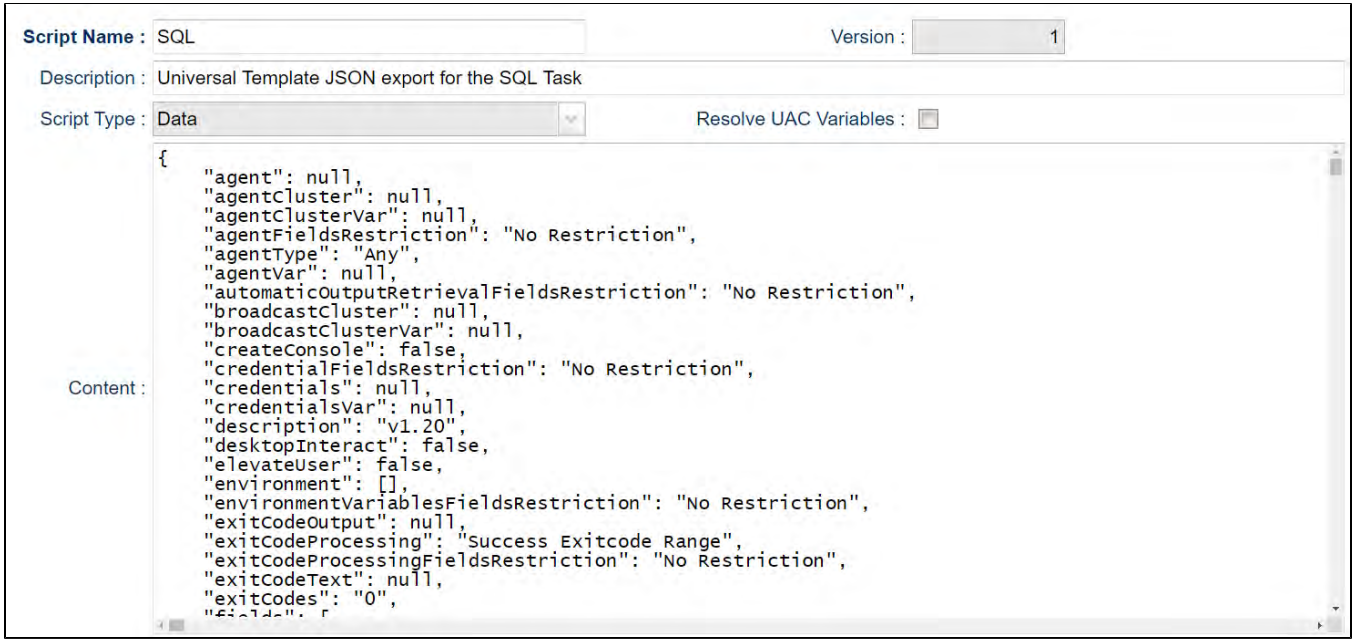


Import Universal Objects from Script to UAC

The following task imports the Universal Template as defined in the JSON script named **SQL.**



JSON Script that Defines Universal Template SQL


Script Name : SQL
Version : 1
Description : Universal Template JSON export for the SQL Task
Script Type : Data
Resolve UAC Variables :
Content :
{
"agent": null,
"agentCluster": null,
"agentClusterVar": null,
"agentFieldsRestriction": "No Restriction",
"agentType": "Any",
"agentVar": null,
"automaticOutputRetrievalFieldsRestriction": "No Restriction",
"broadcastCluster": null,
"broadcastClusterVar": null,
"createConsole": false,
"credentialFieldsRestriction": "No Restriction",
"credentials": null,
"credentialsVar": null,
"description": "V1.20",
"desktopInteract": false,
"elevateUser": false,
"environment": [],
"environmentVariablesFieldsRestriction": "No Restriction",
"exitCodeOutput": null,
"exitCodeProcessing": "Success Exitcode Range",
"exitCodeProcessingFieldsRestriction": "No Restriction",
"exitCodeText": null,
"exitCodes": "0",

Google BigQuery

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Introduction

This Universal Task allows Stonebranch users to schedule, trigger, monitor, and orchestrate the Google BigQuery process directly from Universal Controller.

Overview

- This task uses Python modules google-cloud-bigquery and google-auth to make REST-API calls to Google BigQuery
- This task will use the GCP Project ID, BigQuery SQL or Schema, Dataset ID, Job ID, Location, Table ID, Cloud Storage URI, and Source File Format as parameters of BigQuery function, and GCP KeyFile (API KEY) of Service account for authenticating the REST-API calls to Google BigQuery.

- User can perform the following Google BigQuery operations:
    - BigQuery SQL
    - List dataset
    - List tables in dataset
    - View job information
    - Create a dataset
    - Load local file to a table
    - Load cloud storage data to a table
    - Export table data

Software Requirements

This Universal Task requires a Universal Agent and a Python runtime to execute the Universal Task against a Google BigQuery data warehouse.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.4 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - google-cloud-bigquery
    - google-auth

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 6.6 and later with Python options installed.
- Universal Agent for Linux Version 6.6 and later with Python options installed.

Software Requirements for Universal Controller

- Universal Controller Version 6.6.0.0 and later.

Software Requirements for the Application to be Scheduled

This Universal Task has been tested with the Google BigQuery data warehouse.

Technical Considerations

- This Universal Task uses the Python modules Google auth and Google BigQuery management to make REST-API calls with Google BigQuery
- Create a service account in your GCP identity management

Key Features

Feature	Description

BigQuery SQL	Runs a BigQuery SQL query and returns query results.
List dataset	Lists all existing datasets in a particular project.
List tables in dataset	List tables in a particular dataset.
View job information	Retrieve the information of a job for a given job ID.
Create a dataset	Create a dataset within a project.
Load local file to a table	Load a local file to a BigQuery table.
Load cloud storage data to a table	Load a file form cloud storage to BigQuery table.
Export table data	Export table to cloud storage bucket.

Import Google BigQuery Integration Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Google BigQuery Integration Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

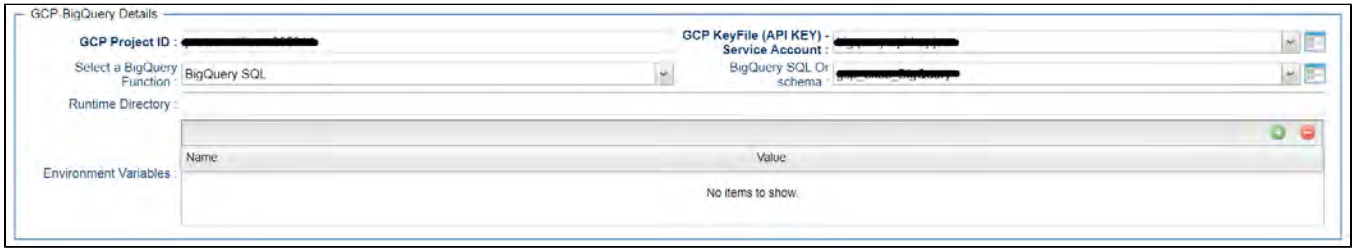
Field Descriptions for Google BigQuery Integration Universal Task

Field	Description
GCP Project ID	Provide Google Cloud Platform (GCP) project ID.
GCP KeyFile (API KEY) Service account	Provide Google Cloud Platform Service account authentication key in JSON format.
Select a BigQuery Function	Select a function for execution in GCP.
BigQuery SQL or Schema	Provide BigQuery SQL or schema as applicable for function to load data either from cloud or local storage.
Dataset ID	Provide GCP Dataset ID (name of the dataset) - Must be alphanumeric.
Job ID	Provide BigQuery Job ID.
Location	Provide GCP BigQuery location.
Table ID	Provide table ID(Name of the table where the file needs to be loaded).

Cloud Storage URI	Provide URI for the cloud storage.
Source File Format	Provide source file format for the data load in to table.
Local File Path	Provide local file path for the data load in to a table.
Header Row to Skip	Provide an integer indicating the number of header rows in the source data.
Schema Auto Detect	Option to enable schema auto detection when loading data applicable only for JSON and CSV format.

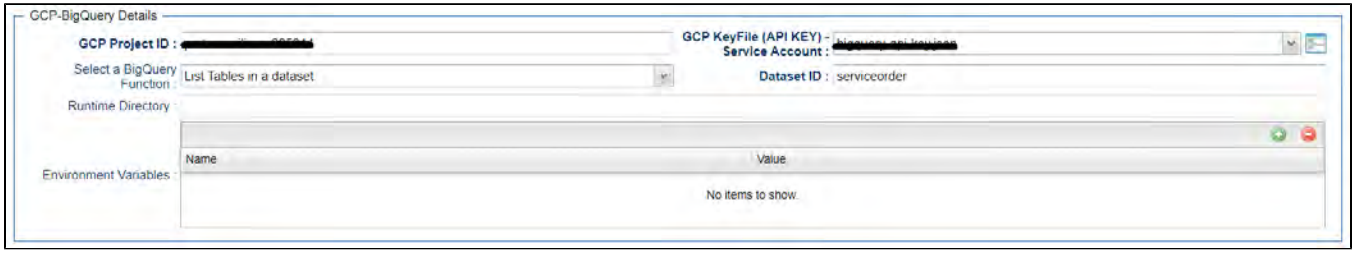
Examples for Google BigQuery Integration Universal Tasks

BigQuery SQL

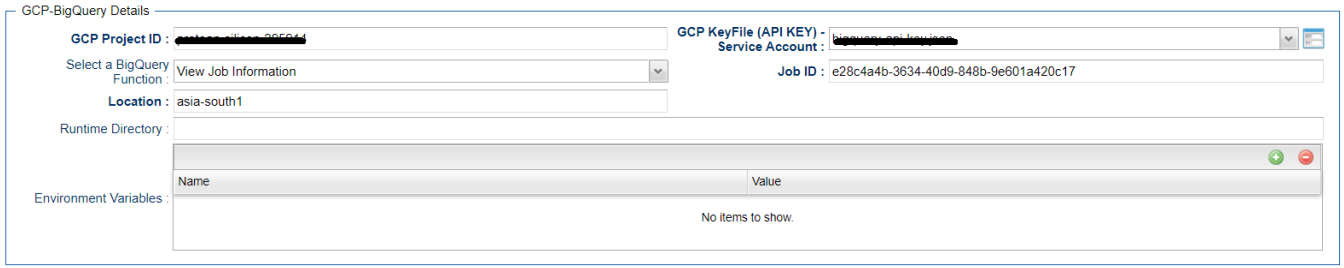


List dataset

List Tables in dataset

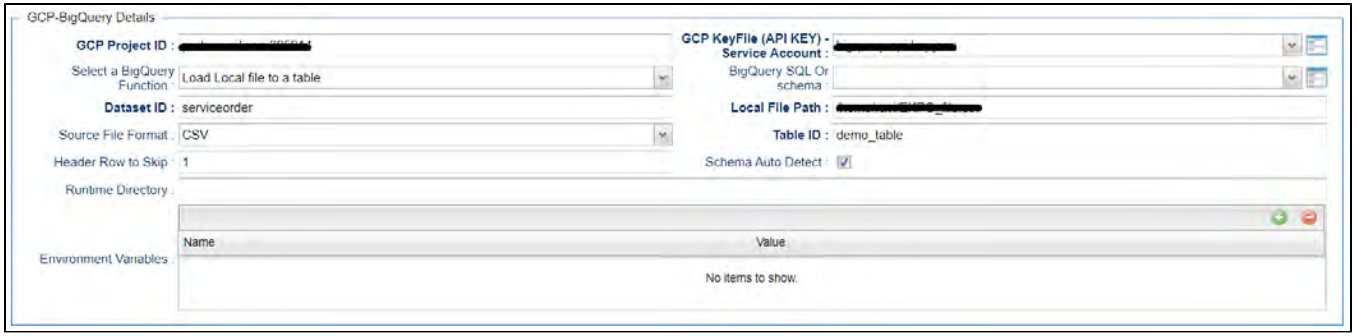


View Job Information

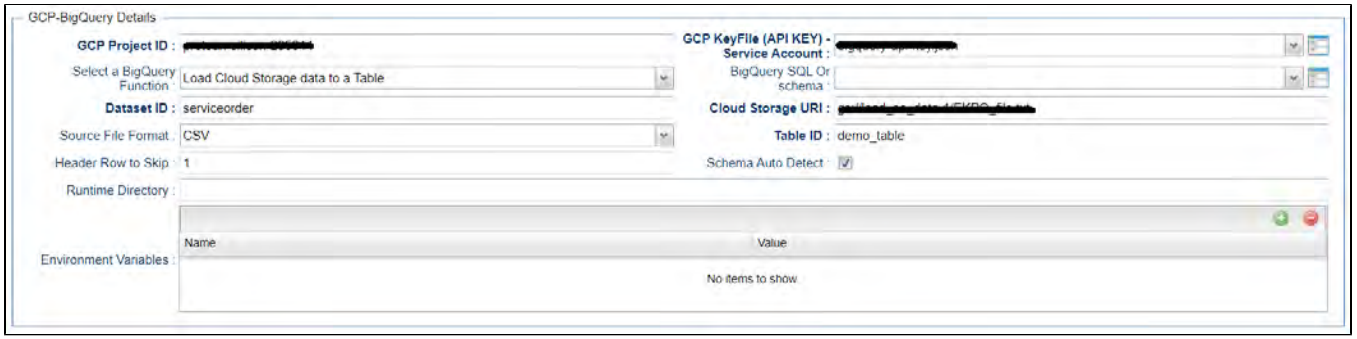


Create a dataset

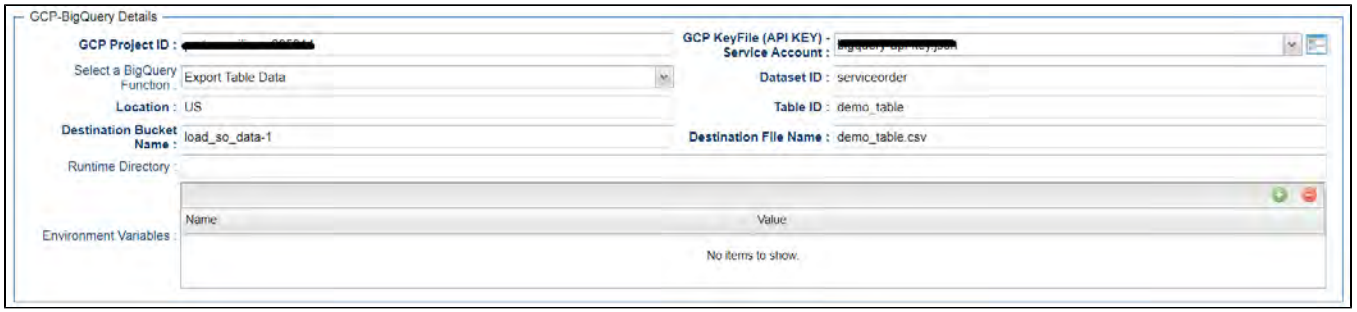
Load Local File to a Table



Load Cloud Storage Data to a Table



Export Table Data



Document References

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Informatica Cloud

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Overview

This Universal Task allows users to schedule any Data Integration Task or Linear Taskflow in the Informatica Cloud.

All communication is Web-Service based using the latest Informatica REST API version 2 & 3 with support for folders.

Log-files including activity-, session- and error-log are available from the Universal Controller Web UI in the same way as from the Informatica Monitoring Console.

Software Requirements

Software Requirements for Universal Agent

- Universal Agent for Linux or Windows Version 6.9.0.0 or later is required.

Software Requirements for Universal Controller

- Universal Controller 6.9.0.0 or later.
- Universal Controller license key with support for SAP Connector is required.

Software Requirements for the Application to be Scheduled

In order to connect to the SAP System, the SAP NetWeaver RFC SDK 7.50 libraries are required from SAP.

Those can be downloaded from the SAP Software Download: SAP NetWeaver RFC SDK 7.50.

Technical Considerations

- Start a data integration task in Informatica Cloud.
- Support for folder by using latest REST API version 3.
- Automatic Retrieval of Activity, Session and Error-log *.
- Supported task types for Data Integration:
    - Masking Task
    - Replication Task
    - Synchronization Task
    - Mapping Task
    - PowerCenter Task
    - Linear Taskflow
- Integrate the Informatica Task in any scheduling workflow.

*

The Error-log is retrieved only for Tasks. For workflows, the error message is provided.

Import Informatica Cloud Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Informatica Cloud Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

Field Descriptions for Informatica Cloud Universal Task

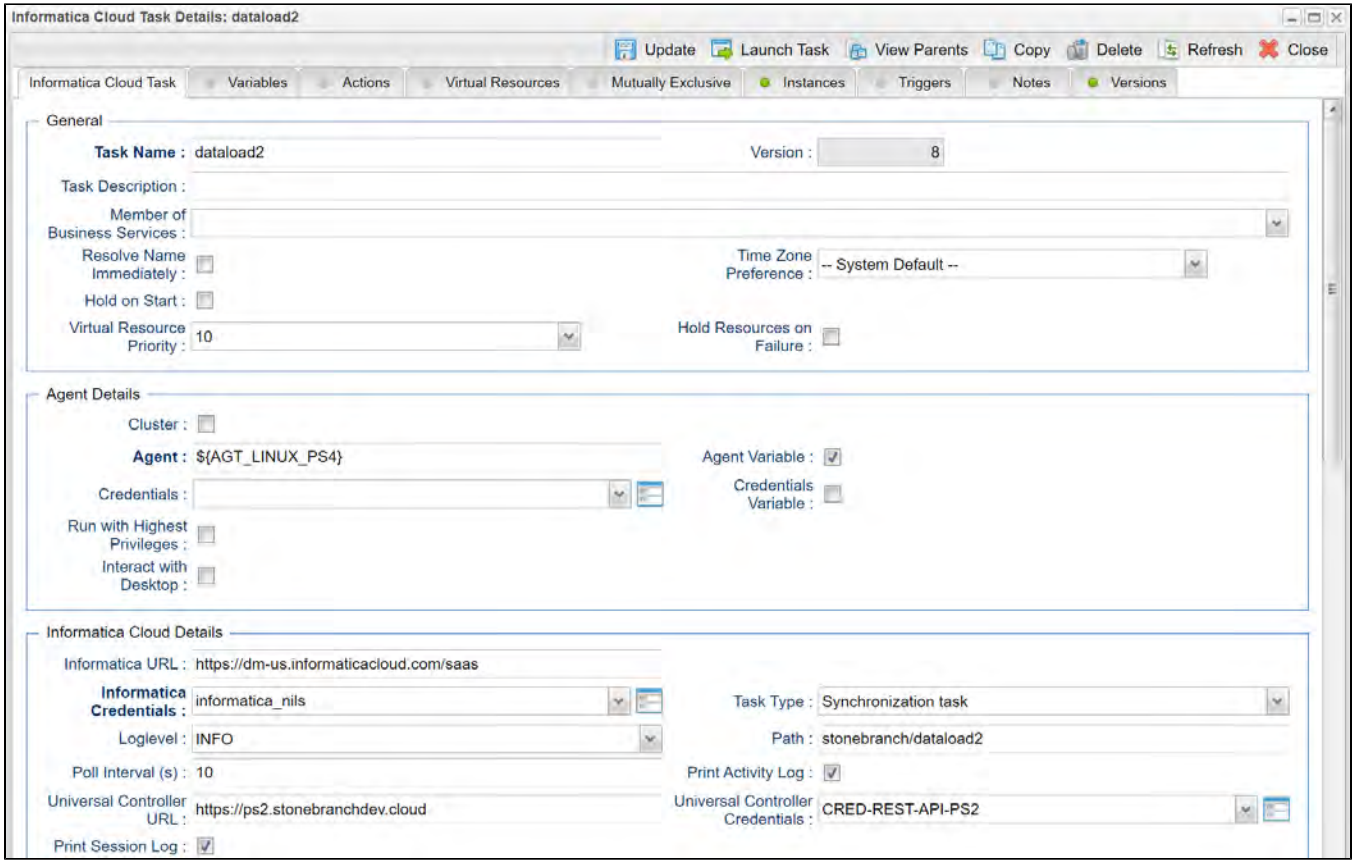
Field	Description
Informatica URL	Endpoint URL of the Informatica Cloud Rest API; for example, endpoint URL of the Informatica SaaS API: https://dm-us.informaticacloud.com/saas
Informatica Credentials	Informatica credentials for basic authentication with username and password.
Task Type	The following Task Types are available for selection: [Masking Task | Replication Task | Synchronization Task | Mapping Task | PowerCenter Task | Linear Taskflow]
Path	<path>/<taskname> (path is optional) Path and name of the task to start in Informatica Cloud; for example, *stonebranch/dataload2* starts the task *dataload2* in the folder *stonebranch*
Print Activity Log	Prints the Activity Log to the Output of the Task Instance. For an example refer to Activity Log screenshot. **Note**: The Error Log always will be printed to the Output of the Task Instance.
Print Session Log	Prints the Session Log to the Output of the Task Instance. **Note**: The Error Log always will be printed to the Output of the Task Instance.
Useproxy (default is NO)	[NO | YES] If set to YES, the fields to set-up the proxy server connections are displayed: • Proxy Server IP or hostname • Proxy Server Port • Proxy Server Credentials (optional)
Universal Controller URL	Universal Controller URL. URL has no backslash “/” at the end. Example: http://192.168.88.10:8080/uc
Universal Controller Credentials	Universal Controller Credential.s The Credentials must have “Web Service Access” Permissions.
Poll Interval (s)	Task Polling Interval in seconds; for example, a Poll Interval of 60 means that every 60 seconds, the Informatica Cloud will we queried if the started task has been finished.
Loglevel (default is INFO)	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

Example

The following screen shows an example of an Informatica Cloud Universal Task, which will start the Synchronization task dataload2 in the folder stonebranch.

The Task will print the Session Log and Activity Log into the Output of the task instance.

Informatica Cloud Universal Task

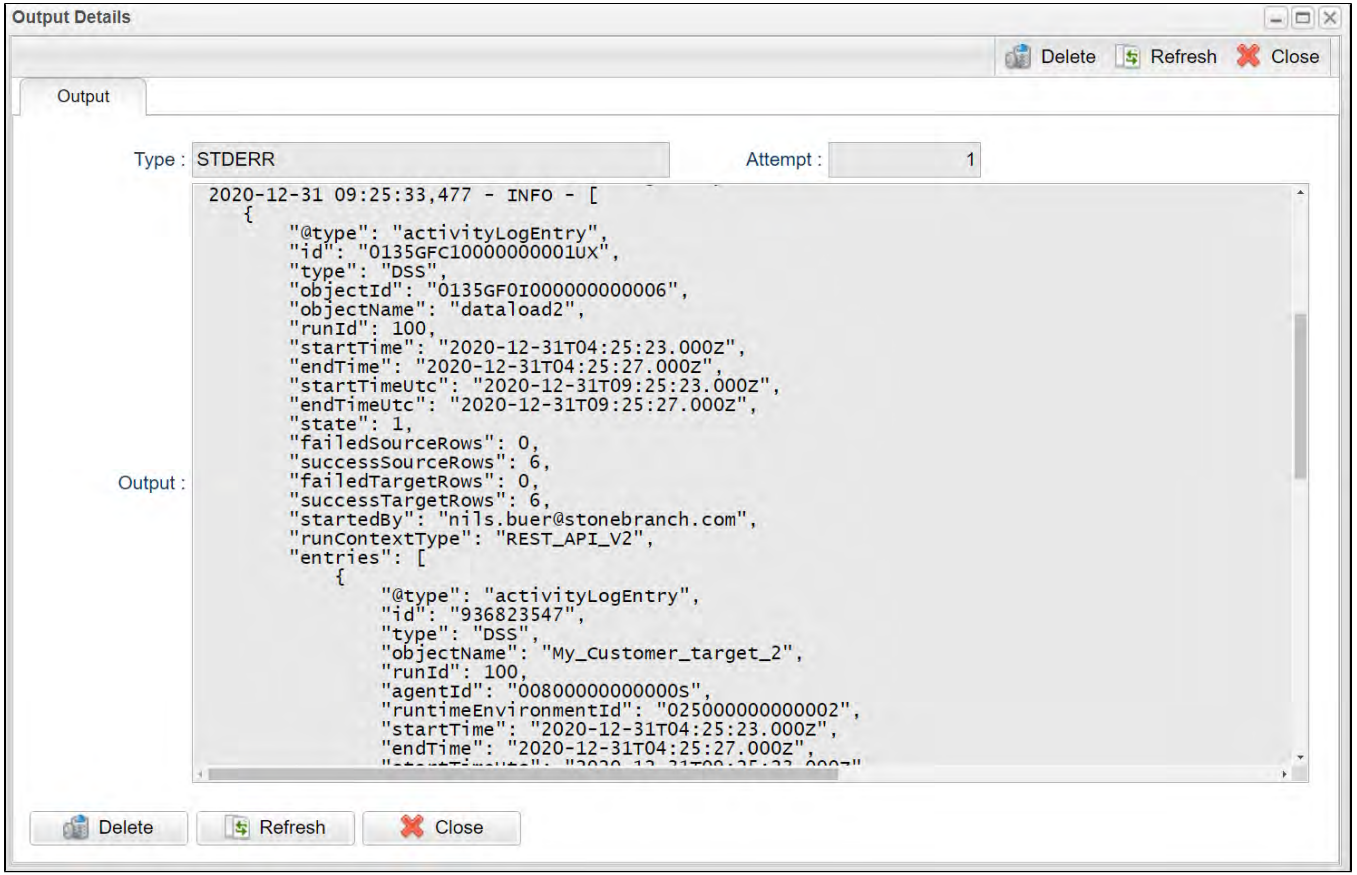


Log Files

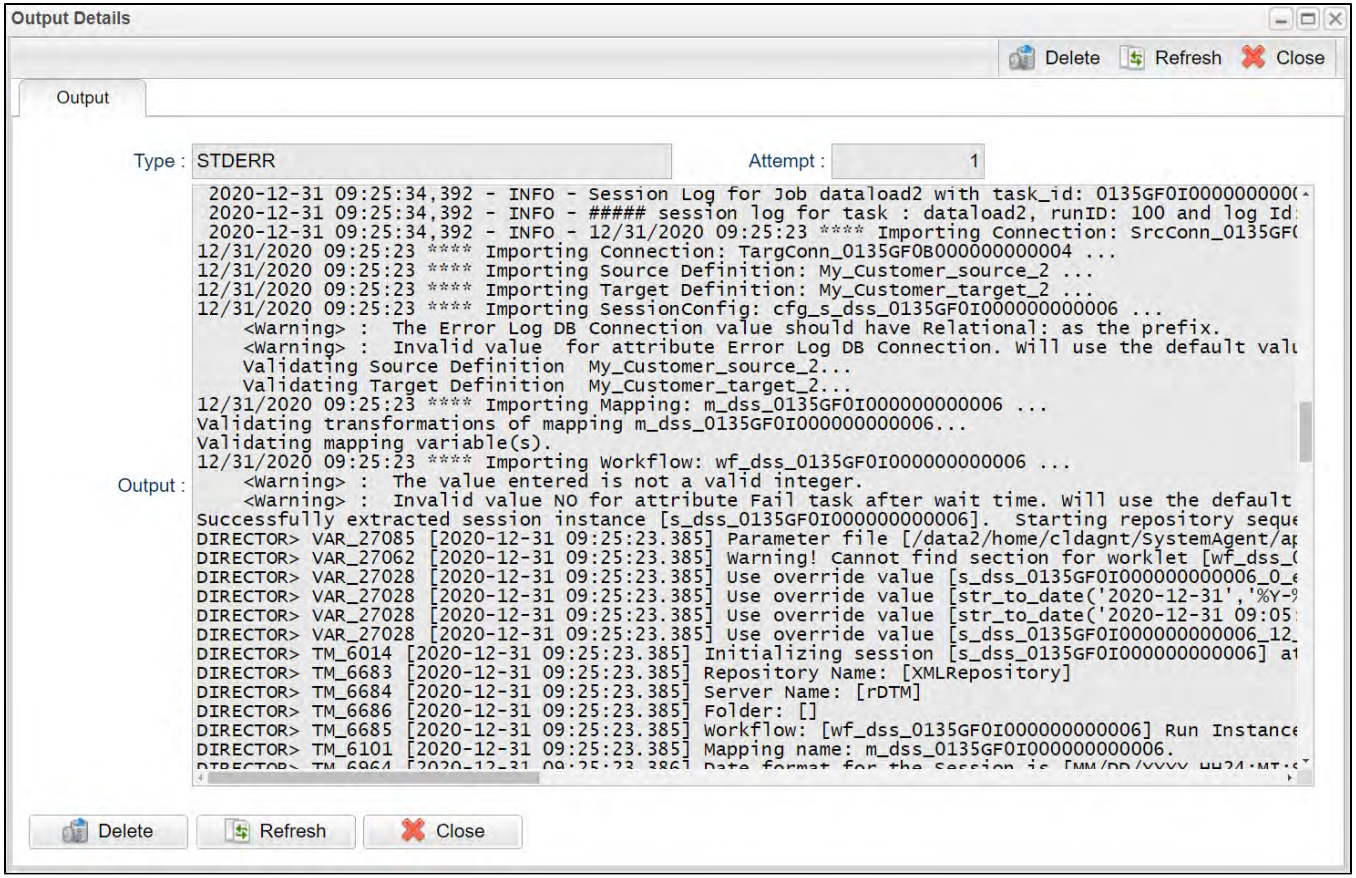
The Activity Log and Session Log will be provided if the corresponding Flags (Print Session Log, Print Activity Log) are set in the Universal Task.

The Error Log always will be printed to the Output of the Task Instance.

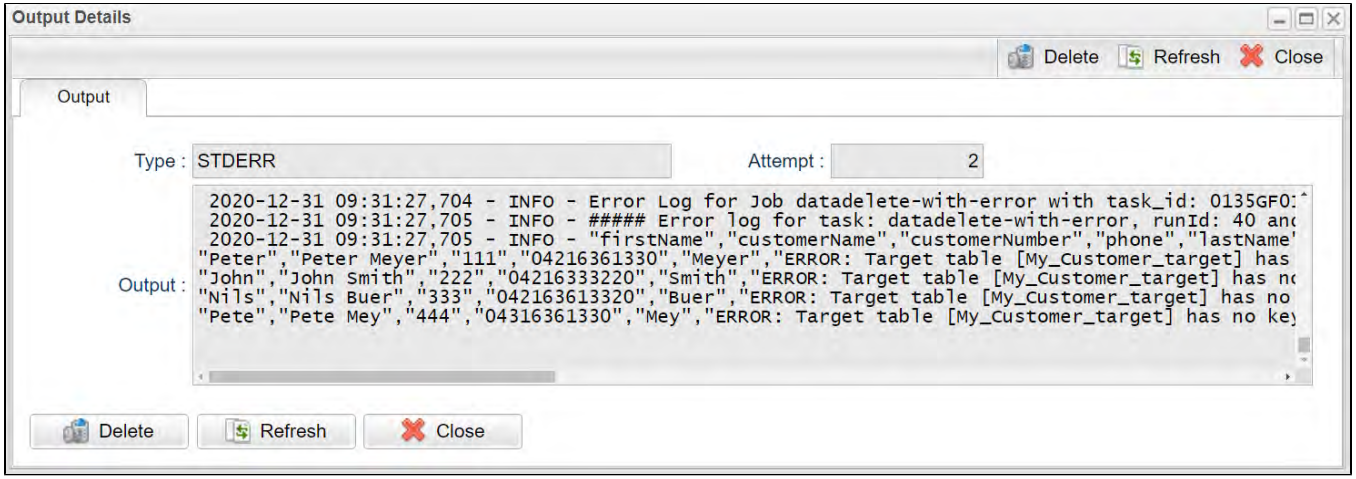
Activity Log


Output Details
Delete
Refresh
Close
Output
Type :
STDERR
Attempt :
1
Output :
2020-12-31 09:25:33,477 - INFO - [
{
"@type": "activityLogEntry",
"id": "0135GFC10000000001UX",
"type": "DSS",
"objectId": "0135GF0I000000000006",
"objectName": "dataload2",
"runId": 100,
"startTime": "2020-12-31T04:25:23.000Z",
"endTime": "2020-12-31T04:25:27.000Z",
"startTimeUtc": "2020-12-31T09:25:23.000Z",
"endTimeUtc": "2020-12-31T09:25:27.000Z",
"state": 1,
"failedSourceRows": 0,
"successSourceRows": 6,
"failedTargetRows": 0,
"successTargetRows": 6,
"startedBy": "nils.buer@stonebranch.com",
"runContextType": "REST_API_V2",
"entries": [
{
"@type": "activityLogEntry",
"id": "936823547",
"type": "DSS",
"objectName": "My_Customer_target_2",
"runId": 100,
"agentId": "00800000000000S",
"runtimeEnvironmentId": "025000000000002",
"startTime": "2020-12-31T04:25:23.000Z",
"endTime": "2020-12-31T04:25:27.000Z",
Delete
Refresh
Close

Session Log


Output Details
Delete
Refresh
Close
Output
Type : STDERR
Attempt : 1
Output :
2020-12-31 09:25:34,392 - INFO - Session Log for Job dataload2 with task_id: 0135GF0I000000000(
2020-12-31 09:25:34,392 - INFO - ##### session log for task : dataload2, runID: 100 and log Id:
2020-12-31 09:25:34,392 - INFO - 12/31/2020 09:25:23 **** Importing Connection: SrcConn_0135GF(
12/31/2020 09:25:23 **** Importing Connection: TargConn_0135GF0B000000000004 ...
12/31/2020 09:25:23 **** Importing Source Definition: My_Customer_source_2 ...
12/31/2020 09:25:23 **** Importing Target Definition: My_Customer_target_2 ...
12/31/2020 09:25:23 **** Importing SessionConfig: cfg_s_dss_0135GF0I000000000006 ...
<Warning> : The Error Log DB Connection value should have Relational: as the prefix.
<Warning> : Invalid value for attribute Error Log DB Connection. Will use the default valu
Validating Source Definition My_Customer_source_2...
Validating Target Definition My_Customer_target_2...
12/31/2020 09:25:23 **** Importing Mapping: m_dss_0135GF0I000000000006 ...
Validating transformations of mapping m_dss_0135GF0I000000000006...
Validating mapping variable(s).
12/31/2020 09:25:23 **** Importing Workflow: wf_dss_0135GF0I000000000006 ...
<Warning> : The value entered is not a valid integer.
<Warning> : Invalid value NO for attribute Fail task after wait time. Will use the default
Successfully extracted session instance [s_dss_0135GF0I000000000006]. Starting repository seque
DIRECTOR> VAR_27085 [2020-12-31 09:25:23.385] Parameter file [/data2/home/cldagnt/SystemAgent/ap
DIRECTOR> VAR_27062 [2020-12-31 09:25:23.385] Warning! Cannot find section for worklet [wf_dss_(
DIRECTOR> VAR_27028 [2020-12-31 09:25:23.385] Use override value [s_dss_0135GF0I000000000006_0_e
DIRECTOR> VAR_27028 [2020-12-31 09:25:23.385] Use override value [str_to_date('2020-12-31','%Y-%
DIRECTOR> VAR_27028 [2020-12-31 09:25:23.385] Use override value [str_to_date('2020-12-31 09:05:
DIRECTOR> VAR_27028 [2020-12-31 09:25:23.385] Use override value [s_dss_0135GF0I000000000006_12_
DIRECTOR> TM_6014 [2020-12-31 09:25:23.385] Initializing session [s_dss_0135GF0I000000000006] at
DIRECTOR> TM_6683 [2020-12-31 09:25:23.385] Repository Name: [XMLRepository]
DIRECTOR> TM_6684 [2020-12-31 09:25:23.385] Server Name: [rDTM]
DIRECTOR> TM_6686 [2020-12-31 09:25:23.385] Folder: []
DIRECTOR> TM_6685 [2020-12-31 09:25:23.385] Workflow: [wf_dss_0135GF0I000000000006] Run Instance
DIRECTOR> TM_6101 [2020-12-31 09:25:23.385] Mapping name: m_dss_0135GF0I000000000006.
Delete
Refresh
Close

Error Log


Output Details
Delete
Refresh
Close
Output
Type :
STDERR
Attempt :
2
Output :
2020-12-31 09:31:27,704 - INFO - Error Log for Job datadelete-with-error with task_id: 0135GF0:
2020-12-31 09:31:27,705 - INFO - ##### Error log for task: datadelete-with-error, runId: 40 and
2020-12-31 09:31:27,705 - INFO - "firstName","customerName","customerNumber","phone","lastName"
"Peter","Peter Meyer","111","04216361330","Meyer","ERROR: Target table [My_Customer_target] has
"John","John Smith","222","04216333220","Smith","ERROR: Target table [My_Customer_target] has no
"Nils","Nils Buer","333","042163613320","Buer","ERROR: Target table [My_Customer_target] has no
"Pete","Pete Mey","444","04316361330","Mey","ERROR: Target table [My_Customer_target] has no key
Delete
Refresh
Close

Informatica PowerCenter

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  - Action Type: startWorkflow
  - Action Type: startWorkflowFromTask
- Verify Workflow execution in Informatica PowerCenter Workflow Monitor
  - How to Look Up a Workflow Instance in PC

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Overview

This Universal Task allows users to schedule Informatica PowerCenter Workflows and Tasks, including retrieval of the workflow and session log.

It also is possible to start a Workflow from a certain task onwards.

The Universal Task schedules Informatica PowerCenter via the Informatica PowerCenter Web Services Hub; therefore, no installation on any Informatica Informatica system is required.

Software Requirements

Software Requirements for Universal Agent

- Universal Agent for Linux or Windows Version 6.9.0.0 or later is required.

Software Requirements for Universal Controller

- Universal Controller 6.9.0.0 or later.

Software Requirements for the Application to be Scheduled

- The Universal Task has been tested for PowerCenter 10.1.0.
- The Informatica PowerCenter Web Services Hub needs to be started in Informatica PowerCenter Administrator.

Technical Considerations

- This task It is based on the standard Informatica PowerCenter Web Services Hub using SOAP protocol.
- The Informatica PowerCenter Web Services Hub Interface is called from a Universal Agent running on a Linux Server or Windows Server.
- Start a Task in an Informatica PowerCenter Workflow.
- Start an Informatica PowerCenter Workflow.
- Start an Informatica PowerCenter Workflow from a given Task onwards.
- Different log-levels can be selected for example, Info and debug.
- The Workflow log is always provided.
- Http and Https connections are support (Note: the host certificate is not verified).

Import Informatica PowerCenter Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Informatica PowerCenter Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

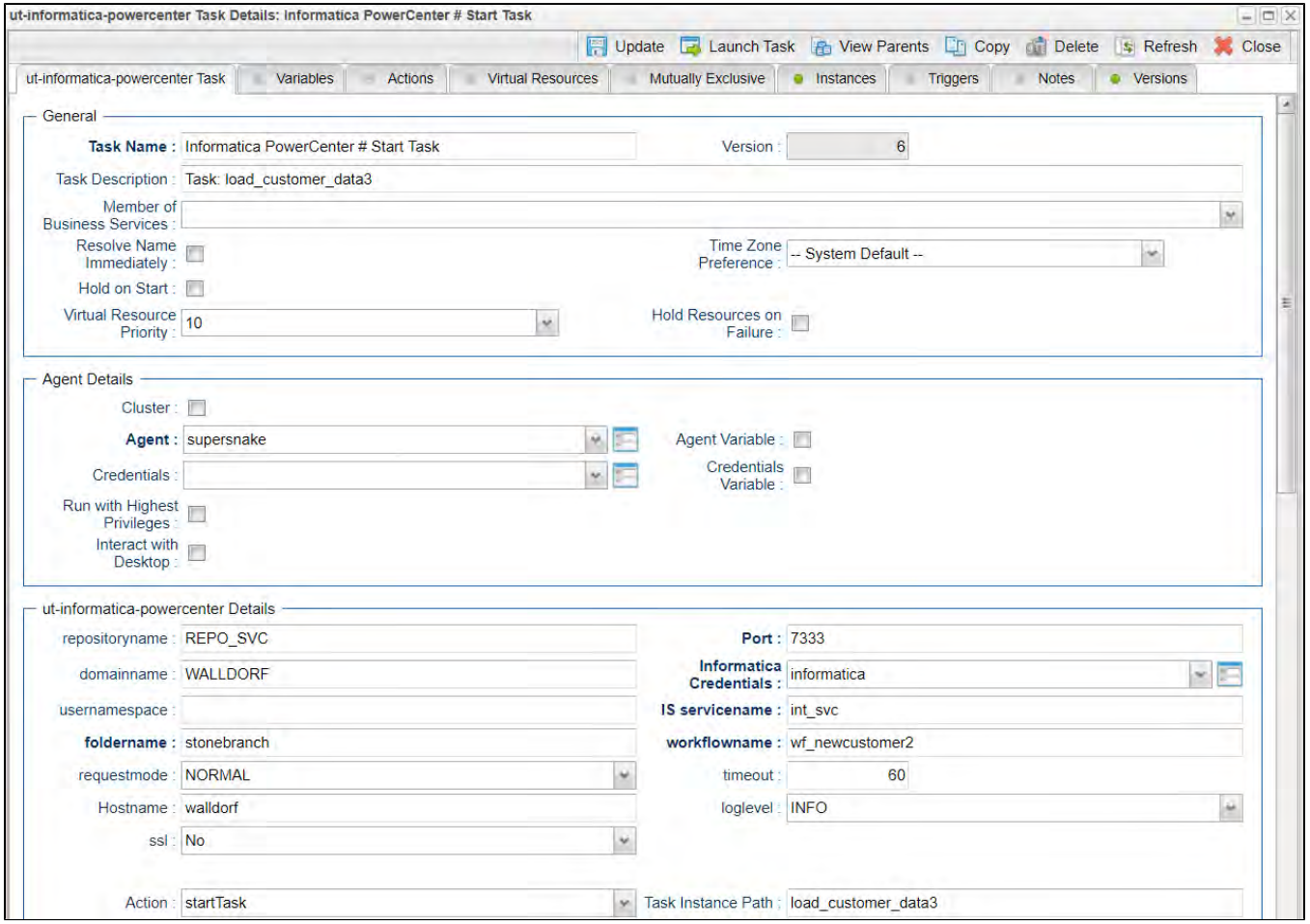
Field Descriptions for Informatica PowerCenter Universal Task

Field	Description
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL].
Agent	The Universal Agent, which runs the Python request module to call the PC “startWorkflow” SOAP Webservice. Both Linux and Windows Universal Agents are supported.
Repositoryname	Name of the Repository to log in to.
usernamespace	The security domain of the user account used to log in to the repository.

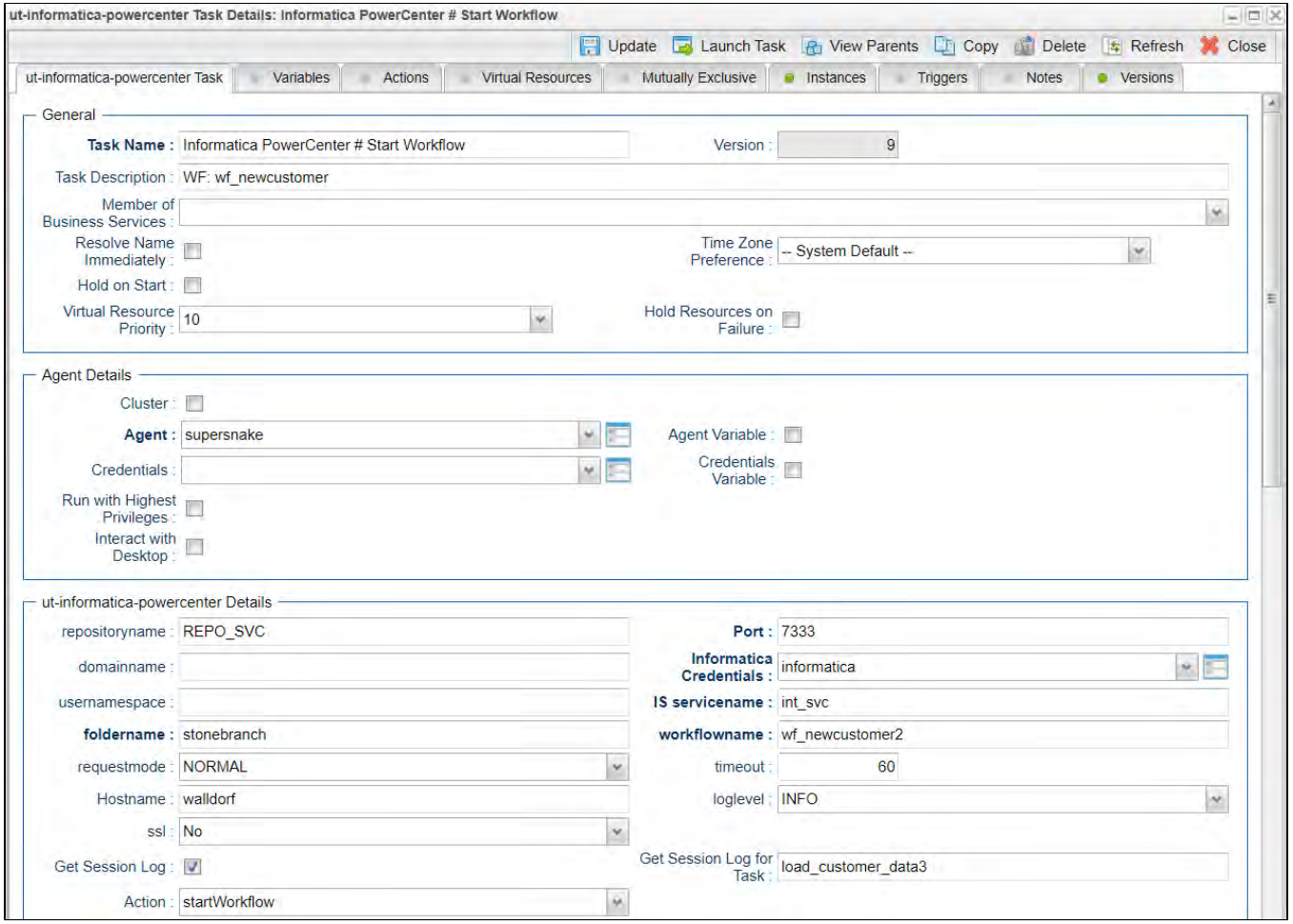
	Required if there is more than one security domain in the Informatica PowerCenter domain.
Domainname	Domain name for the Integration Service.
Foldername	Name of the folder containing the workflow.
requestmode	Indicates the recovery strategy for the session task: • NORMAL : Restarts a session without recovery. • RECOVERY : Recovers a session.
Informatica Credentials	Credentials for Informatica PowerCenter.
IS Servicename	Name of the Integration Service that runs the workflow.
workflowname	Name of the workflow to run.
Action	The following Actions can be selected: startWorkflow | startTask | startWorkflowFromTask • **startWorkflow**: Start a Task in an Informatica PowerCenter Workflow • **startTask**: Start an Informatica PowerCenter Workflow • **startWorkflowFromTask**: Start an Informatica PowerCenter Workflow from a given Task onwards Refer to Examples for an example screenshot of each action.
TaskinstancePath	Name and Path of the Task to start in the Workflow.
Get Session Log	If enabled, the Session Log of the Taskname provided in the Field ***Get Session Log for Task*** is written to the taskinstance Output. Note: In case of a Workflow with multiple task, only the session log of the task provided under the field taskinstancePath is written to the taskinstance Output.
Get Session Log for Task	The field is only visible if the choice field **Get Session Log** is enabled. Name and Path of the Task for which the session log should be retrieved.
Timeout	Maximum amount of time the Web Services Hub can take to process a request and generate a SOAP response before the request times out. If the Web Services Hub is unable to generate a response within the timeout period, it sends a fault message to the web service client and drops the connection. Default is 180 seconds. Minimum value is 60 seconds. If the operation does not complete within the timeout period, the operation fails.
Hostname	Web Services Hub host name.
Port	Web Services Hub port number.
SSL	Choose if you want to connect via *http* or *https* to your webservice hub. In the Power Center Administration GUI, you can look up the configuration by clicking on the webservice hub. For example, • *http*: *http://walldorf:7333/wsh* • *https*: *https://walldorf:10333/wsh*

Examples

Action Type: startTask

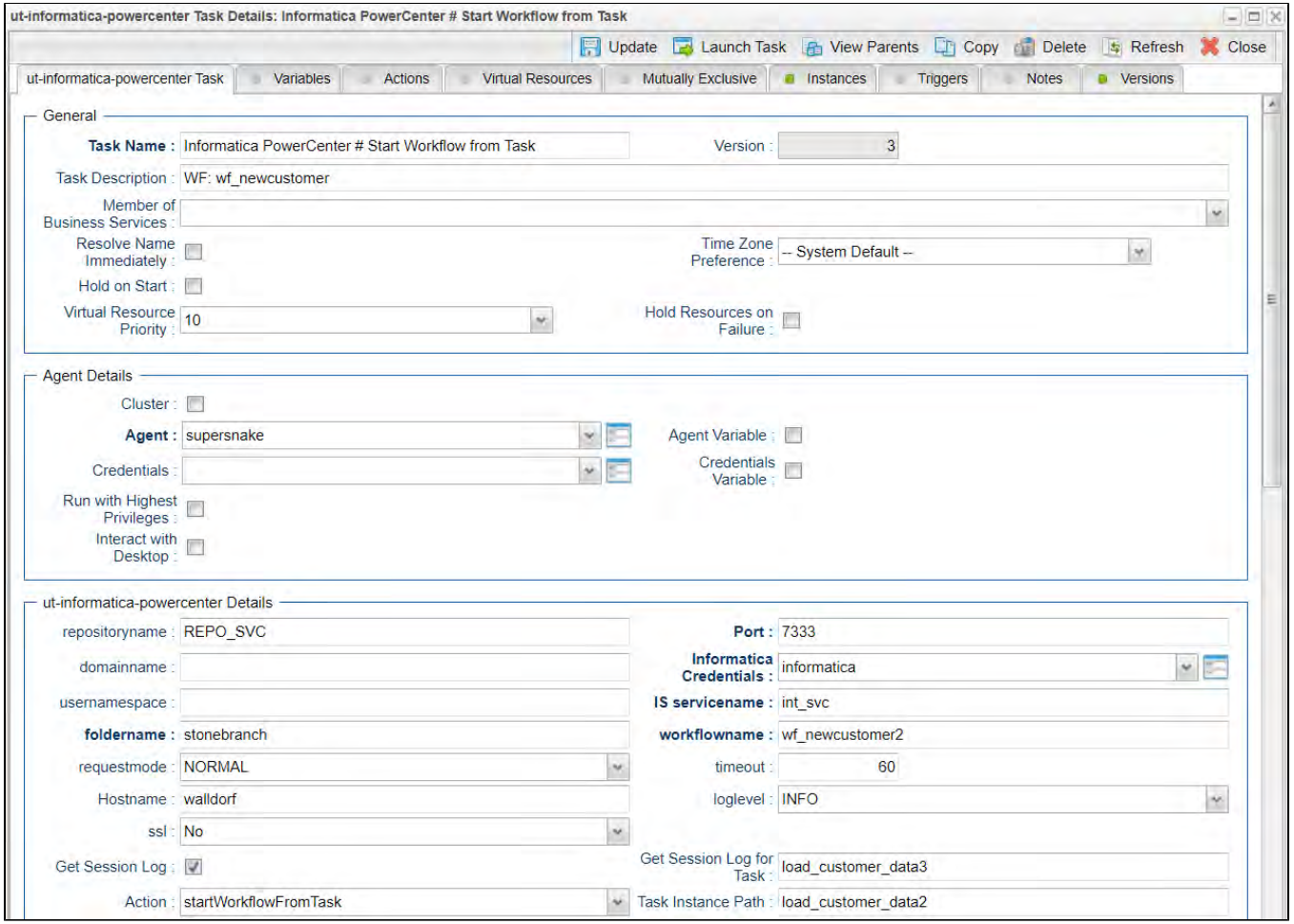


Action Type: startWorkflow



Action Type: startWorkflowFromTask

The following Task starts an Informatica PowerCenter Workflow from a specific Task onwards

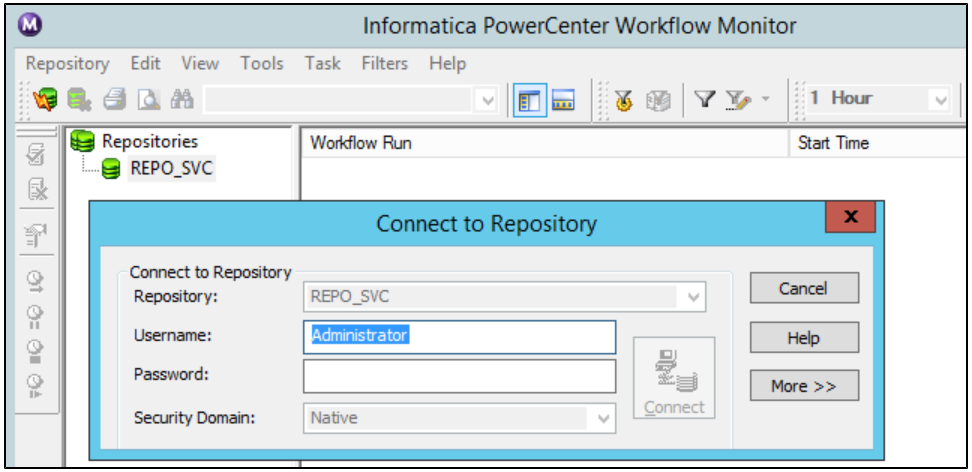


Verify Workflow execution in Informatica PowerCenter Workflow Monitor

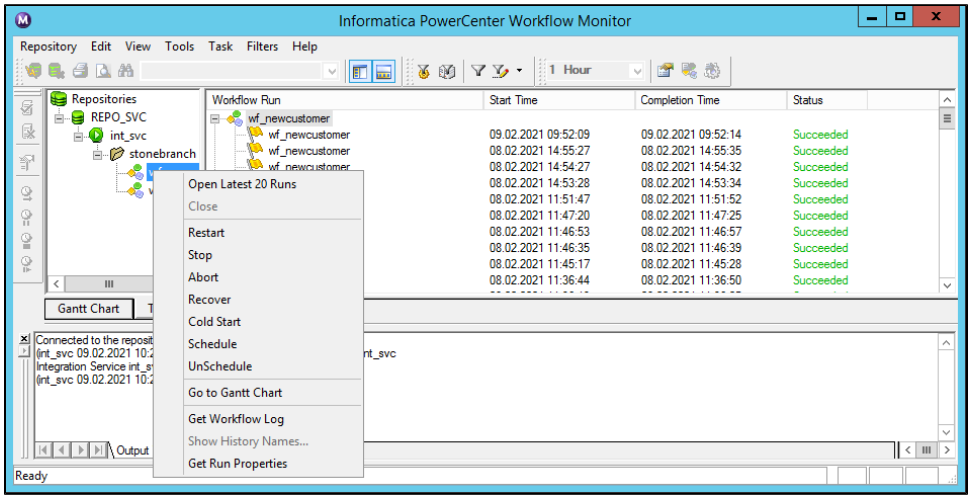
The following provides to non-Informatica PowerCenter Consultants with an Introduction on how to verify that a Workflow, which was started via the Universal Task for Informatica PowerCenter, has been successfully executed in PC.

How to Look Up a Workflow Instance in PC

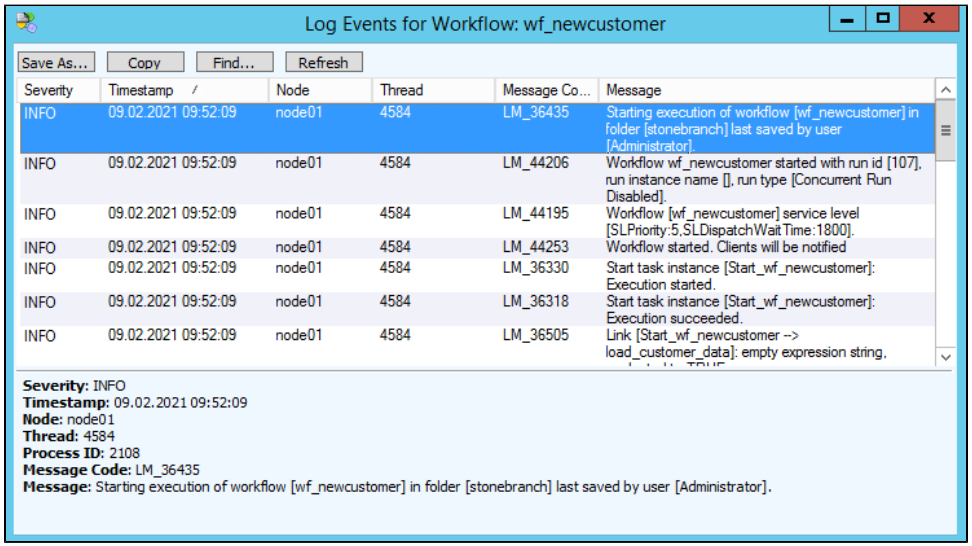
1. **Log-in to the Informatica PowerCenter Workflow Monitor.**



2. **Select your Workflow.**
   Browse to your Workflowname. In the following example, the Workflow is named: wf_newcustomer. On the right side of the screen, you can see all executed instances including their status; for example, *Succeeded*.



3. **Verify the Workflow Log**
   Right-clicking on the workflow will allow you to *Get the Workflow Log.*

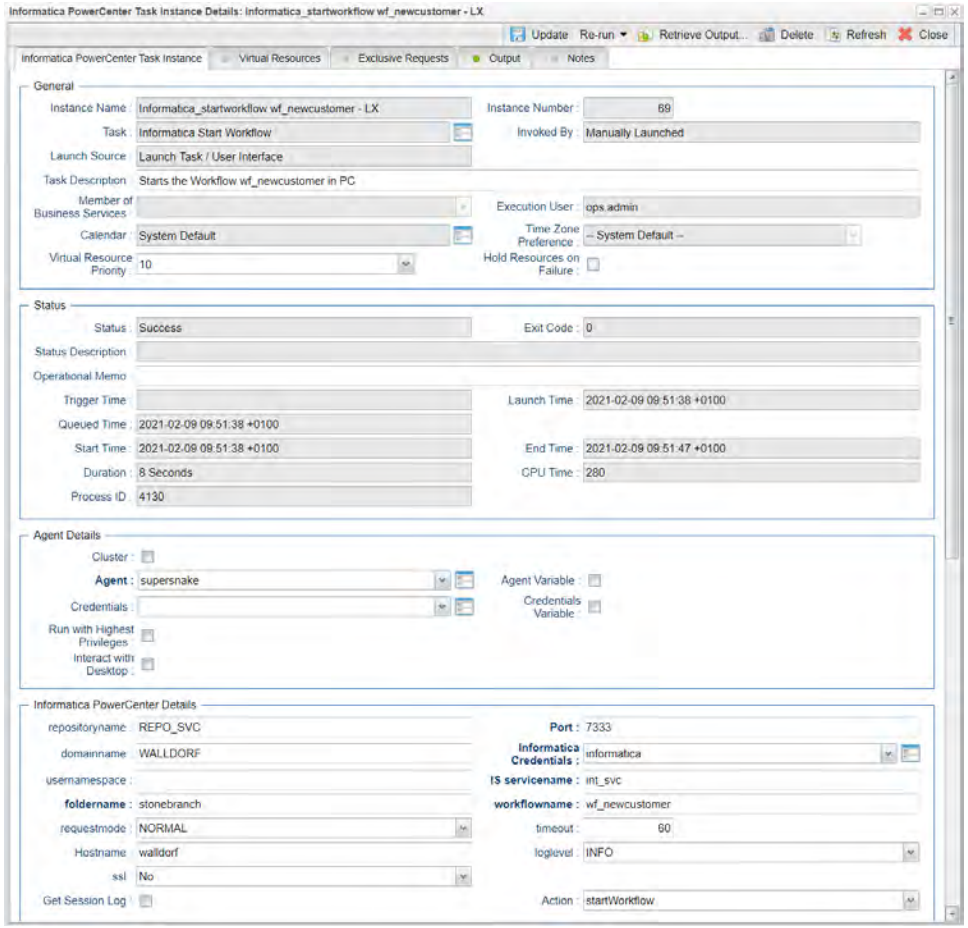


Note: The same Workflow log information is also available in the Universal Task Output.

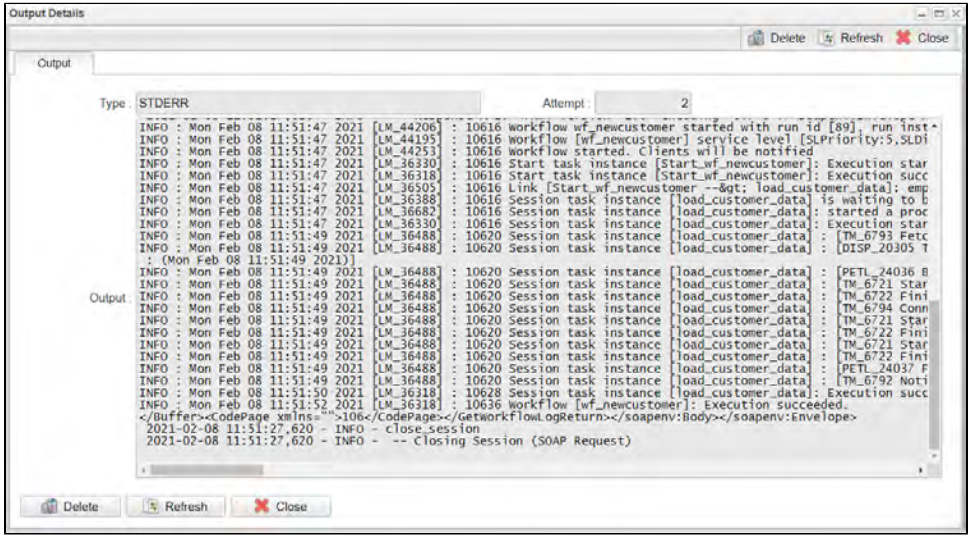
4. **Verify the Workflow Log in Universal Automation Center**

   All Log Information shown in the Informatica PowerCenter Workflow Monitor also is available in the Universal Controller Web-GUI in the Task Instance screen and Output.

   The following screenshot shows the Task Instance Screen:


Informatica PowerCenter Task Instance Details: Informatica_startworkflow wf_newcustomer - LX
Update
Re-run
Retrieve Output...
Delete
Refresh
Close
Informatica PowerCenter Task Instance
Virtual Resources
Exclusive Requests
Output
Notes
General
Instance Name : Informatica_startworkflow wf_newcustomer - LX
Instance Number : 69
Task : Informatica Start Workflow
Invoked By : Manually Launched
Launch Source : Launch Task / User Interface
Task Description : Starts the Workflow wf_newcustomer in PC
Member of Business Services :
Execution User : ops.admin
Calendar : System Default
Time Zone Preference : -- System Default --
Virtual Resource Priority : 10
Hold Resources on Failure :
Status
Status : Success
Exit Code : 0
Status Description :
Operational Memo :
Trigger Time :
Launch Time : 2021-02-09 09:51:38 +0100
Queued Time : 2021-02-09 09:51:38 +0100
Start Time : 2021-02-09 09:51:38 +0100
End Time : 2021-02-09 09:51:47 +0100
Duration : 8 Seconds
CPU Time : 280
Process ID : 4130
Agent Details
Cluster :
Agent : supersnake
Agent Variable :
Credentials :
Credentials Variable :
Run with Highest Privileges :
Interact with Desktop :
Informatica PowerCenter Details
repositoryname : REPO_SVC
Port : 7333
domainname : WALLDORF
Informatica Credentials : informatica
usernamespace :
IS servicename : int_svc
foldername : stonebranch
workflowname : wf_newcustomer
requestmode : NORMAL
timeout : 60
Hostname : walldorf
loglevel : INFO
ssl : No
Get Session Log :
Action : startWorkflow

The following screen shows the Log file in the Task Instance Output Screen:



Jenkins Integration

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Introduction

This integration improves the functionality of Jenkins when orchestrated from Universal Controller. It encourages collaboration by enabling the well-controlled and automated deployment of applications over to the operations side.

Overview

- UAC communicates with Jenkins through the Python Jenkins module.
- Jenkins can make REST-API calls to the Universal Controller to trigger any task or workflow.
- This task can trigger or start an existing build job in Jenkins. Universal controller will monitor the build execution in Jenkins until completion, then send the build results to the Controller. With this task, users can create a build job in Jenkins from the Controller. Any Jenkins build job definitions in XML will be stored centrally in the Controller.
- This task offers the functionality to fetch the Jenkins job build information and list running build info in Jenkins from Universal Controller.
- Enable/disable Jenkins jobs and nodes and delete/copy/rename Jenkins jobs from Universal Controller.
- When users list the Installed plugin in Jenkins, a plugin install can be triggered from the Universal Controller.
- Set the next build info for Jenkins build jobs.

Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against a Jenkins instance.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests
    - Jenkins

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 6.6 and later with python options installed
- Universal Agent for Linux Version 6.6 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.6.0.0 and later

Software Requirements for the Application to be Scheduled

This Universal Task has been tested with the following Jenkins versions:

- 2.1
- 2.2

Technical Considerations

This Universal Task uses the Python Jenkins Module functions (https://python-jenkins.readthedocs.io/en/latest/) to make REST API calls to Jenkins server.

Jenkins Integration Key Features

Feature	Description

Get Jenkins Jobs build information	Get a Jenkins job build information details
Create a Jenkins Build Job	Allows you to create a Jenkins build job by passing the XML configuration script from Universal Controller
Get Last build number	Get the latest build number for a job
Set Next build number	Allows to set the next build number for the Jenkins job
Trigger or start an existing build job	Trigger an existing Jenkins build job in Jenkins and Universal Controller will monitor the build execution in Jenkins until completion, then send the build results to the Controller
List running build info	Allows to list the build job that are running
Enable/Disable Jenkins Job	function to enable or disable a Jenkins build job
Delete/Copy/Rename Jenkins Job	function to copy or delete or rename a Jenkins Job
Get Console output for a build	Get the output of a Jenkins Build job
Enable / disable Nodes in Jenkins	Enable or Disable a Jenkins node
Get all installed plugins info	List all the plugins that are installed in a Jenkins server
Install a plugin for Jenkins environment	Allows to install a specific Jenkins plugin

Import Jenkins Integration Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Jenkins Integration Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

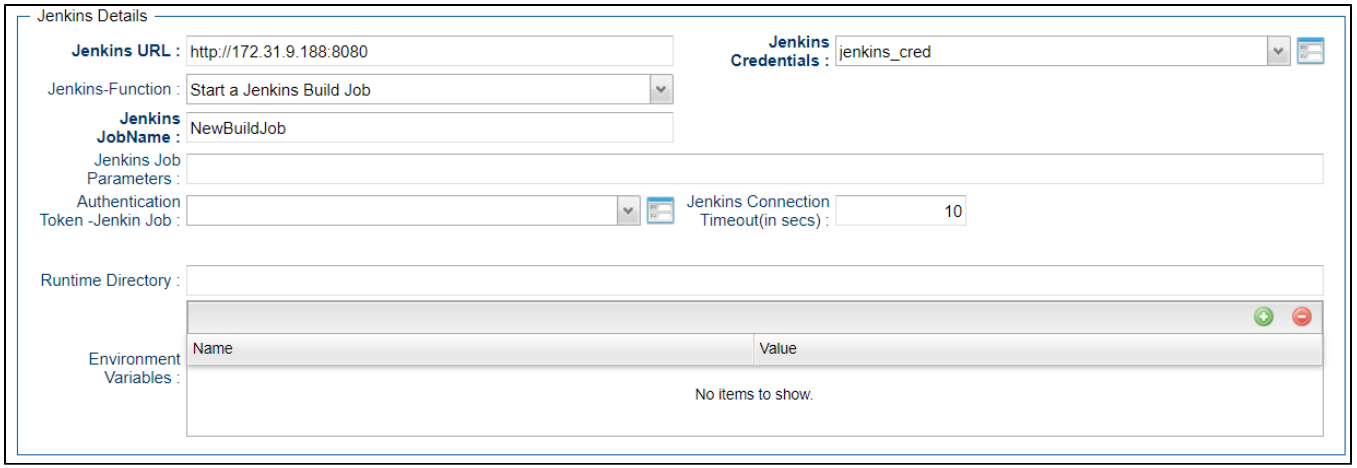
Field Descriptions for Jenkins Integration Universal Task

Field	Description
Jenkins Function	Select the desired function you would need to perform in Jenkins
Jenkins URL	URL of the Jenkins server, to make api calls
Jenkins Credentials	Jenkins User credentials or auth token to authenticate API calls
Jenkins Function	Select the desired function you would need to perform in Jenkins

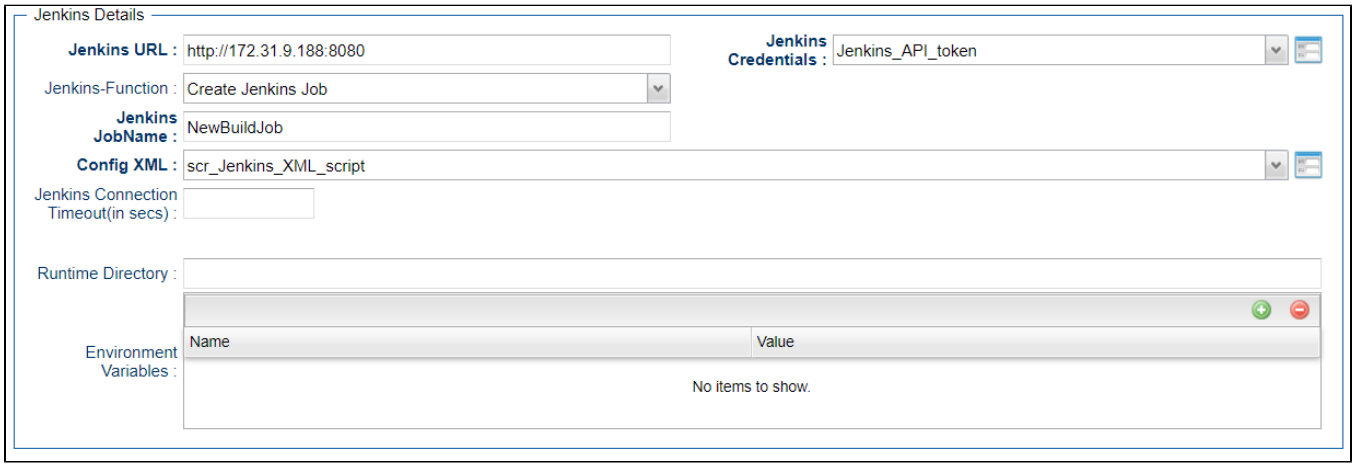
Jenkins Job Name	Name of the Jenkins Job Name
Jenkins Job Parameters	The parameters that would need to passed along for starting a Jenkins Build
Job Token	If the Jenkins can be triggered remotely by using a job token then pass on the Job token parameter
Config XML	Provide the XML script for the creation of new job in Jenkins
Rename Job	specify the job name that needs to be renamed
From jobname	give the existing from where its needs to be copied eg: demo_job or folder/demo_job
To Job Name	copy/rename to a new Job Name eg: demo_job or folder/demo_job
Enable Node	specify the node name that needs to be enabled
Disable Node	specify the node name that needs to be disabled
Delete Job	Specify the job that needs to be deleted in Jenkins
Next Build Number(+ Last Build Number)	should be greater than the last builder otherwise jenkins will ignore the request
Enable Job	Specify the job name that needs to be enabled
Disable Job	specify the job that needs to be disabled
Jenkins Build Number	Jenkins build number for the job(int)
Jenkins Connection Timeout(in secs)	Specify the connection time out interval in seconds
Jenkins Plugin Name	Provide the Jenkin Plugin short name to be installed

Examples for Jenkins Integration Universal Tasks

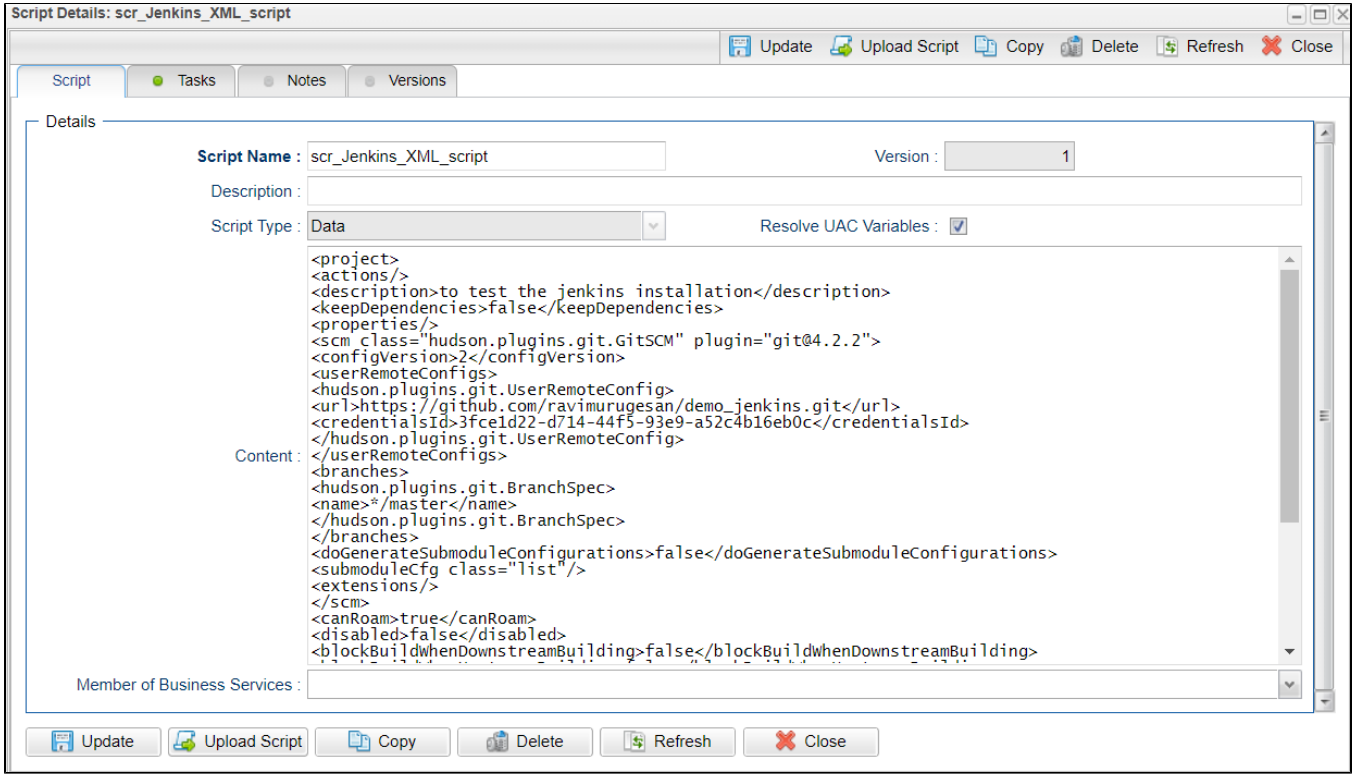
Start a Jenkins Build



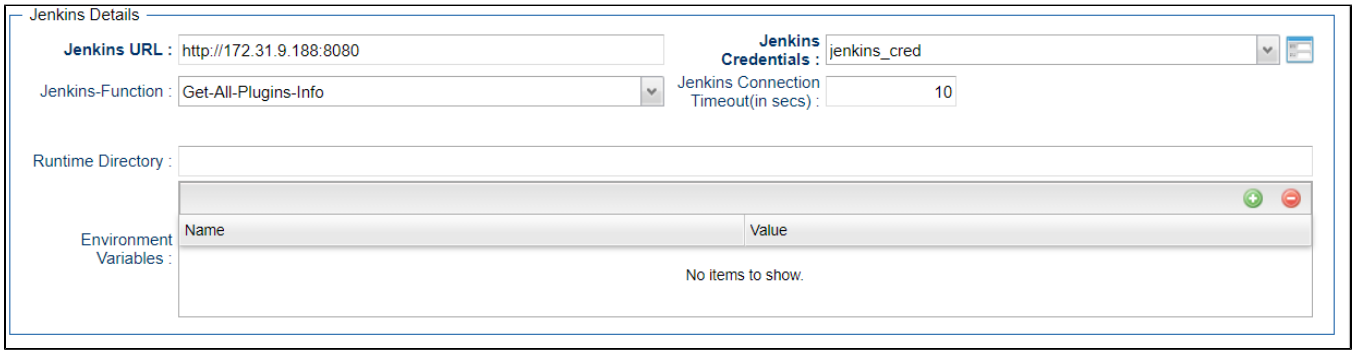
Create a Jenkins Job



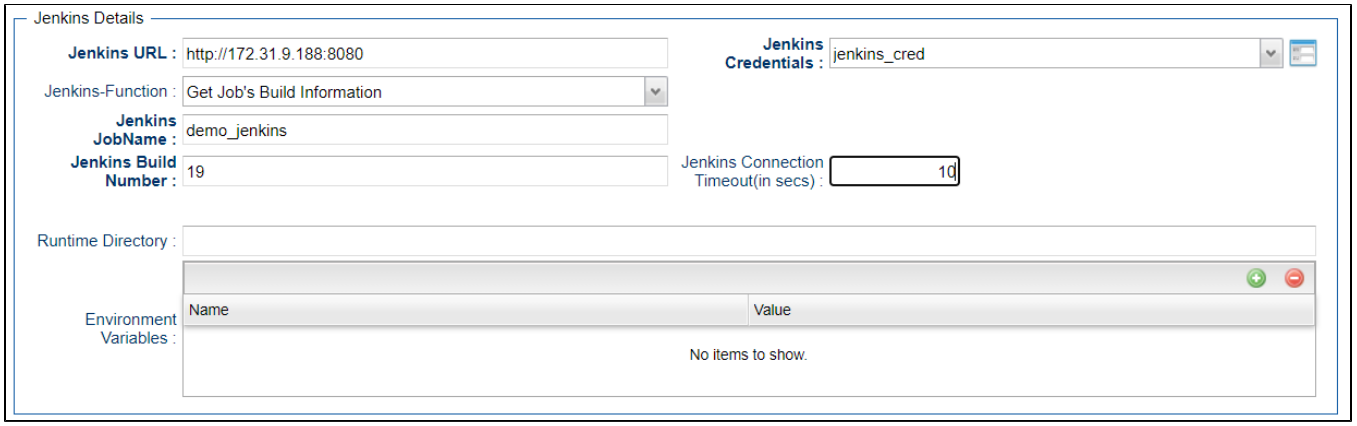
New Jenkins Job XML Configuration



Get Plugins List



Job Build Information



Document References

This document references the following documents:

Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

JSCAPE MFT

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  - Integration Flow
  - Output Only Fields
  - Dynamic Commands
  - Task Instance Rerun Behavior
- Import Universal Template
- Configure Universal Task
- Field Descriptions for JSCAPE MFT Universal Task
  - Function = PGPEncrypt
  - Function = PGPDecrypt
  - Function = RunTrigger
  - Function = SFTPUpload
  - Function = SFTPDownload
  - Function = TradingPartnerUpload
  - Function = TradingPartnerDownload
  - Function = TradingPartnerRegExUpload
  - Function = TradingPartnerRegExDownload
- Examples for JSCAPE MFT Universal Tasks
- Document References

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Introduction

This integration provides UAC customers the ability to manage and integrate their JSCAPE Managed File Transfer Server processes within their UAC automation processes and workflows.

Overview

This integration delivers a the JSCAPE MFT Universal Template that allows UAC customers to build Tasks to perform the following JSCAPE Managed File Transfer Server functions:

- PGP Encrypt
- PGP Decrypt
- Run a UDM Gateway Trigger
- SFTP File Upload
- SFTP File Download
- Trading Partner File Upload
- Trading Partner File Download
- Trading Partner File Upload using a Regex or Generic Filename Pattern
- Trading Partner File Download using a Regex or Generic Filename Pattern

Software Requirements

This integration requires a Universal Agent and a Python runtime to execute the Universal Task.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.7.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests version 2.22.0

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 7.0.0.0 and later with python options installed
- Universal Agent for Linux Version 7.0.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 7.0.0.0 and later

Software Requirements for the Application to be Scheduled

- JSCAPE Managed File Transfer Server version 12 and higher.

Integration Description

Integration Flow

The JSCAPE MFT Universal Task performs the following:

1. Login to JSCAPE MFT Server
2. Check JSCAPE MFT Server Version
3. Create Temporary JSCAPE MFT Server Trigger with a generated unique name to perform the desired action. Except Run Trigger which runs the requested Trigger definition directly.
4. Run JSCAPE MFT Server Trigger.

5. Get JSCAPE MFT Server Trigger Status
6. If Successful, delete the Temporary Trigger definition (Except Run Trigger)
7. Retrieve Trigger Log

Output Only Fields

The JSCAPE MFT Universal Task Instances will provide the following display information:

Fieldname	Description
Trigger Name	Returns the generated temporary trigger name, except for Run Trigger when the Trigger name is displayed.
Trigger Status	Returns the current status of the Trigger.
Trigger ID	Returns the JSCAPE MFT Server Trigger Process ID.
MFT Server Version	Returns the version of the JSCAPE MFT Server.

Dynamic Commands

The following Universal Task Instance specific commands are available:

Command Name	Allowed Task Instance Status'	Description
Cancel (Kill) Trigger	RUNNING	Issues the JSCAPE MFT Server Kill command against the running Trigger.
Cleanup (Delete) Temporary Trigger	FAILED	Deletes the temporary Trigger. Use this option if you do not want to rerun a failed temporary Trigger, failed triggers are not automatically deleted to facilitate a rerun of the Trigger. It is recommended to Force Finish the failed Universal Task instance after deleting the temporary trigger. This command is not effective for Run Trigger.

Task Instance Rerun Behavior

Performing a rerun against a JSCAPE MFT Universal Task instance behaves as follows.

- When the task is rerun and no JSCAPE MFT Server Trigger Process ID is available a new Trigger will be created and run.
- When the task is rerun and a JSCAPE MFT Server Trigger Process ID is available a JSCAPE MFT Server Rerun command will be issued against the existing Trigger. Note that for the Run Trigger Function the behavior of the JSCAPE MFT Server Rerun command can be impacted by the “On Rerun Restart All Actions” option in the Task instance definition.

Import Universal Template

To use the Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature, check that the Resolvable Credentials Permitted system property has been set to true. For more information about Resolvable Credentials click here.
2. Download the provided ZIP file.
3. In the Universal Controller UI, select Administration >Configuration > Universal Templates to display the current list of Universal Templates.

4. Click Import Template.
5. Select the template ZIP file and Import.

When the template has been imported successfully, the Universal Template will appear on the list, refresh your Navigation Tree to see these tasks in the Automation Center Menu.

Configure Universal Task

Create JSCAPE MFT Tasks as required.

Field Descriptions for JSCAPE MFT Universal Task

Function = PGPEncrypt

Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443
MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **PGPEncrypt** Function.
Encrypted File Name	The name of the target encrypted file.
Plain Text File Name	The name of the source plaintext file.
PGP Key	Select the PGP Key to use for encryption.
Delete Source File	Specify if the source plaintext file is to be deleted.
Compress	Specify if the target encrypted file is to be compressed.

Function = PGPDecrypt

Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443
MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **PGPDecrypt** Function.
Encrypted File Name	The name of the source encrypted file.
Plain Text File Name	The name of the target plaintext file
PGP Key	Select the PGP Key to use for encryption.

Delete Source File	Specify if the source encrypted file is to be deleted.

Function = RunTrigger

Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443
MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **RunTrigger** Function.
Trigger Name	Select the required JSCAPE MFT Server Trigger.
On Rerun Restart All Actions	Check this option to restart Trigger form the beginning when performing a rerun of the task instance, leave unchecked to start from the failed or cancelled Trigger action.

Function = SFTPUpload

Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443
MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **SFTPUpload** Function.
SFTP Host	Specify the remote SFTP server Host Name or IP address.
SFTP Port	Specify the remote SFTP server port.
SFTP Credential	Select the Credential definition to access the remote SFTP server.
Local File Name	Specify the location of the Local File.
Remote Directory	Specify the remote SFTP Server Directory.
Transfer Mode	Specify the Transfer Mode.
Overwrite if File Exists	Check to overwrite destination file(s) if it exists.
Retry Limit	Specify the Maximum Retry Attempts.
Retry Interval	Specify the Interval in Seconds Between Retries.

Function = SFTPDownload

Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443

MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **SFTPDownload** Function.
SFTP Host	Specify the remote SFTP server Host Name or IP address.
SFTP Port	Specify the remote SFTP server port.
SFTP Credential	Select the Credential definition to access the remote SFTP server.
Local File Name	Specify the location of the Local File.
Remote File Name	Specify the remote SFTP File.
Transfer Mode	Specify the Transfer Mode.
Overwrite if File Exists	Check to overwrite destination file(s) if it exists.
Retry Limit	Specify the Maximum Retry Attempts.
Retry Interval	Specify the Interval in Seconds Between Retries.

Function = TradingPartnerUpload

Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443
MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **TradingPartnerUpload** Function.
Trading Partner	Select the JSCAPE MFT Server Trading Partner definition.
Local File Name	Specify the location of the Local File.
Remote Directory	Specify the remote Trading Partner Directory.
Transfer Mode	Specify the Transfer Mode.
Passive Mode	Check to use passive mode.
Retry Limit	Specify the Maximum Retry Attempts.
Retry Interval	Specify the Interval in Seconds Between Retries.

Function = TradingPartnerDownload

Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443

MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **TradingPartnerDownload** Function.
Trading Partner	Select the JSCAPE MFT Server Trading Partner definition.
Local File Name	Specify the location of the Local File.
Remote File Name	Specify the remote Trading Partner File.
Transfer Mode	Specify the Transfer Mode.
Passive Mode	Check to use passive mode.
Retry Limit	Specify the Maximum Retry Attempts.
Retry Interval	Specify the Interval in Seconds Between Retries.

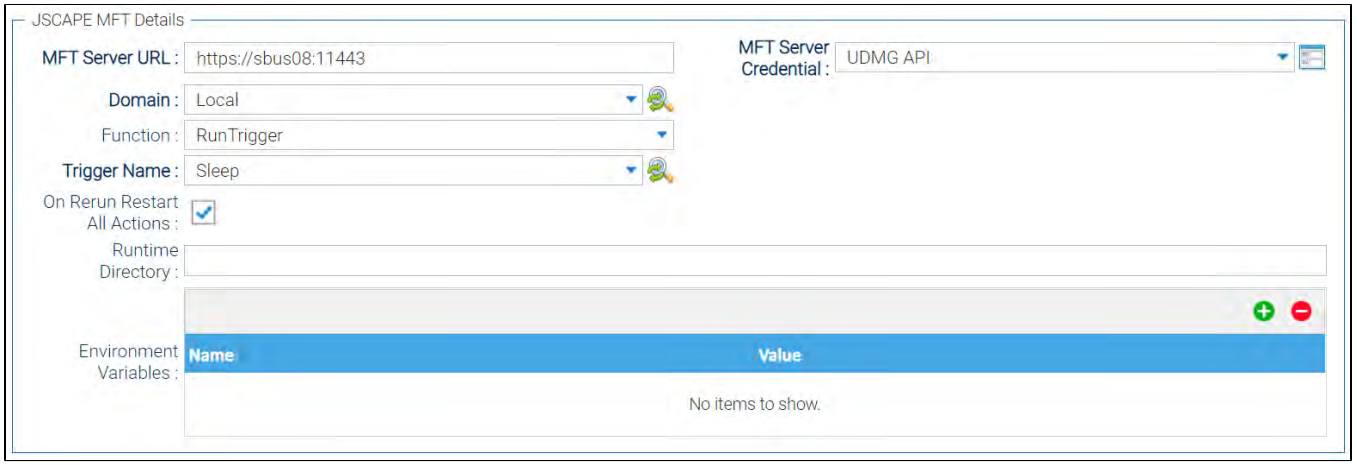
Function = TradingPartnerRegExUpload

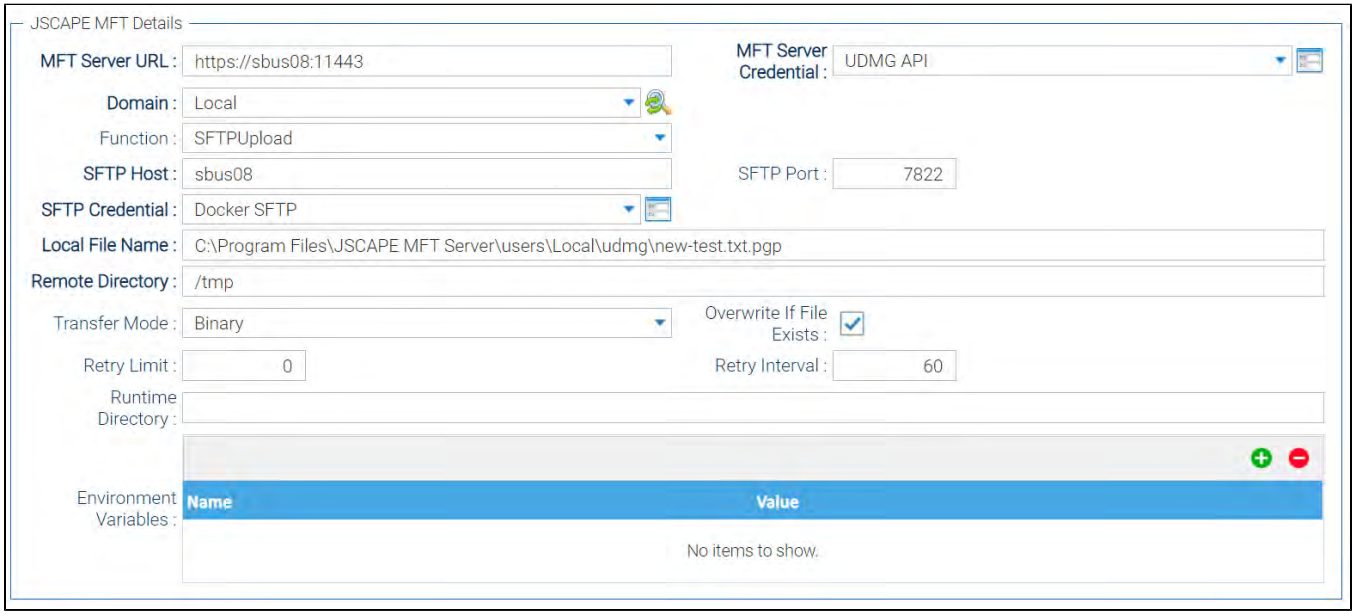
Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443
MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **TradingPartnerRegExUpload** Function.
Trading Partner	Select the JSCAPE MFT Server Trading Partner definition.
Regular Expression / Wildcard	Specify the Regular Expression or Wildcard.
Expression Type	Select either "Regular Expression" or "Widlcard".
Local Directory	Specify the location of the Local File.
Remote Directory	Specify the remote Trading Partner Directory.
Transfer Mode	Specify the Transfer Mode.
Passive Mode	Check to use passive mode.
Fail if No Files Found	Check to fail if no files match the specified expression (Regular Expression or Wildcard).
Delete on Success	Check to delete source files after successful transfer.
Retry Limit	Specify the Maximum Retry Attempts.
Retry Interval	Specify the Interval in Seconds Between Retries.

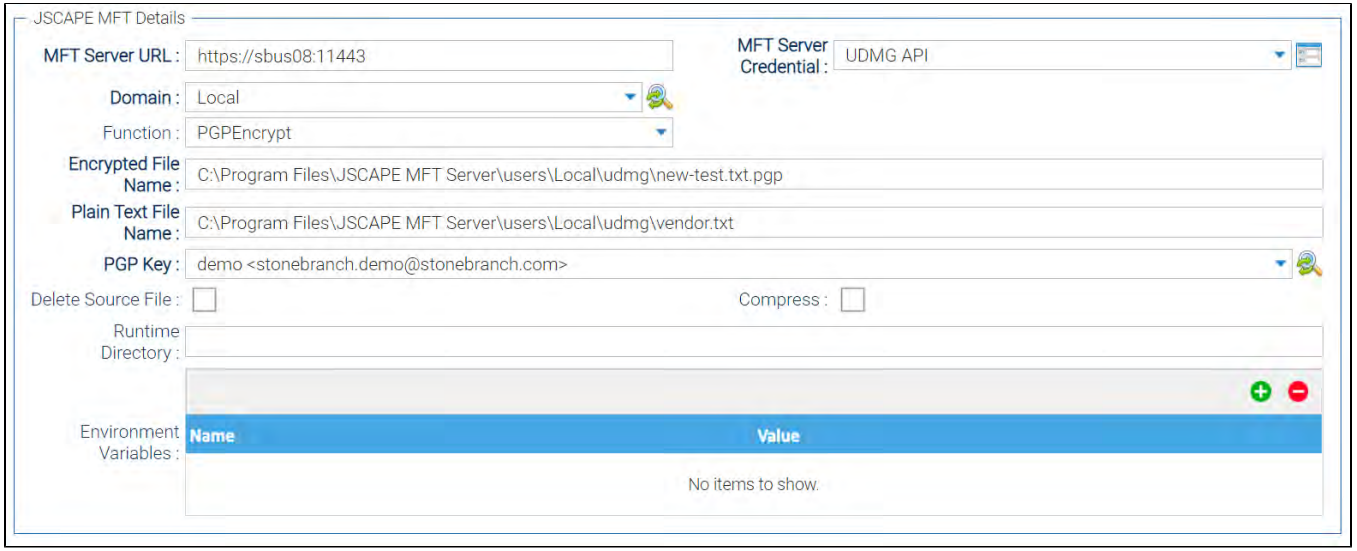
Function = TradingPartnerRegExDownload

Field	Description
MFT Server URL	MFT Server URL i.e. https://localhost:11443
MFT Server Credential	UC credential definition containing a valid JSCAPE MFT Server Administrator username and password.
Domain	Select the required JSCAPE MFT Server Domain name.
Function	Select the **TradingPartnerRegExDownload** Function.
Trading Partner	Select the JSCAPE MFT Server Trading Partner definition.
Regular Expression / Wildcard	Specify the Regular Expression or Wildcard.
Expression Type	Select either "Regular Expression" or "Widlcard".
Local Directory	Specify the location of the Local File.
Remote Directory	Specify the remote Trading Partner Directory.
Transfer Mode	Specify the Transfer Mode.
Passive Mode	Check to use passive mode.
Fail if No Files Found	Check to fail if no files match the specified expression (Regular Expression or Wildcard).
Delete on Success	Check to delete source files after successful transfer.
Retry Limit	Specify the Maximum Retry Attempts.
Retry Interval	Specify the Interval in Seconds Between Retries.

Examples for JSCAPE MFT Universal Tasks


JSCAPE MFT Details
MFT Server URL :
https://sbus08:11443
MFT Server Credential :
UDMG API
Domain :
Local
Function :
RunTrigger
Trigger Name :
Sleep
On Rerun Restart All Actions :
Runtime Directory :
Environment Variables :
Name
Value
No items to show.


JSCAPE MFT Details
MFT Server URL :
https://sbus08:11443
MFT Server Credential :
UDMG API
Domain :
Local
Function :
SFTPUpload
SFTP Host :
sbus08
SFTP Port :
7822
SFTP Credential :
Docker SFTP
Local File Name :
C:\Program Files\JSCAPE MFT Server\users\Local\udmg\new-test.txt.pgp
Remote Directory :
/tmp
Transfer Mode :
Binary
Overwrite If File Exists :
Retry Limit :
0
Retry Interval :
60
Runtime Directory :
Environment Variables :
Name
Value
No items to show.



Document References

This document references the following documents:

Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

Microsoft Teams Integration

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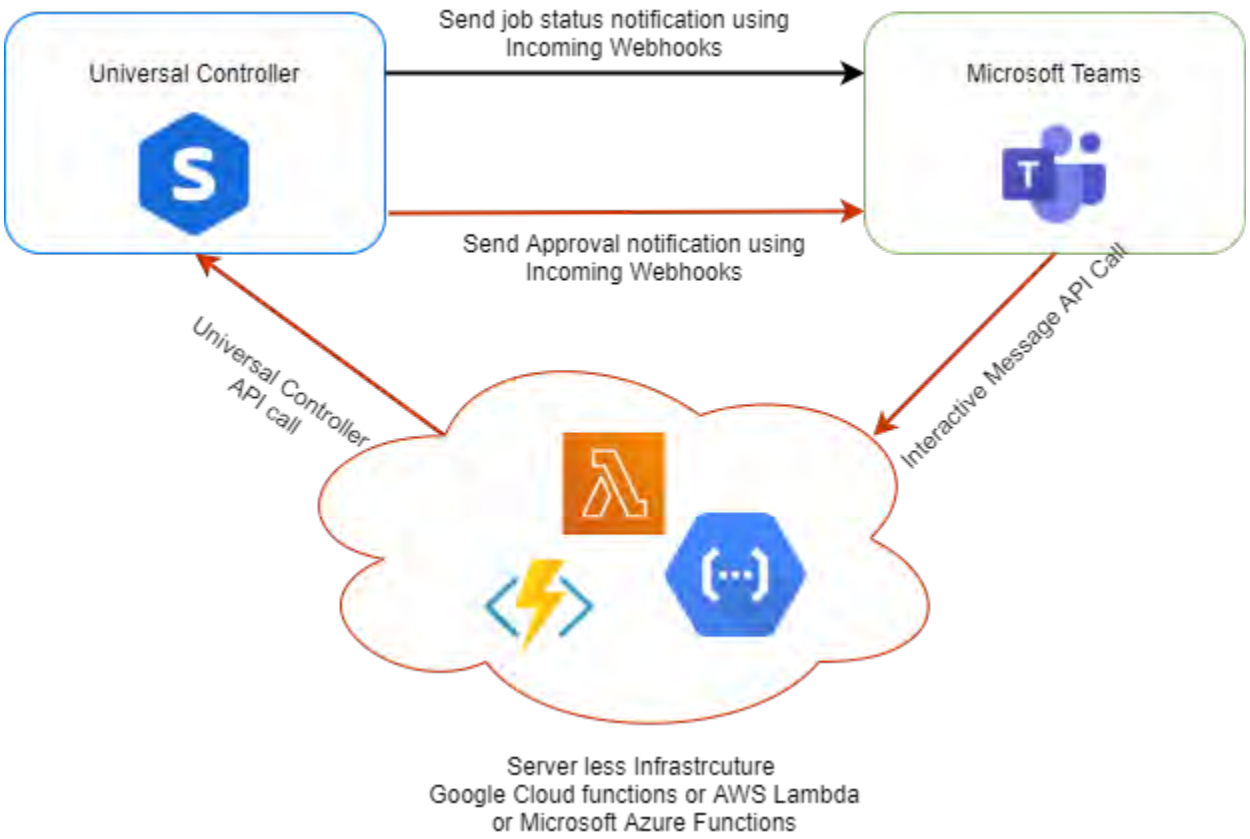
Introduction

This Universal Task allows you to send messages to an existing channel of Microsoft Teams. As a result, you can integrate this solution in UAC to notify users for UAC result or send approval notifications on Microsoft teams.

Overview

Key Features

- Quick reaction time on job failures.
- Manual task interruptions in workflows can be handled by concerned applications/business team, while workflows in Universal Controller can be resumed simply by responding to the approval notifications on Microsoft Teams.



Software Requirements

Software Requirements for Universal Template and Universal Task

This integration requires an Universal Agent and a Python runtime to execute the Universal Task.

- Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests

Software Requirements for Universal Agent

- Universal Agent for Windows x64 Version 6.6.0.0 and later with python options installed
- Universal Agent for Linux Version 6.6.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.6.0.0 and later

Software Requirements for the Application to be Scheduled

The Universal Task requires an Incoming Team channel and a Serverless Infrastructure like AWS Lambda or Google Cloud Functions or Microsoft Azure Functions.

Technical Considerations

Adding an Incoming webhook to a Microsoft Teams Channel

Note

If your MS Team's Settings => Member permissions => Allow members to create, update, and remove connectors is selected, any team member can add, modify, or delete a connector.

1. Navigate to the channel where you want to add the webhook and select (•••) More Options from the top navigation bar.
2. Choose Connectors from the drop-down menu and search for Incoming webhook.
3. Select the Configure button, provide a name, and, optionally, upload an image avatar for your webhook.
4. The dialog window will present a unique URL that will map to the channel. Make sure that you copy and save the URL you will need to provide it to the outside service.
5. Select the Done button. The webhook will be available in the team channel.

Additional Information on How to Use Approval Notification Feature

Manual tasks are typically used when there is a need for manual intervention of user in a workflow process. Traditionally the Manual Task is completed successfully in the Universal controller by clicking “Set Completed” command.

With this Universal Task for Microsoft Teams, we can provide you with a notification in the Microsoft team incoming webhook channel, when the workflow reaches the manual task with status “Action Required”.

Upon receiving the notification on the teams channel, users can click on on the “Approve” Button in the interactive message for the workflow to proceed further. This interactive message is sent from the Universal Controller.

When the “Approve” or “Reject” button is clicked in the interactive message, an API call is made to a function where it can handle the event from the Microsoft Teams. For example we use python function in AWS lambda + API gateway or Azure functions or any custom URL where the Teams messaging platform can make an API POST call to handle the user action in the message as a payload and, based on the posted payload data from the Teams, Universal Controller API call will be made to set the manual task either to set complete status or No action in the function. Please refer to the handler.py file in the serverless function folder for a sample serverless function implementation using AWS lambda.

For Approval Notification feature of the Universal Task, the “API Endpoint” provided in the task details could be an end point either in AWS lambda or Azure Function or GCP function or your custom API end point to handle the interactive message from Microsoft Teams.

Below is the sample python code that could be invoked for the Microsoft Teams Approval Notification. In the code below, update the following variables accordingly under def_handler()

- *teams_incoming_webhook* = *'XXXX'* # The incoming web hook of Microsoft Teams channel
  uname = *'XXXX'* # Universal Controller user name
  passwd = *'XXXX'* # Universal Controller user password
  uc_url = *'http:// + uname + ':' + passwd + '@XXXXXX/resources/taskinstance/setcompleted'* # URL of the Universal Controller

```
import json
import boto3
import logging
from urllib.parse import parse_qs
import requests

logger = logging.getLogger()
logger.setLevel(logging.INFO)


def lambda_handler(event, context):
    print(str(event))
    logger.info(json.dumps(event))
    payload = event['body']
    print(payload)
    jobname_split = payload.split(':')
    jobname = jobname_split[1]
    team_button = jobname_split[0]
    print(team_button)
    print(jobname)
    ###################### Teams Channel Data ################
    teams_incoming_webhook = 'XXXX'
    ###################### End of Teams Channel Data ################
    ############## Credentials for universal controller #################
    uname = 'XXXX'
    passwd = 'XXXX'
    uc_url = 'http://' + uname + ':' + passwd + \
             '@XXXXXX/resources/taskinstance/setcompleted'
    ############## End of Universal Controller Credentials #################
    # Posting request to Universal Controller
    uc_post_request(team_button, jobname, uc_url, teams_incoming_webhook)
    ################## Teams data parsed -completed ############################
    body = {
        "message": "Teams Data parsed successfully and Universal controller ""confirmed the job !",
        "input": event
    }
    response = {
        "statusCode": 200,
        "body": json.dumps(body)
    }
    return response


def uc_post_request(team_button, jobname, uc_url, teams_incoming_webhook):
    header = {'content-type': "application/json"}
    if team_button=="Approved":
        print("Intiating Request to Universal Controller")
        approval_message = {
            "name": jobname,
            "criteria": "Newest Instance"
        }
        print(uc_url)
        post_uc = requests.post(uc_url, data=json.dumps(approval_message),
            headers=header)
        # print(post_uc.text)
```

```
        if post_uc.status_code==200:
            format_response = post_uc.json()
            logger.info(format_response)
            if format_response['success'] is False:
                print("Something went wrong")
                error_message = {
                    "@type": "MessageCard",
                    "@context": "https://schema.org/extensions",
                    "summary": "This is the summary property",
                    "themeColor": "#FFFF00",
                    "sections": [
                        {
                            "activityTitle": "**Couldn't not reach**",
                            "activitySubtitle": "Something went wrong, ""action not completed"
                        }
                    ]
                }
                print("Sending error report to MS Teams Channel")
                uc_response = requests.post(teams_incoming_webhook,
                    data=json.dumps(error_message),
                    headers={'CARD-UPDATE-IN-BODY': 'True',
                             'Content-Type': 'application/json'})
            elif format_response['success'] is True:
                print("Your request is approved")
                approval_response = {
                    "@type": "MessageCard",
                    "@context": "https://schema.org/extensions",
                    "summary": "This is the summary property",
                    "themeColor": "#008000",
                    "sections": [
                        {
                            "activityTitle": "**Approved**",
                            "activitySubtitle": "Request was approved after ""review"
                        }
                    ]
                }
                header = {
                    'content-type': 'application/json'
                }
                print("Sending Notification to MS Teams Channel")
                uc_response = requests.post(teams_incoming_webhook,
                    data=json.dumps(approval_response), headers=header)
                format_response = json.loads(uc_response.text)
                print(format_response)
    elif team_button=="Rejected":
        print("Reqeust Denied")
        reject_response = {
            "@type": "MessageCard",
            "@context": "https://schema.org/extensions",
            "summary": "This is the summary property",
            "themeColor": "#FF0000",
            "sections": [
                {
                    "activityTitle": "**Rejected**",
                    "activitySubtitle": "Request was rejected after review"
                },
            ]
        }
        print("Sending Notification to MS Teams Channel")
        uc_response = requests.post(teams_incoming_webhook,
            data=json.dumps(reject_response),
            headers={'CARD-UPDATE-IN-BODY': 'True',
```

```
                'Content-Type': 'application/json'})
print("Teams Response: ", uc_response.status_code)
```

Microsoft Teams Integration

Key Features

Feature	Description
Send Message	With Send Message function we can send a notification message to the Microsoft Teams channel with the current task instance details such as job failure, late start/run, and other important events.
Approval Notification	With Approval notifications, an interactive message is sent to the Microsoft Teams incoming channel. The user can chose to Approve or Reject the continuation of workflow execution.

Import Microsoft Teams Integration Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Microsoft Teams IntegrationUniversal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

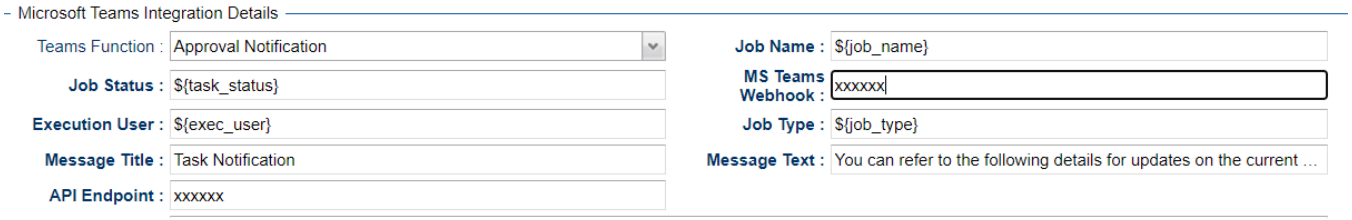
Field Descriptions for Microsoft Teams Integration Universal Task

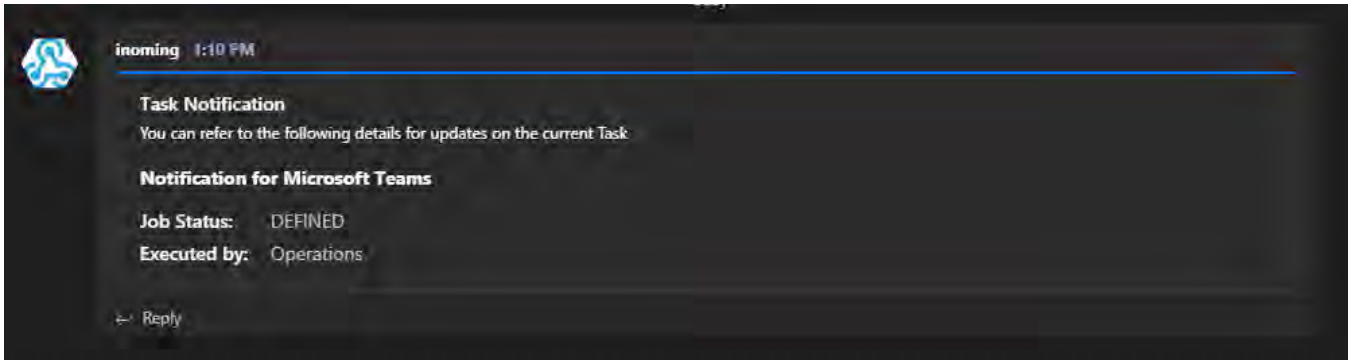
Field	Description
Send Message	
Teams Function	Send Message or Approval Notification.
Job Name	Name of the job, by default it takes the current job name ${ops_task_name}.
Job Status	Status of the job, by default it takes the current job name ${ops_status}.
MS Teams Webhook	The incoming web hook of Microsoft Teams channel.
Execution User	Details of the execution user, by default takes the current user name ${ops_execution_user}.

Job type	Task type of task instance, by default takes the current task instance type ${ops_task_type}.
Message Title	The title of the message sent to Microsoft Teams channel.
Message Text	The text of the message sent to Microsoft Teams channel.
Approval Notification	
API Endpoint	URL of the Serverless infrastructure endpoint.

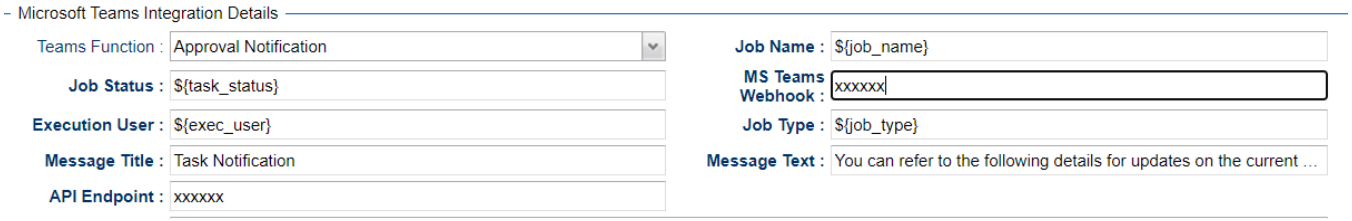
Examples for Microsoft Teams Integration Universal Tasks

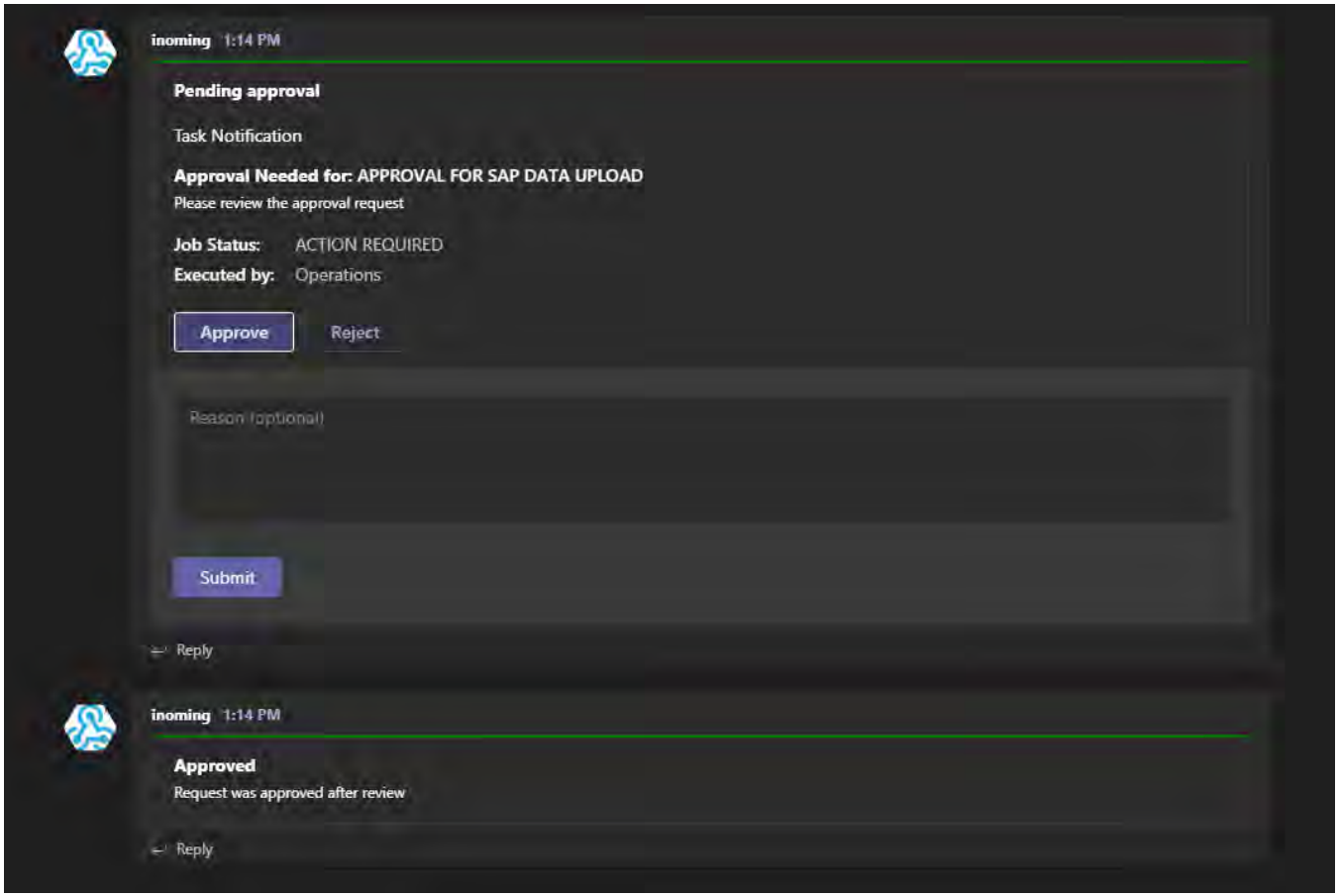
Send Message





Approval Notification





Document References

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Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.
Microsoft Teams Wenhooks	https://docs.microsoft.com/en-us/microsoftteams/platform/webhooks-and-connectors/how-to/add-incoming-webhook	User documentation for creating incoming webhooks in Microsoft Teams Channel.
Requests	https://pypi.org/project/requests/#description	Documentation for python requests module.

PagerDuty

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- Import PagerDuty Integration Built-In Universal Template
- Configure PagerDuty Integration Universal Task
- Field Descriptions for PagerDuty Integration Universal Task
- Examples for PageDuty Integration Universal Tasks
  - Create Incident in PagerDuty
  - List Incidents in PagerDuty
  - PagerDuty Update Incident Note
  - Create Event in Pager Duty
  - Create User in PagerDuty
  - Delete User in PagerDuty
- Document References

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Introduction

This Universal Task allows Stonebranch users to notify PagerDuty (Incident management platform) in the event of job Failure or long run of a job or Early finish of a job or any other event in Universal Controller. Furthermore, PagerDuty can help to aggregate alerts and group them, and provide reliable notifications, automatic escalations and on-call scheduling that could help fix support issues quickly.

Overview

Users can orchestrate the following functionalities in PagerDuty using this Universal Task:

- PagerDuty Incident

    - Create Incident
    - List Incidents
    - Update Incident Notes
- PagerDuty Event
    - Create PagerDuty Event
- PagerDuty User Management
    - Create a user in PagerDuty
    - Delete a user in PagerDuty

Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against PagerDuty.

Software Requirements for Universal Template and Universal Task

Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.

- Python modules required
    - requests

Software Requirements for Universal Agent

- Universal Agent for Windows x64 Version 6.6 and later with Python options installed
- Universal Agent for Linux Version 6.6 and later with Python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.6.0.0 and later

Software Requirements for the Application to be Scheduled

This Universal Task has been tested with PagerDuty REST API V2 for incidents functionalities ,User creation & deletion and Events API V2 for event creation in PagerDuty.

Technical Considerations

- This task uses Python modules requests to make REST-API calls to the PagerDuty environment.
- PagerDuty API URL ,API token and PagerDuty user email would be required as basic input for this Universal Task.
- Refer to PagerDuty API URL: https://developer.pagerduty.com/api-reference/

Key Features

Feature	Description
Create Incident	This feature helps to create an incident in PagerDuty for an event in Universal Controller; for example: Job Failure or Job running longer.

List Incidents	List Incidents that are in PagerDuty with status triggered or resolved or acknowledged for a PagerDuty service ID.
Update Incident notes	Update a work note for an existing incident in PagerDuty.
Create Event	Create an event in PagerDuty; Specifying the details of the event in Universal Controller; severity, Job Name, Job Type, Description, Event Action.
Create User	Creates an user account in PagerDuty.
Delete User	Deletes an user account in PagerDuty.

Import PagerDuty Integration Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure PagerDuty Integration Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

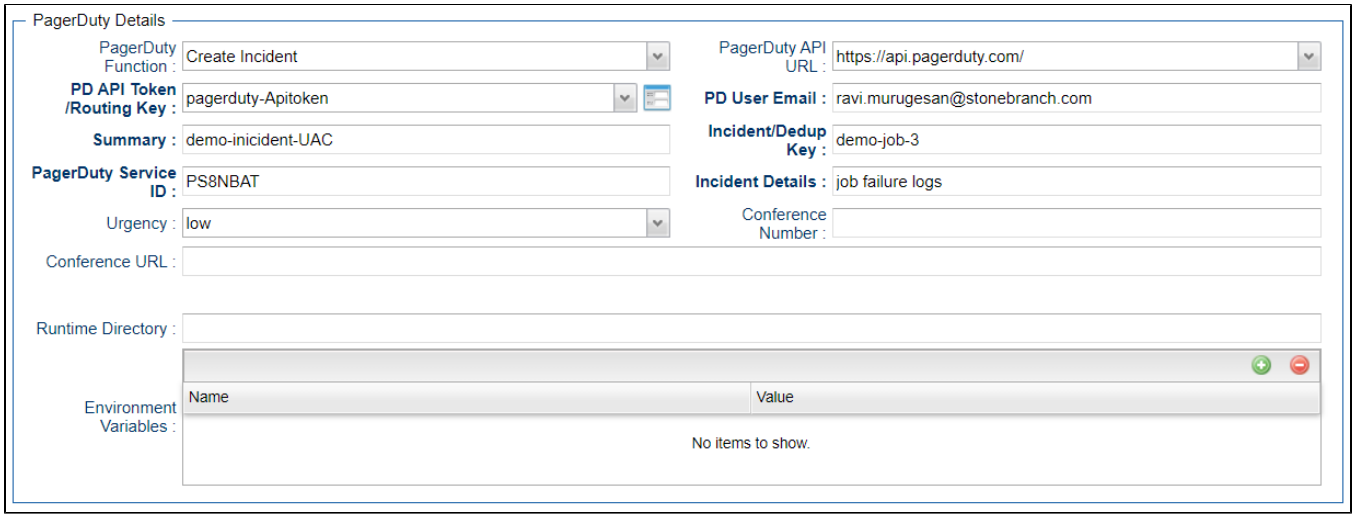
Field Descriptions for PagerDuty Integration Universal Task

Field	Description
PagerDuty Function	Select the functions that needs to be performed in PagerDuty.
PagerDuty API URL	For Event creation select : https://events.pagerduty.com/v2/enqueue and other functionality select : https://api.pagerduty.com/.
PD API Token /Routing Key	Provide the API token for incident and routing key for Event creation.
PD User Email	Provide the valid Pager Duty user Email address.
Summary	specify the incident title or an event summary.
Incident/Dedup Key	Provide an Incident key for PagerDuty incident E.g: Universal Controller job name.
PagerDuty Service ID	Service ID in PagerDuty where the incident needs to be created.
Incident Details	Provide the incidents that needs to be in pager duty.
Urgency	Select the urgency of the event in Universal Controller.
Conference Number	Conference Bridge Details for the meeting (Incase if the support needs to gets in to conference call).
Conference URL	URL for the conference meeting.

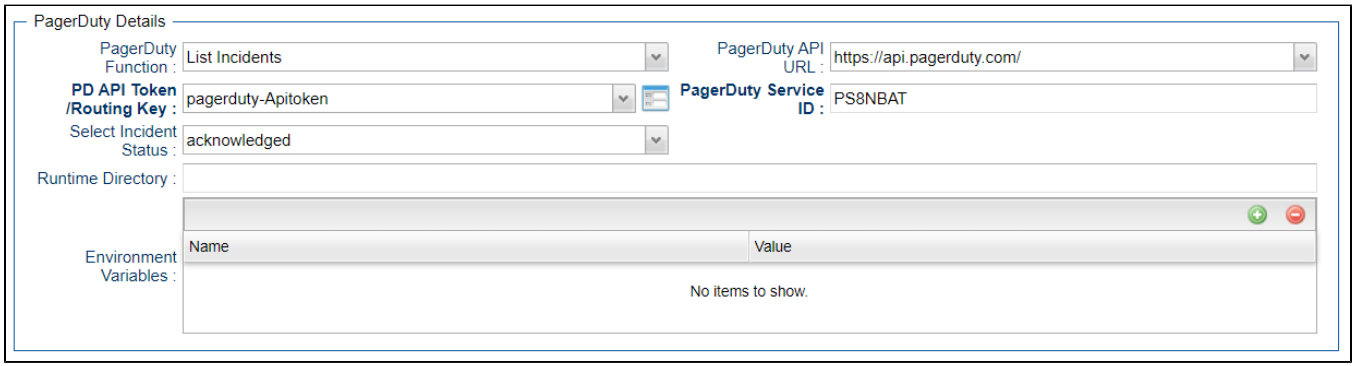
Incident ID	Provide the PagerDuty incident ID (Incase where the PagerDuty Incident note needs an update).
Incident Note	Include the note that needs to be updated for the incident.
Select Incident Status	Select the status for which the incident details needs to be retrieved from PagerDuty.
Event Action	Select the appropriate event Action trigger or acknowledge or resolve.
Severity	Select either one of the status that would be appropriate (Critical, Error, Warning, and Info).
Event Source System	The unique location of the affected system, preferably a hostname or FQDN.
Job Type	provide the job type which will fit in the component field of the pager duty event.
Job Status	Job status that will fit in to the class field for the pager duty event creation.
User ID	PagerDuty User ID.
Name	Name of the PagerDuty user.
User Email Address	User's Email Address.
Job Title	Provide the Job title of the user.
User Role	The role of the user; for example, administration.
Time Zone	Specify the user time zone.
Summary	Summary about the user creation request.

Examples for PageDuty Integration Universal Tasks

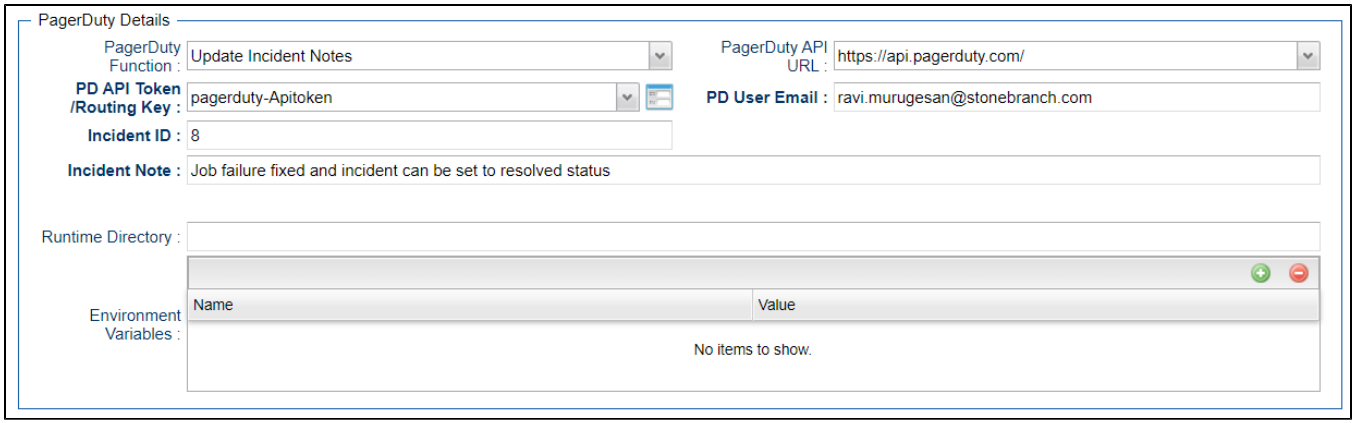
Create Incident in PagerDuty



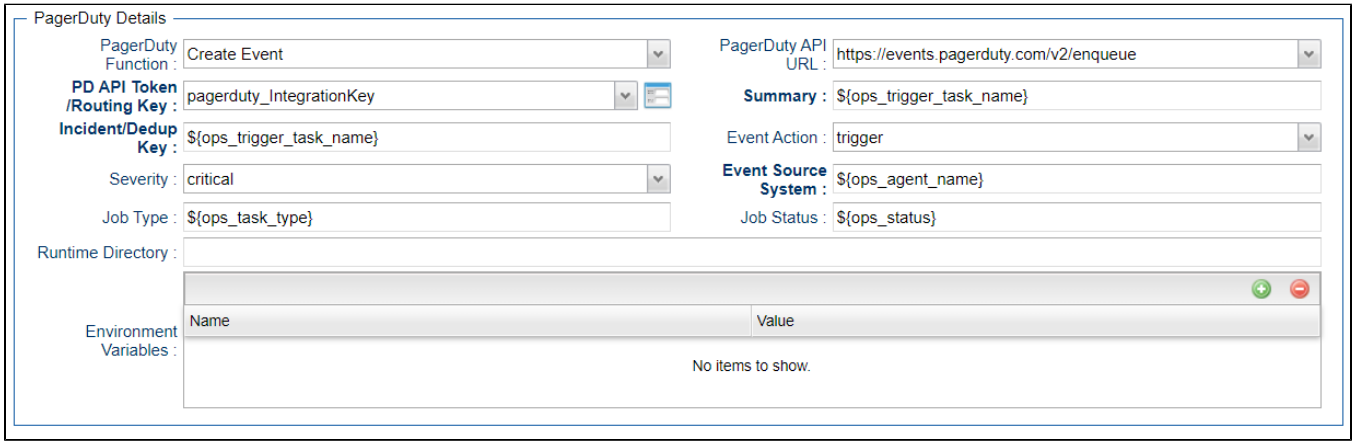
List Incidents in PagerDuty



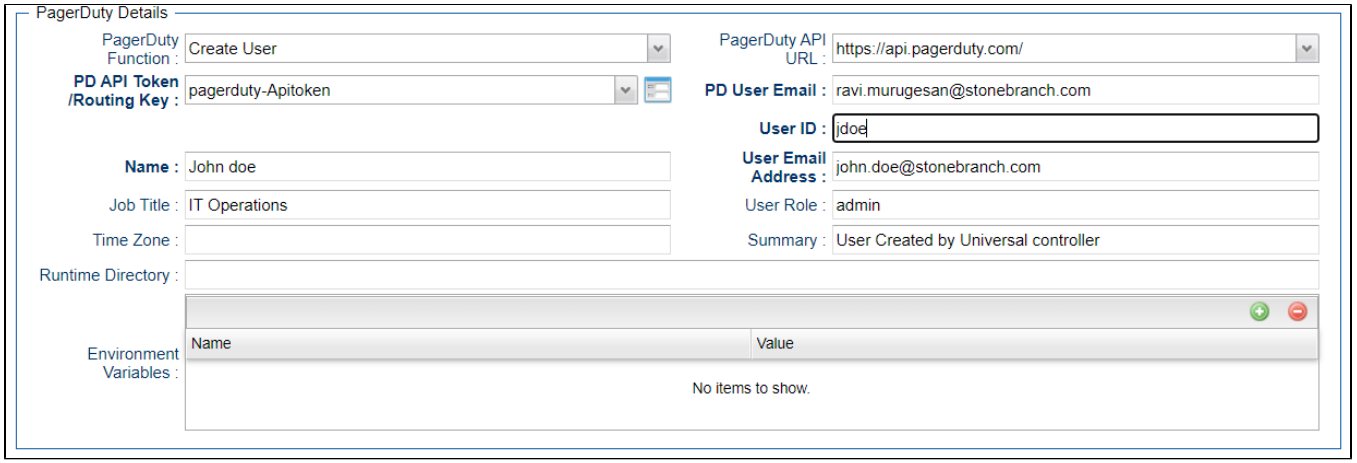
PagerDuty Update Incident Note



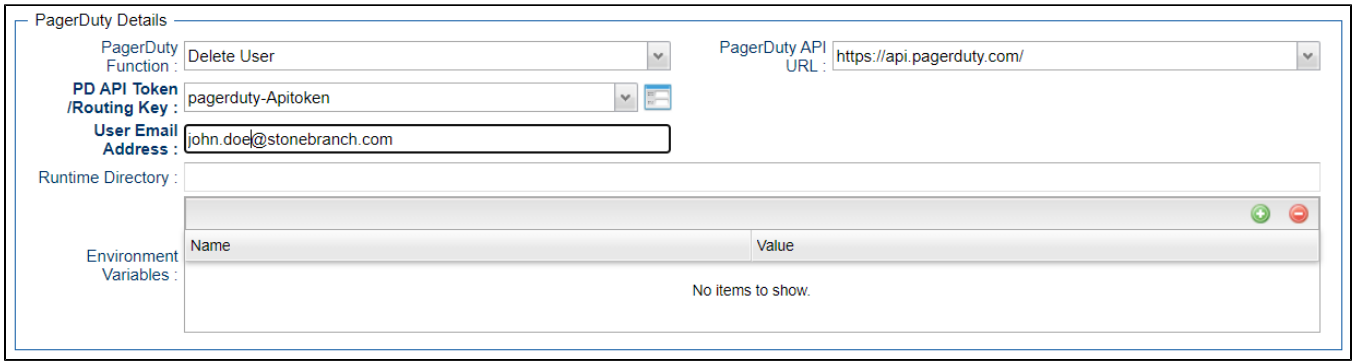
Create Event in Pager Duty



Create User in PagerDuty



Delete User in PagerDuty



Document References

This document references the following documents:

Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

Salesforce

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Introduction

This Universal Task allows users to create contact and lead objects in Salesforce, as well as execute Salesforce Object Query Language (SOQL) queries.

Overview

- Allows advanced automation by enabling creation of Salesforce objects, such as Contact and Leads, from the Universal Controller in combination with event-based triggers.
- Uses the Salesforce Object Query Language (SOQL) to search your organization’s Salesforce data for specific information.
- SOQL is similar to the SELECT statement in the widely used Structured Query Language (SQL), but is designed specifically for Salesforce data.
- With SOQL, users can construct simple but powerful query strings and execute them from within the Universal Controller.

Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against a remote ServiceNow instance.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - simple-salesforce

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 6.9.0.0 and later with python options installed
- Universal Agent for Linux Version 6.9.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.9.0.0 and later

Software Requirements for the Application to be Scheduled

The simple-salesforce Python module uses the Lightning Platform REST API. Salesforce supports each API version for a minimum of three years from the date of first release.

The module is also updated regularly to add features and support new API versions.

Universal Task Description

Key Features

Feature	Description
Create Contact, Lead	Create Contact and Lead objects in Salesforce. Combine with event-based triggers or use within workflows to create these objects as a result of events or predecessors.
Execute SOQL query	Query the Salesforce Database using the flexible querying language SOQL. Uses the Universal Controller script library to store and maintain SOQL scripts.

Please note: More functions can easily be added to this Universal Task, based on the available functionality of the simple-salesforce Python module. More fields to hold more information on; for example, Leads or Contacts can also be added to the Universal Template.

Import Salesforce Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Salesforce Universal Task

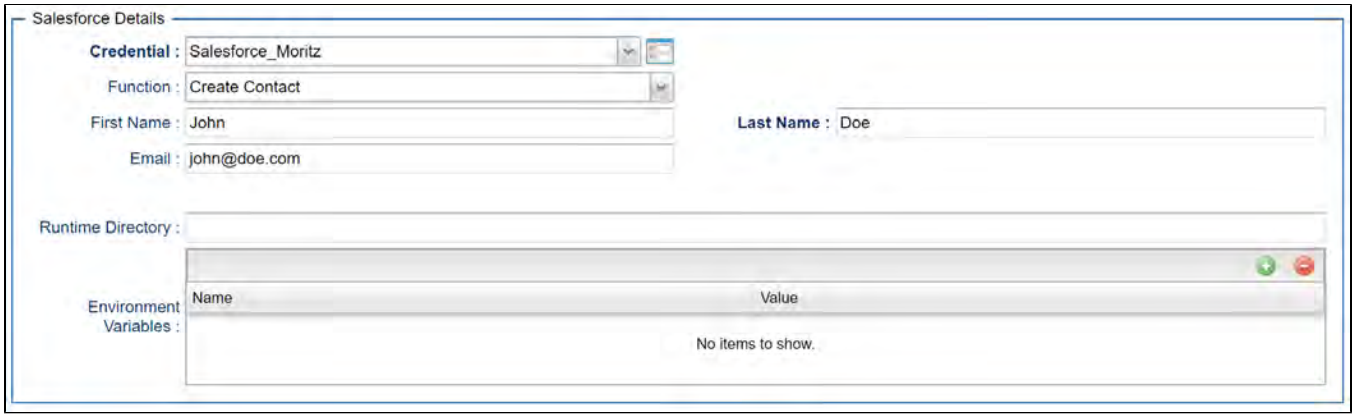
For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

Field Descriptions for Salesforce Universal Task

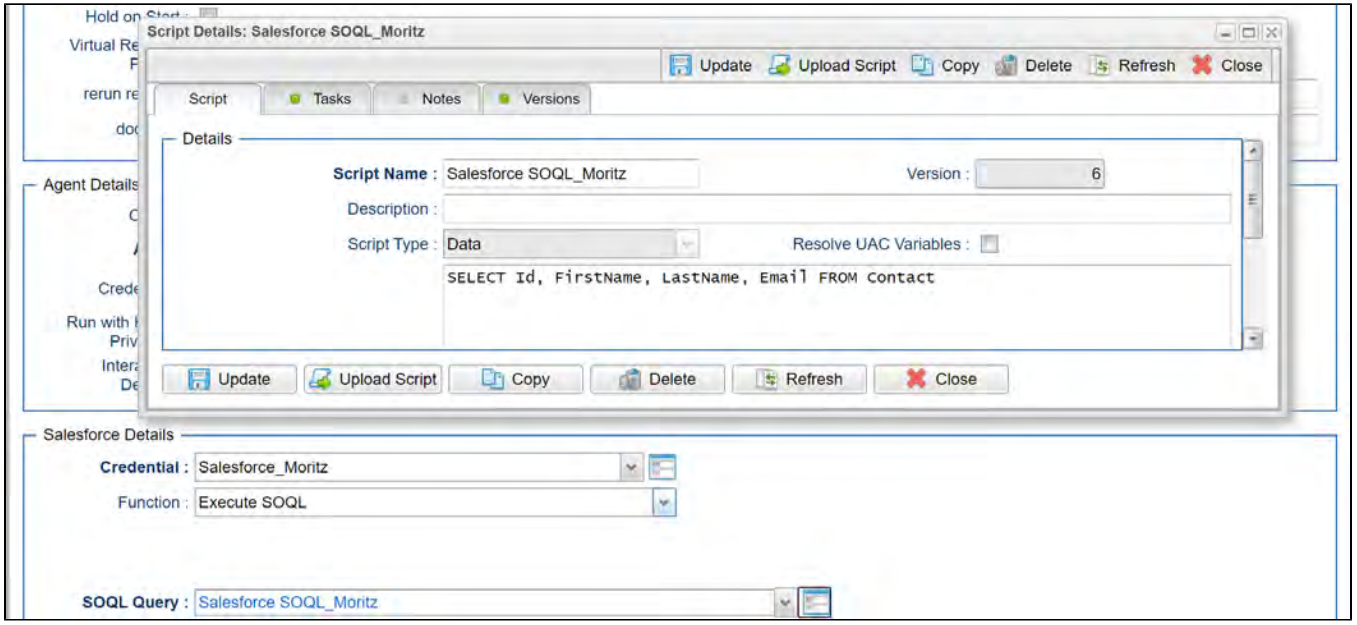
Field	Description
Credential	Username, Password and Security Token for your Salesforce user. Please use the "Passphrase" field for the Security Token.
Function	Select between the available functions of this Universal Task.
First Name	First name of the contact to be created.
Last Name	Last name of the contact to be created.
Email	Email address of the contact to be created.
SOQL Query	Script field. Stores the SOQL Query to be executed as a script in the internal script library.

Examples for Salesforce Universal Tasks

Create Contact



Execute SOQL



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Name	Location	Description
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SAP Calendar Import

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- Configure SAP Calendar Definitions Task
- Field Descriptions for the SAP Calendar Import Definitions Task
- Example: SAP Import SAP Calendar - Application Server Connection
- SAP Calendar Import Name
  - Example

Disclaimer

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Overview

This Universal Task allows you to import the SAP Factory Calendar and the related Holiday Calendar into the Universal Controller.

You can either import a user-defined list of SAP calendar using a csv file or all valid SAP calendar. The Calendar Import can be scheduled to be always in sync with SAP; for example, import all Calendar every day. It is also possible to import Calendars from different SAP System.

Software Requirements

Software Requirements Universal Agents and Controller

- Universal Agent for Linux or Windows Version 6.9.0.0 or later are required

Software Requirements Universal Controller

- Universal Controller 6.9.0.0. or later is required
- A Universal Controller license key with support for SAP connector is required

Software Requirements for the Application to be scheduled

In order to connect to the SAP System the SAP NetWeaver RFC SDK 7.50 libraries are required from SAP.

Those can be downloaded from the SAP Software Download: SAP NetWeaver RFC SDK 7.50

Universal Task for SAP Calendar Import Key Features

Some details about the Universal Tasks for SAP Calendar Import:

- The Universal Task imports either a user defined csv-list or all SAP Factory- and related Holiday Calendar, which match the configured selection criteria into the Universal Controller.
- The Calendar Import can be scheduled to be always in sync with SAP e.g. import all Calendar every day
- The csv list is saved incl. Versioning into the Universal Controller script library
- The Universal Task runs on Linux as well as Windows Universal Agents
- The calendar export is done using the SAP certified XBP-RFC interface
- SAP is always considered as the Master; Calendars are always export from SAP, never import to SAP.
- All Calendar functionalities are support incl. Factory, Holiday and “Special Rules”
- Calendar can be imported from different SAP System - automatically the SID and Client of the SAP, where the import was done is added as a Postfix to the imported Calendar
- You can set different log-levels for the Universal task, providing you more information in case of issues
- Support for Application Server Connection and Destination Connection (nwrfc.ini) e.g. Load Balancer connections, SAP SNC, etc.

Import SAP Calendar Import Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure SAP Calendar Definitions Task

For the new Universal Task type, create a new task and enter the task-specific Details that were created in the Universal Template.

Field Descriptions for the SAP Calendar Import Definitions Task

Field	Description
Universal Controller URL	Universal Controller URL; for example, Local Universal Controller: http://192.168.88.10:8080/uc/ Stonebranch SaaS Cloud Universal Controller:

	https://superstore.stonebranchdev.cloud/
Universal Controller Credentials	Credentials of the Universal Controller Webservice API
Import All Calendar	Yes | No If “Yes” is selected all SAP Calendar based on the selection criteria entered in the fields: Start Year and Years are imported. If “No” is selected the Calendar provided in the Calendar Input File will be imported to Universal Controller
Start Year	From this year onwards the Calendar will be imported from SAP. Example: Start Year = 2020, Years = 2 will import all calendar starting from 2020 until 2022
Years	Number of years to import starting from the year provide in the field Start Year.
First Day of Week	[Monday,Tuesday, Wednesday, Thursday, Friday, Sunday] Set the first day of the week for the calendar

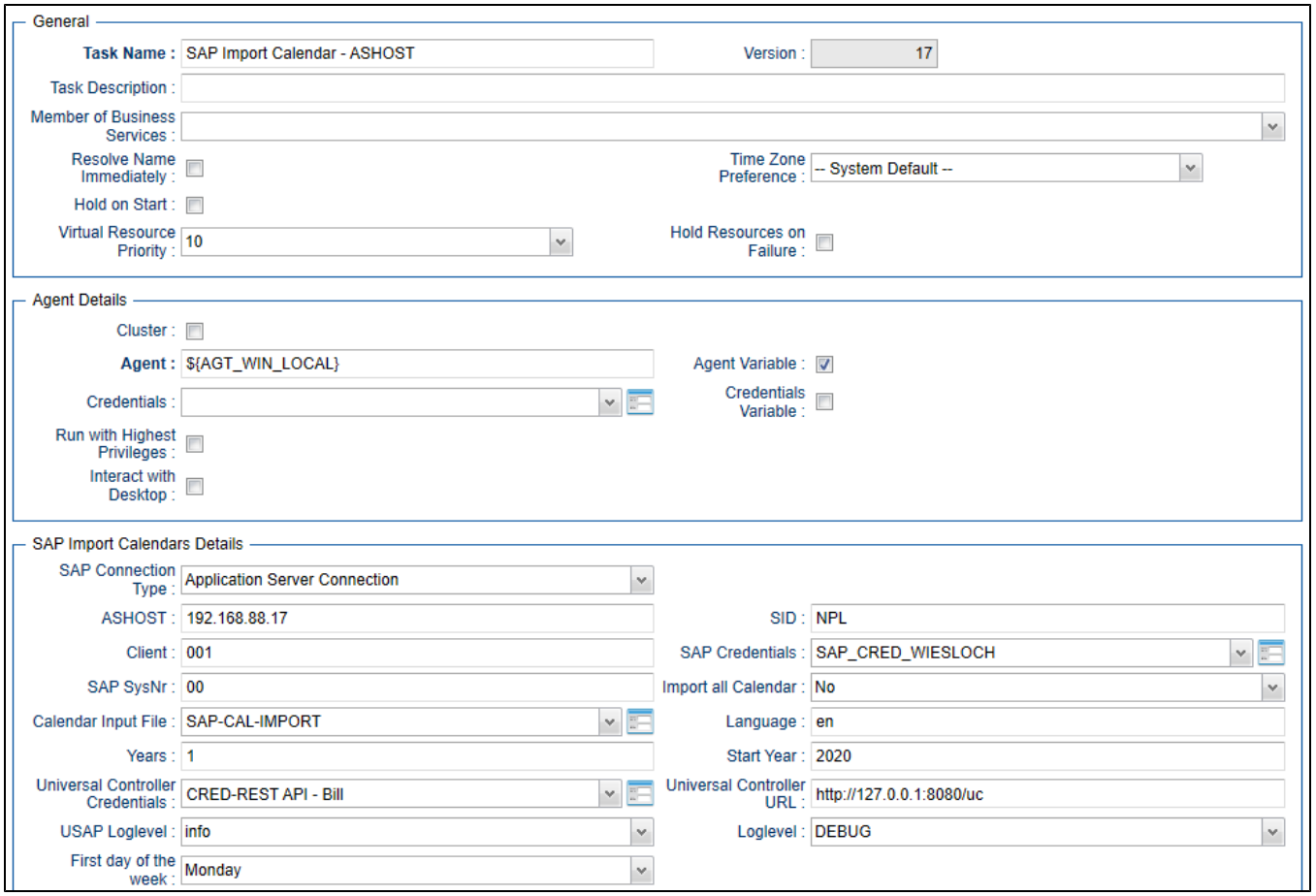
Calendar Input File	This field is only used when the choice field import all calendar is set to No.
	
	The Calendar Input File file has the following structure:
	
	NOTE: If a factory calendar has no holiday calendar, then leave the filed empty; for example, 02, means extract factory calendar 02 without a holiday calendar.
	
	The format is:
	
	<Factory Calendar ID>,<Holiday Calendar ID>
	
	Example: calendar_import.csv
	
	`factory_calid,holiday_calid`
	`01,08`
	`02,`
	`AJ,04`

Language	SAP Language e.g. EN for English
SAP Connection Type	[Application Server Connection | NRFW.ini Connection)] Select the SAP Connection Type: Application Server Connection or Destination Connection using the nwrfc.ini file. Default location for the nwrfc.ini file is: • Linux: /opt/universal/uagsrv • Windows: C:\Program Files\Universal\UAGSrv
SAP Credentials	Credentials of the SAP System
SAP ASHOST	SAP Application to connect to. This field is only visible in case of SAP Connection Type = “Application Server Connection”
SID	SAP System Identifier (3 digits); for example, NPL

	The Imported calendar will have the SID as prefix Imported Calendar Name: <**SID**>_<SAP CLIENT>_<SAP CALENDAR ID>
SAP CLIENT	SAP Client (3 digits); for examaple, 100 The Imported calendar will have the SID as prefix Imported Calendar Name: <SID>_<**SAP CLIENT**>_<SAP CALENDAR ID>
SAP SysNr	SAP System Number (2 digits) e.g. 00
SAP Destination	SAP Destination in the nwrfc.ini. This field is only visible in case of SAP Connection Type = "*NRFW.ini Connection*"
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]
USAP loglevel	Loglevel of the Universal Connector for SAP trace | audit | info | warn | error

Calendar Input File	This field is only used when the choice field import all calendar is set to No.
	The Calendar Input File file has the following structure:
	NOTE: If a factory calendar has no holiday calendar, then leave the filed empty; for example, 02, means extract factory calendar 02 without a holiday calendar.
	The format is:
	<Factory Calendar ID>,<Holiday Calendar ID>
	Example: calendar_import.csv
	`factory_calid,holiday_calid`
	`01,08`
	`02,`
	`AJ,04`

Example: SAP Import SAP Calendar - Application Server Connection



SAP Calendar Import Name

The Imported calendar will have the following naming in Universal Controller:

<SID>_<**SAP CLIENT**>_<SAP CALENDAR ID>

Example

NPL_100_01

SID = NPL, CLIENT = 100, SAP Factory Calendar ID = 01

SAP Extract Job Definitions

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  - Software Requirements Universal Controller
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- Configure SAP Extract Job Definitions Task
- Field Descriptions for the SAP Extract Job Definitions Task
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- Example: SAP Extract Job Definition - Destination Connection (nwrfc.ini)
- Execute SAP Extract Job Definitions Task
  - Extracted Job Definitions
  - Log-file Example

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Overview

This Universal Task allows you to export SAP Job definitions from SAP into one flat file for each Job selected for extraction. The Jobs definitions to extract from SAP are provided in a CSV input file saved in the Universal Controller script library. For each Job to extract the SAP Jobname and SAP Job count ID needs to be provided in the input file.

The extracted SAP Job definition files can then by read by the Stonebranch Conversion Tool (CTK), which transitions each read Job definition file into an SAP Task. If the SAP Job was in status Released, meaning Start conditions had been defined in SAP for that Job, than automatically a time trigger with the scheduling criteria will be created by the transition tool. As result the transitioned SAP Task are ready to be scheduled in the same way as in SAP.

This document focuses on the Universal Task, which extracts the Job definitions from SAP. The Stonebranch Conversion Tool (CTK) to read the extracted Job definitions files and create SAP Tasks and related trigger from it is described in the CTK documentation.

Software Requirements

Software Requirements Universal Agents and Controller

- Universal Agent for Linux or Windows Version 6.9.0.0 or later are required

Software Requirements Universal Controller

- Universal Controller 6.9.0.0. or later is required
- A Universal Controller license key with support for SAP connector is required

Software Requirements for the Application to be Scheduled

In order to connect to the SAP System the SAP NetWeaver RFC SDK 7.50 libraries are required from SAP.

Those can be downloaded from the SAP Software Download: SAP NetWeaver RFC SDK 7.50

SAP Extract Job Definitions Key Features

- EDxport SAP Job definitions from SAP into one flat file for each SAP Job
- Also any defined start criteria will be exported for SAP each Job
- Jobs to be extracted can be in any Status (for example, SCHEDULED, RELEASED, CANCELED, FINISHED)
- The Jobs to be extracted are provide via list saved in the Universal Controller script library
- A detailed log file will be provided after each extraction process to identify Jobs which could not be found in SAP; for example, a Jobname has been provided in the input file, which does not exists in the SAP System
- The extracted SAP Job definition files can than by read by the Stonebranch Conversion Tool (CTK), which transitions each read Job definition file into an SAP Task, including defined Start criteria
- Support for Application Server Connection and Destination Connection (nwrfc.ini); for example, Load Balancer connections, SAP SNC)

Import SAP Extract Job Definitions Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure SAP Extract Job Definitions Task

For the new Universal Task type, create a new task and enter the task-specific Details that were created in the Universal Template.

Field Descriptions for the SAP Extract Job Definitions Task

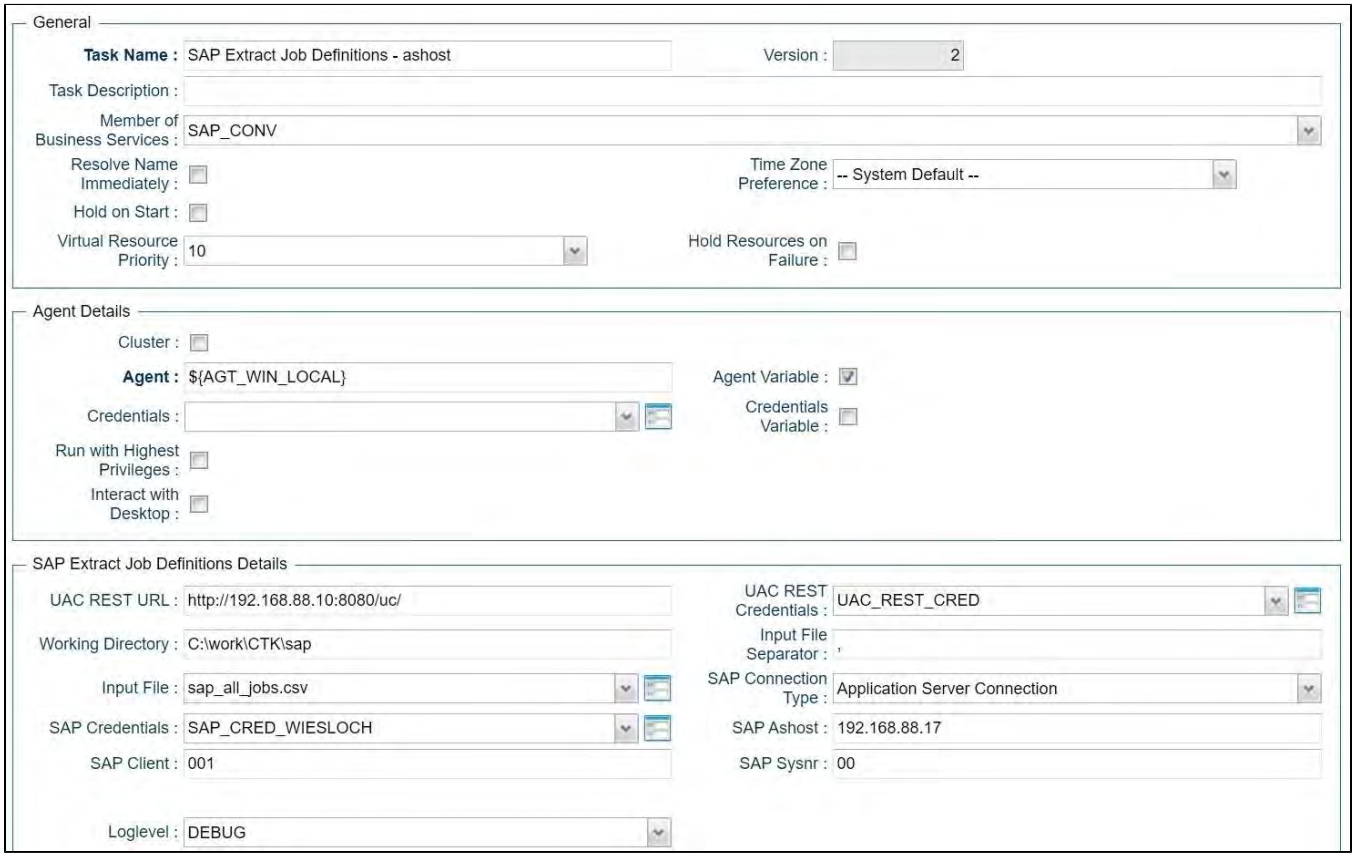
Field	Description
UAC REST URL	Universal Controller URL; for example: Local Universal Controller: http://192.168.88.10:8080/uc/ Stonebranch SaaS Cloud Universal Controller: https://superstore.stonebranchdev.cloud/
UAC REST Credentials	Credentials of the Universal Controller Webservice API
Working Directory	Any Linux or Windows directory, which will be used to store the extracted Job definitions in. The directory must exist on the server where the Universal SAP Connector Agent is installed. Examples: • Windows: C:\work\CTK\sap • Linux: /home/stone/work/CTK/sap
Input File Separator	This field contains the Input File Separator used in the Input File; for example, “,” or “;”

Input File	Input file containing the SAP Jobs to extract.
	
	The format is:
	
	<SAP Jobname >,<SAP Jobcount ID>
	
	Example: sap_jobs.csv
	
	`SAP-CTK-01_EVERYDAY_1000,15444900`
	`SAP-CTK-02_FDOM_1000,16483700`
	`SAP-CTK-03-WORDAY-1000,09063600`
	`SAP-CTK-04-EVERYDAY,11290200`
	`SAP-CTK-04_MULTISTEP_EVERYHOUR,17402500`

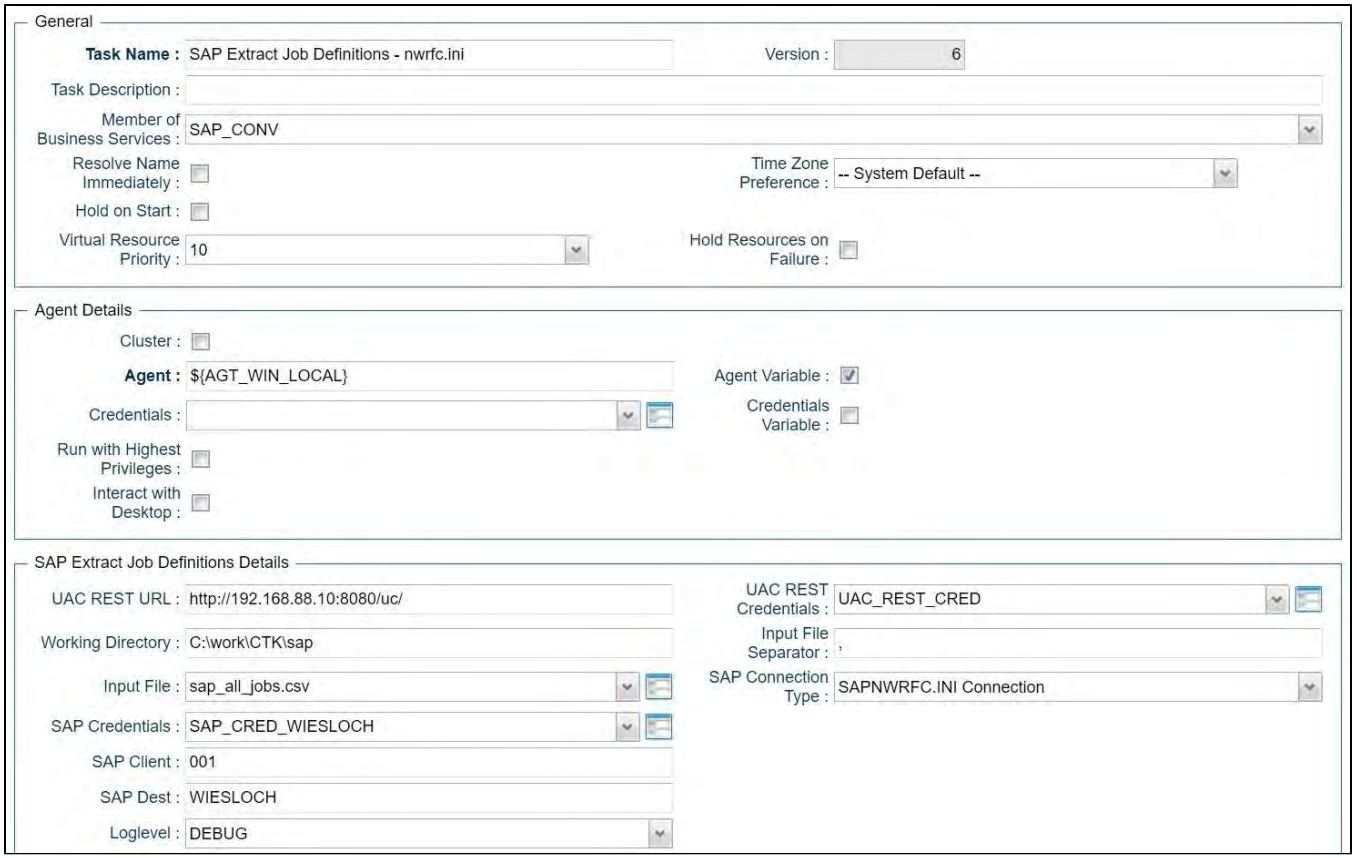
SAP Connection Type	[Application Server Connection | NRFW.ini Connection)] Select the SAP Connection Type: Application Server Connection or Destination Connection using the nwrfc.ini file. Default location for the nwrfc.ini file is: • Linux: /opt/universal/uagsrv • Windows: C:\Program Files\Universal\UAGSrv
SAP Credentials	
SAP ASHOST	SAP Application to connect to. This field is only visible in case of SAP Connection Type = “Application Server Connection”

SAP CLIENT	SAP Client e.g. 100
SAP Sysnr	SAP System Number; for example, 00
SAP Dest	SAP Destination in the nwrfc.ini. This field is only visible in case of SAP Connection Type = "*NRFW.ini Connection*"
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

Example: SAP Extract Job Definition - Application Server Connection



Example: SAP Extract Job Definition - Destination Connection (nwrfc.ini)



Execute SAP Extract Job Definitions Task

When you launch the SAP Extract Job Definitions Task it will connect to the provide SAP System an extract the Job definition to one flat file per SAP Job. In addition the a log-file will be generated, showing you if all SAP Jobs could be extracted or if some jobs could not be found.

The Log-files and Job definition flat files will be written to the following directories:

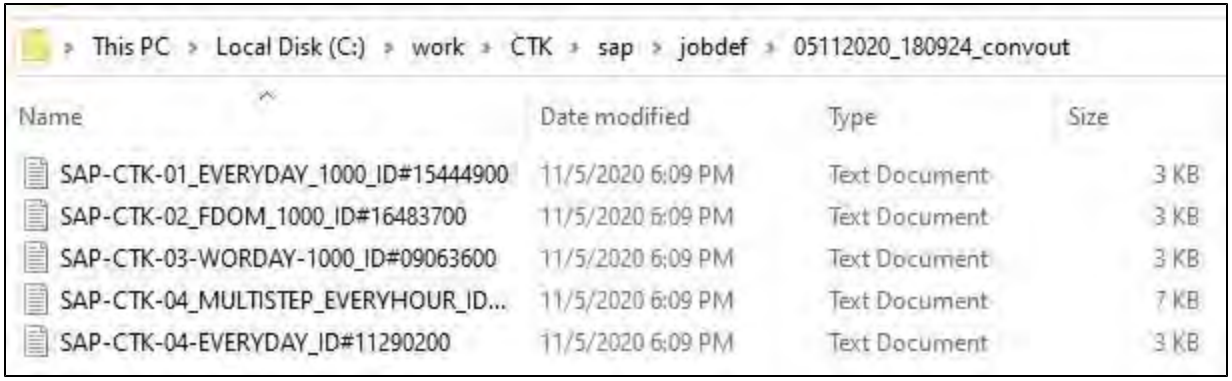
- <Working Directory>jobdef<DDMMYYY_HHMMSS_convout>
- <Working Directory>log

<Working Directory>: is the directory set in the Task Field: Working Directory e.g. *C:\work\CTK\sap*

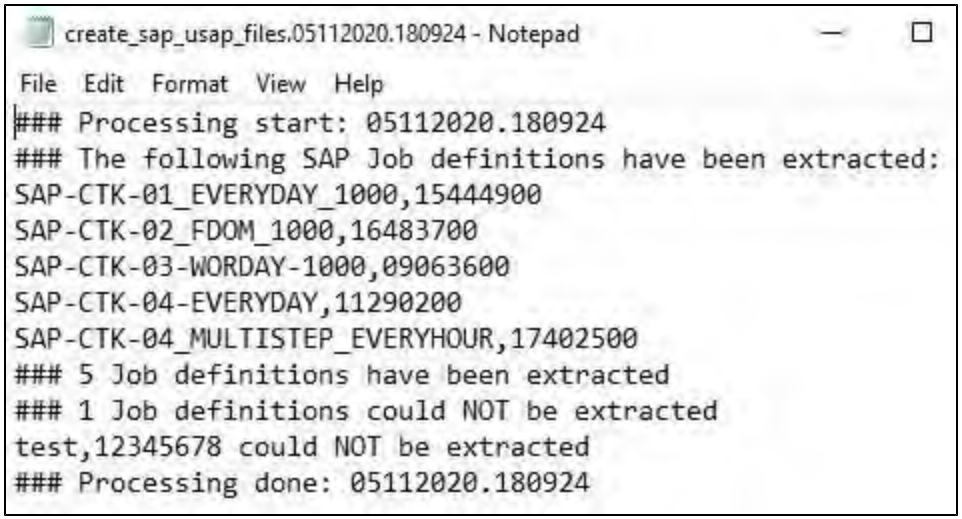
Example Output:

Working Directory = *C:\work\CTK\sap*

Extracted Job Definitions



Log-file Example



ServiceNow Integration

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- Configure ServiceNow Universal Task
- Field Descriptions for ServiceNow Universal Task
- Examples for ServiceNow Universal Tasks
  - Create ServiceNow Incident Ticket - Attach Output from Sibling Task
  - Create ServiceNow Incident Ticket - Attach Output from Task Instance
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  - Create Change Request
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Introduction

This Universal Task allows customers to create incident tickets, problem tickets, and change requests in ServiceNow straight from the Universal Controller. It can then be combined with the event- or time-based automation capabilities of the Controller to, for example., automatically create an incident ticket in case a task execution fails.

Creating or modifying other objects in ServiceNow can easily be achieved by adding respective fields to the Universal Template and extending the script.

Overview

- This task enables customers to create an incident ticket in ServiceNow and optionally attach the output of predecessor tasks to the ticket.

- It can create problem tickets in ServiceNow.
- It can create change requests in ServiceNow.
- This task combines with the event- or time-based automation capabilities of the Controller to automate the IT service management process.

Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against a remote ServiceNow instance.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests

Software Requirements for Universal Agent

- Universal Agent for Windows x64 Version 6.9.0.0 and later with python options installed, or
- Universal Agent for Linux Version 6.9.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.9.0.0 and later

Software Requirements for the Application to be Scheduled

This Universal Task has been tested with the following ServiceNow versions:

- Paris
- Orlando
- New York
- Madrid

ServiceNow Key Features

Feature	Description
Create an incident ticket	Create an incident ticket in your ServiceNow instance and assign it to certain users or groups in order to raise awareness of, for example, failed tasks in UAC. Optionally, attach the STDOUT and STDERR of a sibling task (task in the same workflow) or any task in UAC directly to the incident so that the assigned users can immediately start investigations on the error and act accordingly.
Create problem	Create a problem in ServiceNow to report on problems that could have arisen in your IT environment.
Create change request	Create a change request in ServiceNow to start the change management procedure depending on the configuration item. Note: Changes of UAC environments (e.g. promotion of a new workflow from DEV to PROD) can be enforced to follow your ServiceNow Change management procedure by automating the promotion of bundles (see Bundles & Promotion) from ServiceNow (for example, when the Change Request on the UAC configuration item moves to the “implement” phase) to UAC via the Web Service API. This requires some configuration in ServiceNow via Flows or Workflows.

Import ServiceNow Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure ServiceNow Universal Task

For the new Universal Task type, create a new task and enter the task-specific details that were created in the Universal Template.

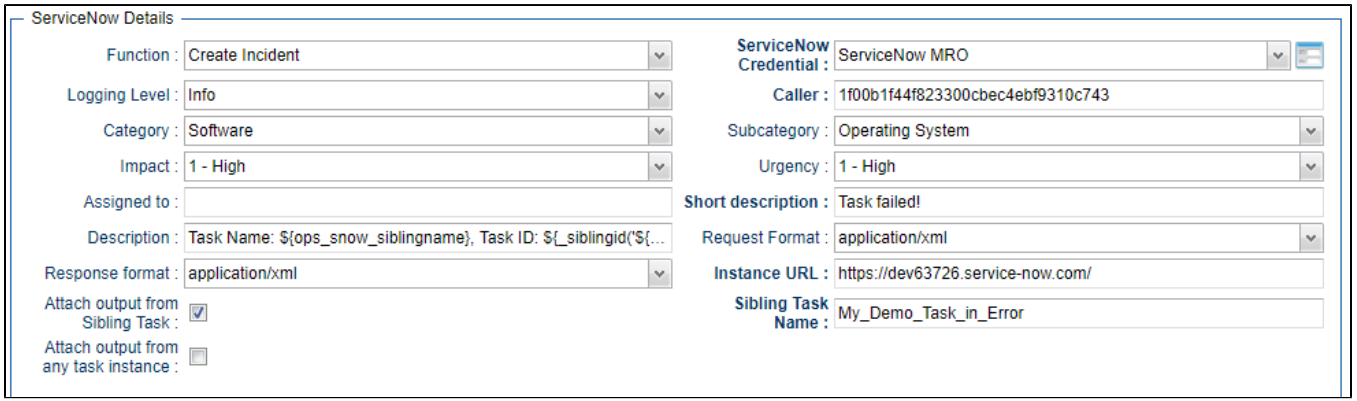
Field Descriptions for ServiceNow Universal Task

Field	Description
Function	Select ServiceNow function to be used (Create Incident, Create Problem, Create Change).
ServiceNow Credential	Credential object, save Username/Password for accessing ServiceNow via API.
Logging Level	Select level of logging for the task execution.
Caller	Person who reported or is affected by this incident (sys_id).
Category	Select pre-defined categories for incident creation.
Subcategory	Select pre-defined subcategories for incident creation.
Impact	Select impact of incident (high, medium, low).
Urgency	Select urgency of incident (high, medium, low).
Assigned to	Person primarily responsible for working this task in ServiceNow (sys_id).
Short Description	Short description of the incident, Universal Controller Variables can be used.
Description	Description of the Incident Ticket, Universal Controller Variables can be used.
Request Format	Select request format of API call (json, xml, text).
Response Format	Select response format of API call (json, xml, text).
Instance URL	URL of the ServiceNow instance; for example, https://dev53724.service-now.com.
Attach output from Sibling Task	Check if output from a sibling task (task within the same workflow) should be attached to the incident ticket.
Sibling Task Name	Name of the sibling task to which the output will be attached.

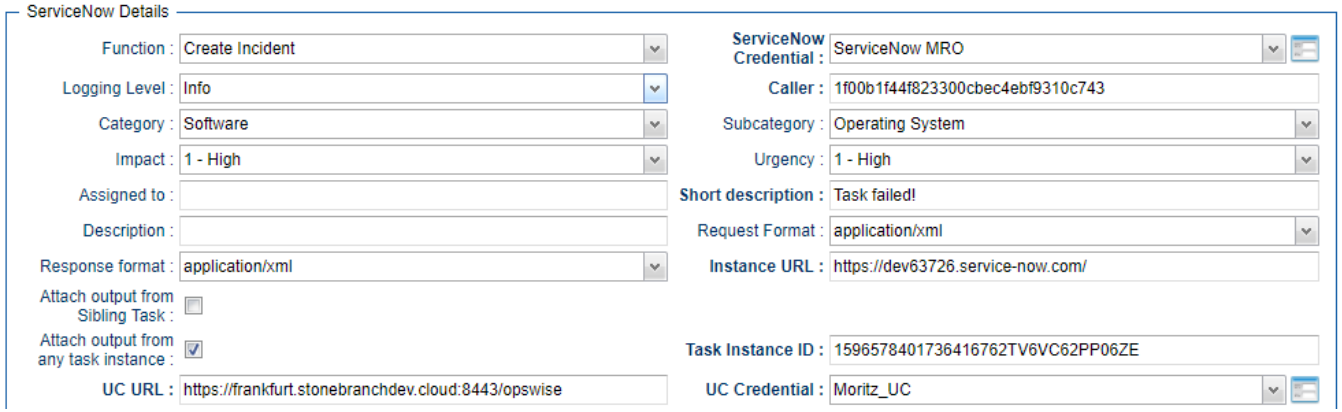
Attach output from any task instance	Check if output from any task instance available from any Controller should be attached to the incident ticket. Uses the REST API.
Task Instance ID	UUID of the task instance of which the output shall be attached (can be a variable).
UC URL	URL of the target Universal Controller; for example, https://frankfurt.stonebranchdev.cloud:8443/uc or http://localhost:8080/uc.
UC Credential	Credential for accessing the Controller. Must have API access on the target system.

Examples for ServiceNow Universal Tasks

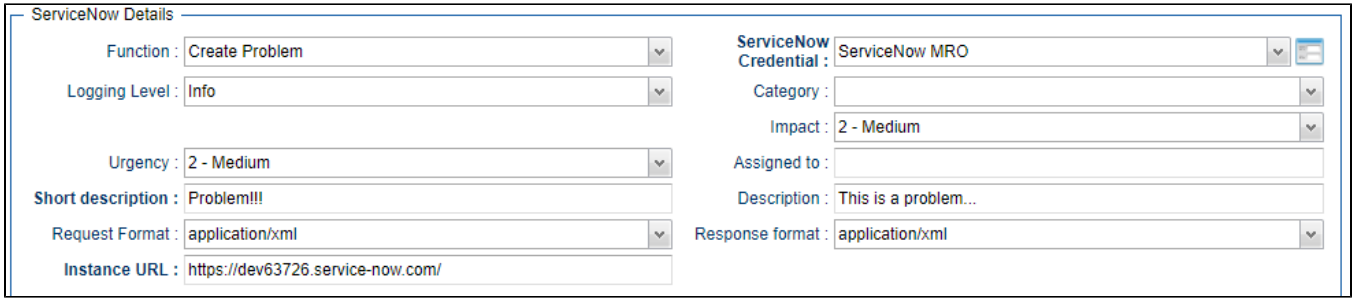
Create ServiceNow Incident Ticket - Attach Output from Sibling Task



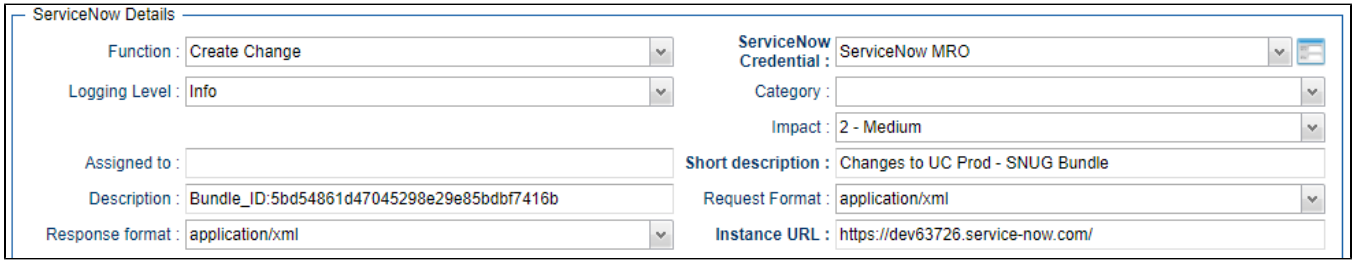
Create ServiceNow Incident Ticket - Attach Output from Task Instance



Create Problem Ticket



Create Change Request



Document References

This document references the following documents:

Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

Slack Notifications

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- Slack Notification Key Features
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- Configure Slack Notification Universal Task
- Field Descriptions for Slack Notification Universal Task
- Examples for Slack Notification Universal Tasks
    - Send a Job Status Notification to slack
    - Calling a slack Job Status Notification through Action -->System Operations and Launch Task
    - Send a Approval Notification to slack
        - Approval Message in Slack
- Document References

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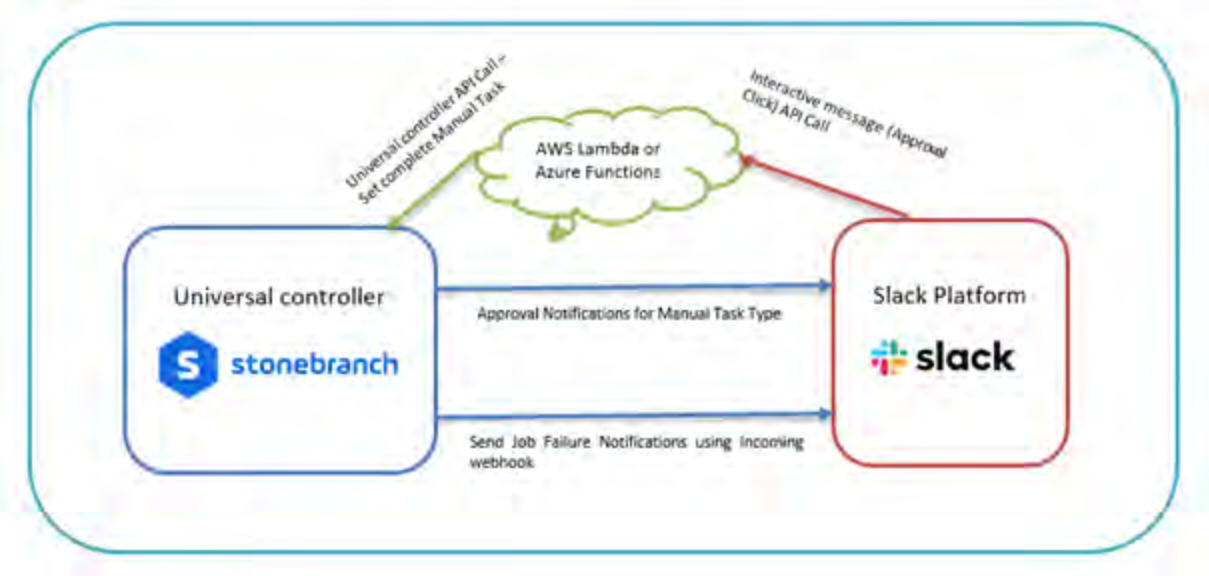
Introduction

This Universal Task sends job status notifications to a Slack channel. It also enables users to send interactive messages in Slack for Universal Controller manual task approvals.

Overview

- Notifies users of job failure, late start/run, and other important events via a Slack channel.
- Approval in Slack for Manual task type – users simply click on an approval button in Slack message to run manual tasks to success in Universal Controller, triggering continuation of workflow execution.

- Quick reaction time on job failures.
- Manual task interruptions in workflows can be handled by concerned applications/business team, while workflows in Universal Controller can be resumed simply by responding to the approval message in Slack.



Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against a Slack account with Incoming webbook enabled for a job notification. Also, in order to cater the approval functionality from slack for an manual task type in Universal Controller, you will need to have an Interactivity enabled in slack with the request URL which will be used to send the http POST request for interactive messages by slack.

Software Requirements for Universal Template and Universal Task

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against .

- Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 6.6.0.0 and later with python options installed
- Universal Agent for Linux Version 6.6.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.6.0.0 and later

Software Requirements for the Application to be Scheduled

The task can be used against any of your slack account or workspace that is of either free or standard or plus or enterprise grid

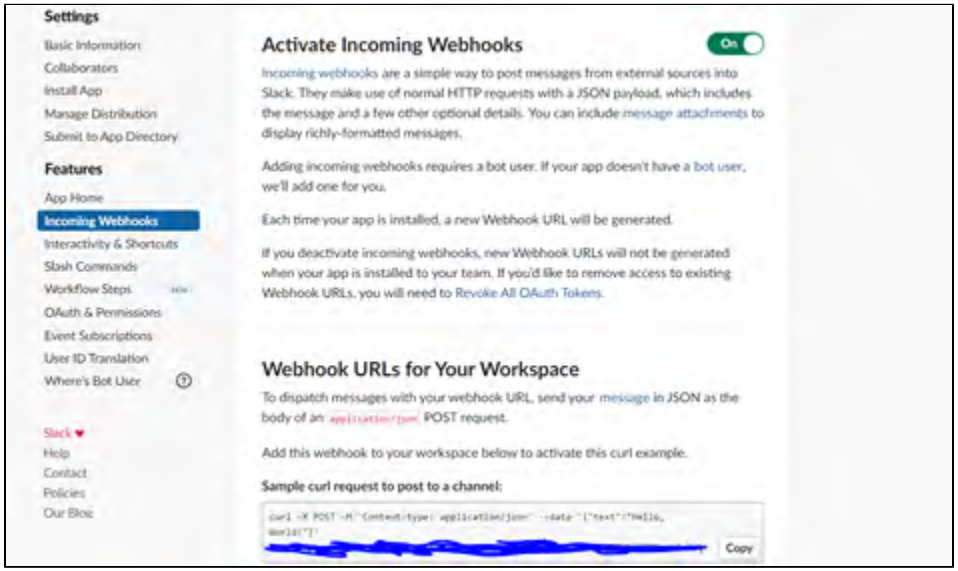
Technical Considerations

The request URL provided in Slack could be an end point either in AWS lambda or Azure Function, GCP function, or your custom API end point to handle the interactive message from slack and advise universal controller on approval or rejection of the manual task.

Below is the sample python code that could be invoked for the slack interactive message handling

Steps to Activate Incoming Webbooks:

- Go to your Browser and provide the URL: https://api.slack.com/apps/.
- Select or create an application that would be appropriate for sending Universal Controller notifications.
- Click on Incoming webhooks on the left menu and activate Incoming webhooks as below.



The URL generated here will be used in the Universal Task for posting message to slack platform

Slack Notification Key Features

Feature	Description
Job Notification	This feature can be used to send any job notification to a slack channel; for example, a job failure, Job long running, or Job held.
Approval Notification	Typically, Manual task types in universal controller are used, when there is a user manual intervention needed in a workflow task type and the Manual Task is completed successfully in universal controller by clicking on to the manual task command “Set Completed” traditionally . Now this task for slack can notify slack channel when the manual task reaches status: “Action Required” and User in slack can simply click on the approve/Reject Button in the slack interactive message that was sent by universal controller and then the manual task in the workflow can either go to success if approved or wait in the same status if rejected

Import Slack Notification Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Slack Notification Universal Task

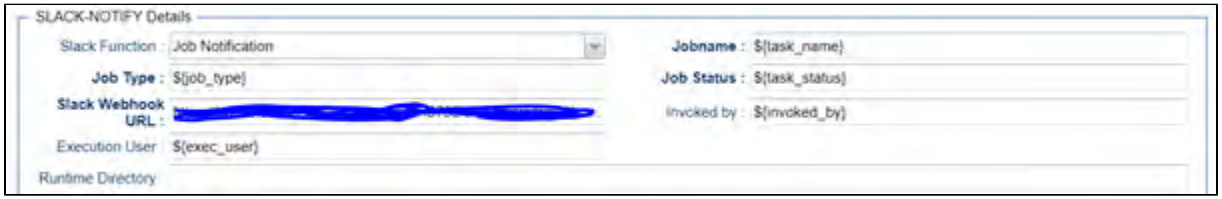
For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

Field Descriptions for Slack Notification Universal Task

Field	Description
Slack Function	Approval Notification (ideal to associate with manual tasks)
Job Name	Name of the job :${ops_task_name}
Job Status	Status of the job:${ops_status}
Slack Incoming Webhook	Incoming webhook URL for your slack account
Execution User	Execution User of the Manual Task:${ops_execution_user}
Job type	Task type of task instance: ${ops_task_type}

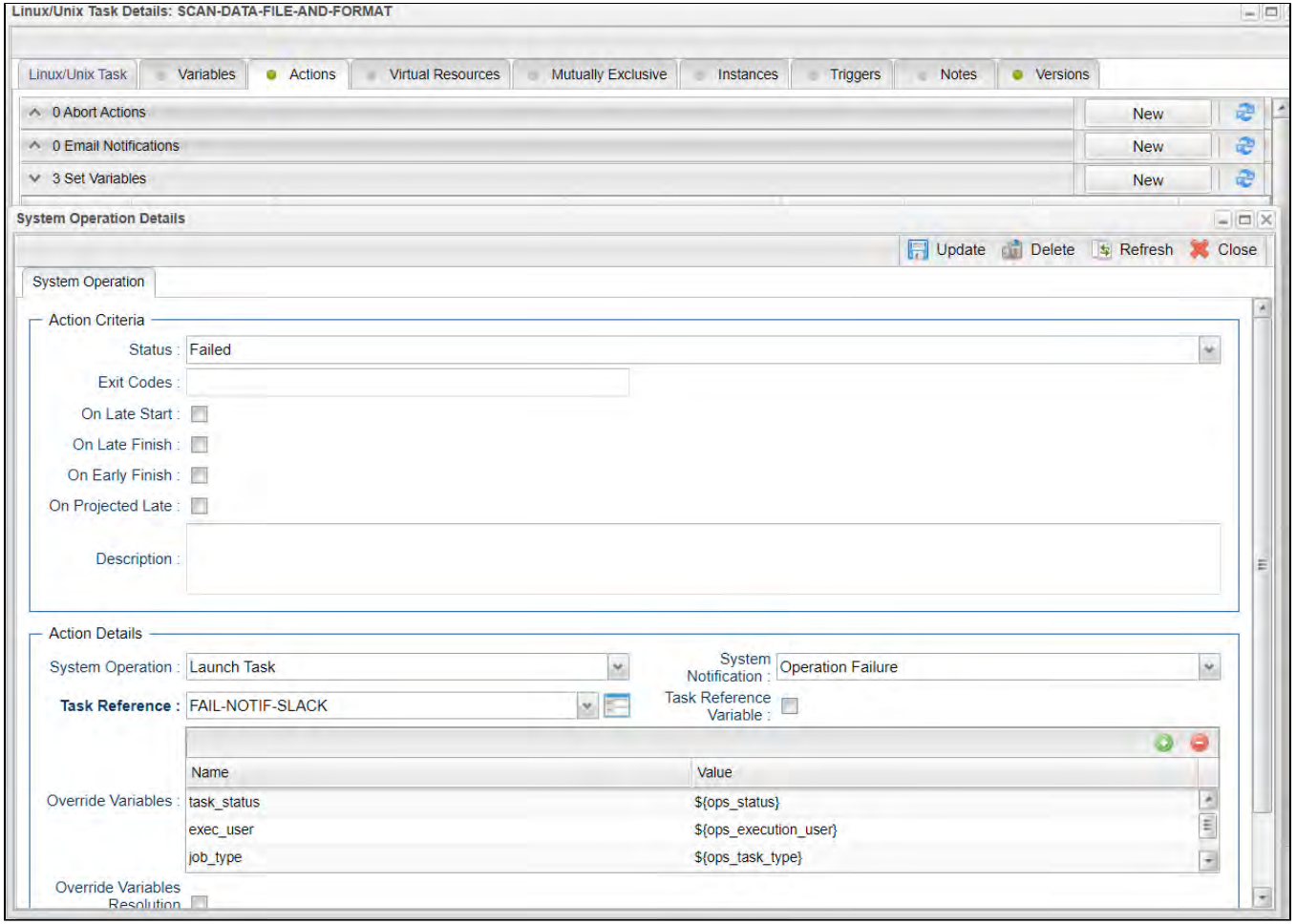
Examples for Slack Notification Universal Tasks

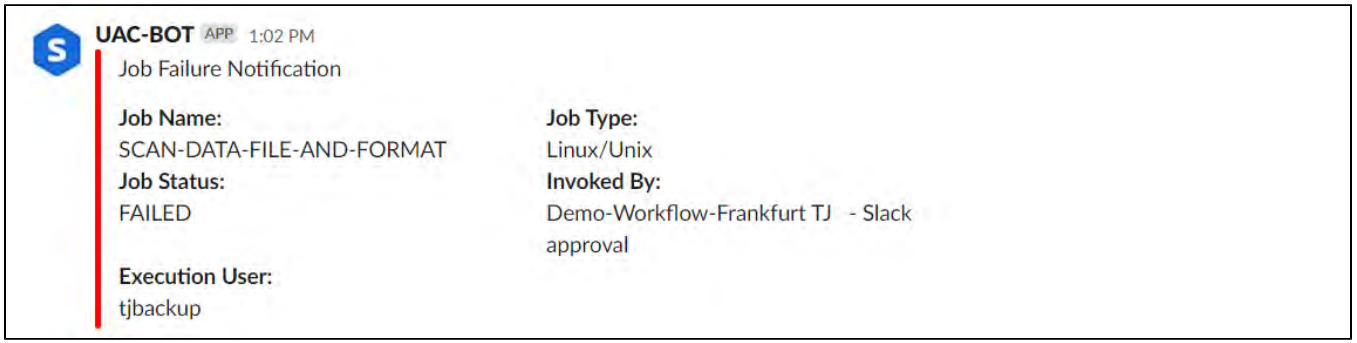
Send a Job Status Notification to slack



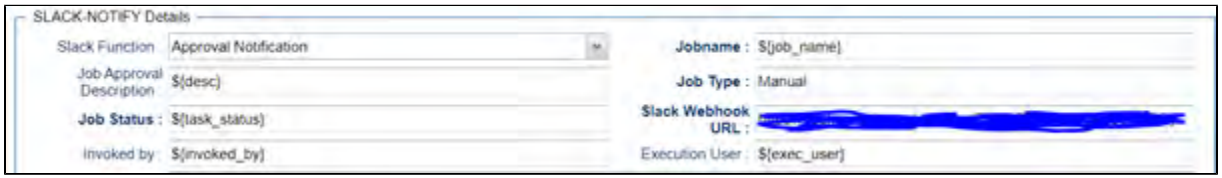
Calling a slack Job Status Notification through Action -->System Operations and Launch Task

(Also this could be made generic for a group of jobs or all jobs by calling the slack notification job from Task monitor job.)

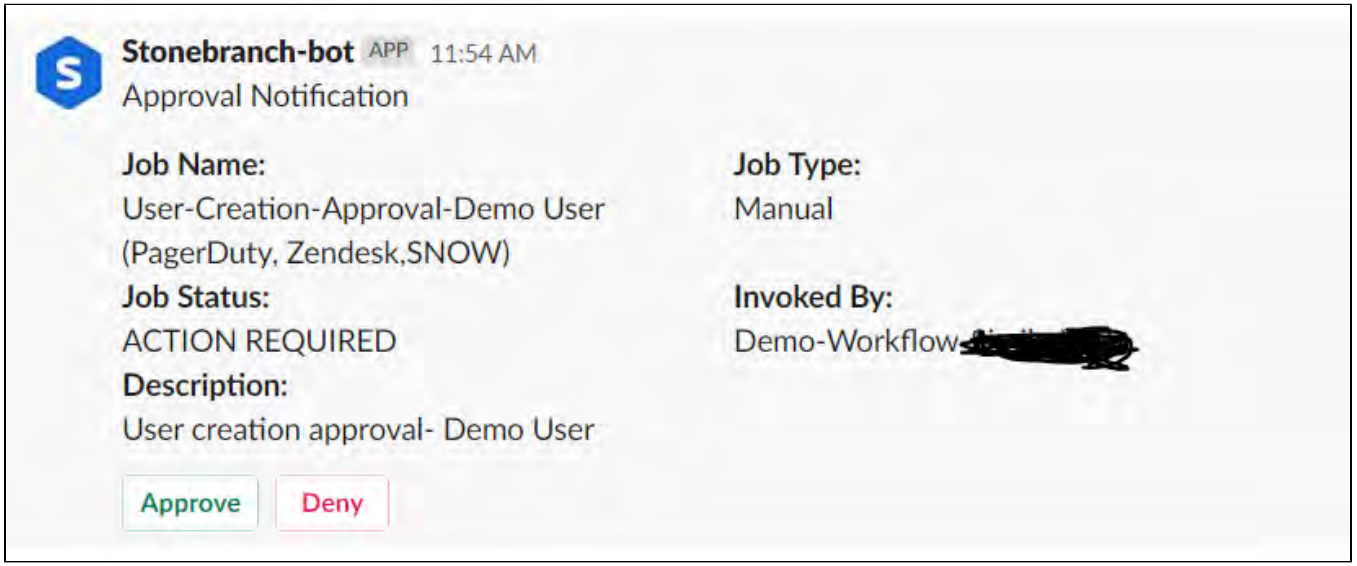

Linux/Unix Task Details: SCAN-DATA-FILE-AND-FORMAT
Linux/Unix Task
Variables
Actions
Virtual Resources
Mutually Exclusive
Instances
Triggers
Notes
Versions
0 Abort Actions
New
0 Email Notifications
New
3 Set Variables
New
System Operation Details
Update
Delete
Refresh
Close
System Operation
Action Criteria
Status : Failed
Exit Codes :
On Late Start :
On Late Finish :
On Early Finish :
On Projected Late :
Description :
Action Details
System Operation : Launch Task
System Notification : Operation Failure
Task Reference : FAIL-NOTIF-SLACK
Task Reference Variable :
Name
Value
Override Variables :
task_status
${ops_status}
exec_user
${ops_execution_user}
job_type
${ops_task_type}
Override Variables Resolution


UAC-BOT APP 1:02 PM
Job Failure Notification
Job Name:
SCAN-DATA-FILE-AND-FORMAT
Job Type:
Linux/Unix
Job Status:
FAILED
Invoked By:
Demo-Workflow-Frankfurt TJ - Slack approval
Execution User:
tjbackup

Send a Approval Notification to slack



Approval Message in Slack



Document References

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Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

Snowflake

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- Configure Snowflake Integration Universal Task
- Field Descriptions for Snowflake Integration Universal Task
- Examples for Snowflake Integration Universal Tasks
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  - Load Data from AWS S3 to Snowflake Table
  - Load Data from Google Cloud Storage to Snowflake Table
  - Copy Local File to Snowflake Staging
  - Load Snowflake Staging File to Table
  - Unload Snowflake Table to AWS S3 Storage
  - Unload Snowflake Table to Azure Storage
  - Download Snowflake Stage File to Local Linux Server
  - Copy Multiple Files (Linux Server) to Snowflake Staging Area
  - Executing a Snowflake Command
  - Snowflake Universal Task Functions
- Document References

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Introduction

This Universal Task allows Stonebranch users to orchestrate, schedule, trigger, and monitor the Snowflake load and unload process from different data sources (cloud storage or local VM’s) directly from Universal Controller. It uses Python libraries to perform all functions listed in the following sections. Alternatively, you also can perform all these operations using the snowflake JDBC driver which you can add to the Universal Controller libraries, and use SQL Task to perform any operations with Snowflake (https://docs.snowflake.com/en/user-guide/jdbc-download.html)

Overview

Users can orchestrate the Snowflake functionalities using the following features available in the Universal Task

- UAC functionalities (Snowflake -Loading)
    - Load data from AWS S3 to Snowflake.
    - Load data from Azure Storage to Snowflake.
    - Load data from Google storage to Snowflake.
    - Load Internal stage file to Snowflake Table.
    - Copy from local server to Internal staging.
- UAC functionalities (Snowflake - Unloading)
    - Unload Snowflake data to AWS S3.
    - Unload Snowflake data to Azure Storage.
    - Unload Snowflake data to Google Storage.
    - Unload Snowflake data to Internal stage.
    - Unload from internal stage to local server.
- UAC functionalities (Snowflake – Execute Commands)
    - Execute a Snowflake command.

Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against Snowflake.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - https://raw.githubusercontent.com/snowflakedb/snowflake-connector-python/v2.3.9/tested_requirements/requirements_36.reqs
    - snowflake-connector-python
    - snowflake-ingest
    - Please refer to Snowflake URL : https://docs.snowflake.com/en/user-guide/python-connector-install.html for the latest Python connector details.

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 6.6 and later with Python options installed.
- Universal Agent for Linux Version 6.6 and later with Python options installed.

Software Requirements for Universal Controller

- Universal Controller Version 6..6.0.0 and later.

Software Requirements for the Application to be Scheduled

This Universal Task has been tested with the snowflake-connector-python=2.3.9 and snowflake-ingest=1.0.3.

Technical Considerations

- This task uses Python modules snowflake-connector-python and snowflake-ingest to make REST-API calls to Snowflake, Additionally, as a prerequisite, users might need to install other packages listed in https://raw.githubusercontent.com/snowflakedb/snowflake-connector-python/v2.3.9/tested_requirements/requirements_36.reqs.
- Snowflake login credential, Snowflake Account name, and URL would be needed in UAC for this Universal Task.
- In the case of data ingest from internal staging to Snowflake table through a pipeline, you would need to supply a private key file from local server and public key for the same to be loaded against the Snowflake user used in Universal Task.
- Use the Snowflake instructions is in URL : https://docs.snowflake.com/en/user-guide/key-pair-auth.html for Key pair authentication and rotation process.

Key Features

Feature	Description
Load data from AWS S3 to Snowflake	Load the S3 bucket file(s) into a Snowflake table, You may specify the file format options and copy options appropriately.
Load data from Azure Storage to Snowflake	Load the Azure container blobs into a Snowflake table, You may specify the file format options and copy options appropriately.
Load data from Google storage to Snowflake	Load the google storage bucket files into a Snowflake table, You may specify the file format options and copy options appropriately. Please note that you will need to define the storage integration in Snowflake and provide this in the Universal Task.
Load Internal stage file to Snowflake Table	Files that are available in Snowflake internal storage to be loaded into a Snowflake table using the pipe name and authentication using private public key files. The data can be loaded in Snowflake using patterns.
Copy from local server to Internal staging	Copies files from local Windows or Linux server to Snowflake internal staging area.
Unload Snowflake data to AWS S3	This feature helps to unload the data from a Snowflake table to a AWS S3 bucket, file format options and copy options can be provided appropriately.
Unload Snowflake data to Azure Storage	This feature helps to unload the data from a Snowflake table to an Azure container; file format options and copy options can be provided appropriately.
Unload Snowflake data to Google Storage	This feature helps to unload the data from a Snowflake table to a Google cloud Storage; file format options and copy options can be provided appropriately. Also, this would need an storage integration name from Snowflake.
Unload Snowflake data to Internal stage	Unloads the Snowflake table into an internal staging area in Snowflake.
Unload from internal stage to local server	This feature helps to copy the files in staging area to a local windows or a Linux server.
Execute a Snowflake command	Users can use this feature to execute snowflake commands; for example: Copy, Remove, Select, Delete, etc.

Import Snowflake Integration Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure Snowflake Integration Universal Task

For the new Universal Task type, create a new task, and enter the task-specific details that were created in the Universal Template.

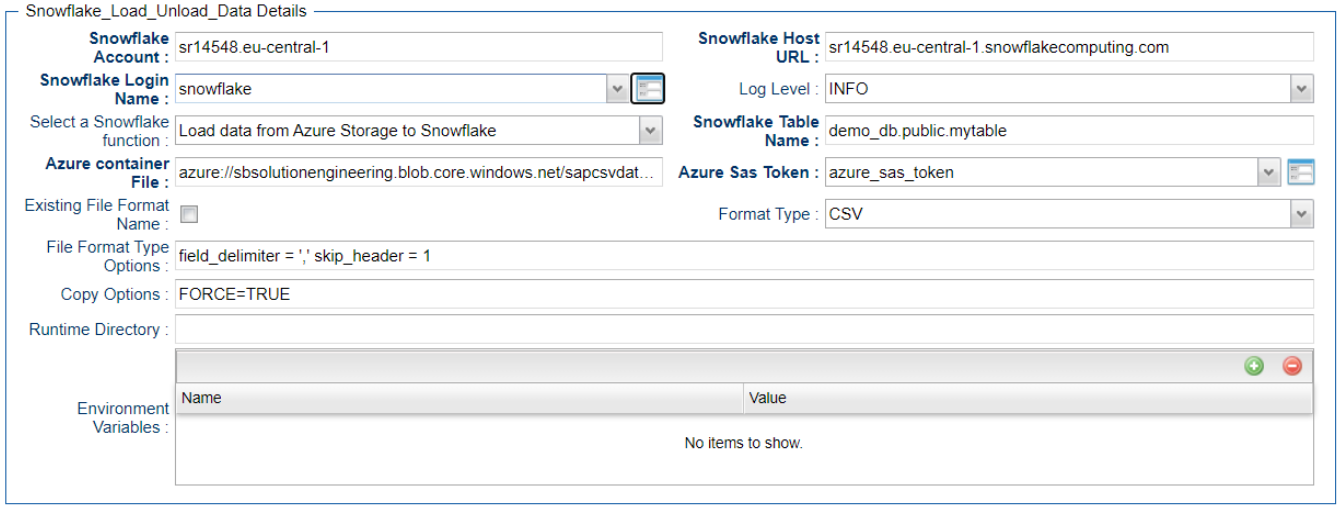
Field Descriptions for Snowflake Integration Universal Task

Field	Description
Snowflake Account	Provide the Snowflake user account; for example, sr14548.eu-central-1.
Snowflake Host URL	Specify your host information in the form of a URL; for example, sr14548.eu-central-1.snowflakecomputing.com.
Snowflake Login Name	Specify your Snowflake login name..
Log Level	Select a log level.
Select a Snowflake function	Select the required Snowflake function (if the required function not available, check the SQL task to invoke snowflake DB).
Snowflake Command	Provide a Snowflake command either in SQL or put / get commands etc.
Local file Name & Path	Provide the local file name that need to be copied to stage.
Stage Name	Provide the stage(internal) name in Snowflake.
Encrypted Private Key	Select only if you have a encrypted private key.
Stage File Name(s)	Provide the stage file names; if there are multiple files, separate by comma.
Pipe Name	Specify the fully-qualified name of the pipe to use to load the data.
Private Key File Path	Provide the private key file path to establish connection to Snowflake for data ingest.
Private Key Password	Provide the password for private if it is encrypted.
Snowflake Table Name	Provide the full path and the Snowflake table name where the table to be loaded.
Use AWS Credentials	Check this if you need to supply AWS access key credentials.
AWS Key ID & Secret Access Key	Provide the AWS secret Access Key (runtime user AWS Key id and secret key in the password section).
AWS Storage Integration	Provide the name of the AWS storage integration created in Snowflake.

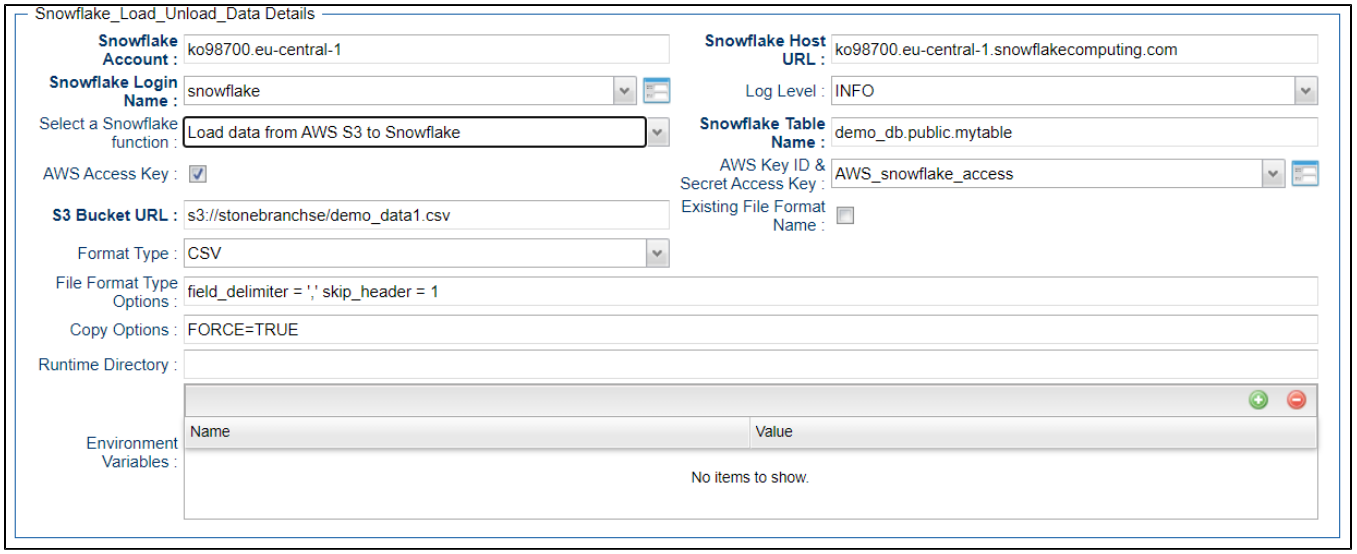
Load using Pattern	If you need load the data using pattern, check this option.
S3 Bucket URL	Provide your S3 bucket URL s3://<your_s3_bucket>/data/.
Azure container File	Provide the Azure container file URL starting with azure://
Azure Storage Integration	Provide the Azure storage integration created in Snowflake.
GCP storage URL	Provide the bucket name and the file name; for example, gcs://mybucket/data/files.
Azure Sas Token	Provide the Azure Sas Token.
Existing File Format Name	Specify an existing named file format to use for loading data into the table.
Storage Integration	Provide the Snowflake storage integration details.
Pattern	Regular expression pattern string - specifying the file names and/or paths to match.
File Format Name	Specifies an existing named file format to use for loading data into the table.
Format Type	Specify the format type: CSV | JSON | AVRO | ORC | PARQUET | XML.
File Format Type Options	Specify the file format type options; for example, FIELD_DELIMITER = '|' if CSV type -- Refer to https://docs.snowflake.com/en/sql-reference/sql/copy-into-table.html
Copy Options	Include other copy options; for example, ON_ERROR = CONTINUE or FORCE=TRUE- Refer to https://docs.snowflake.com/en/sql-reference/sql/copy-into-table.html
Polling Interval (Secs)	Provide the Polling Interval time in Seconds, in the case of data ingestion from internal staging to Snowflake Table.
Number of times to Poll	Specify the number of times to poll; otherwise, default is set to 50, in the case of data ingestion from internal staging to Snowflake Table.

Examples for Snowflake Integration Universal Tasks

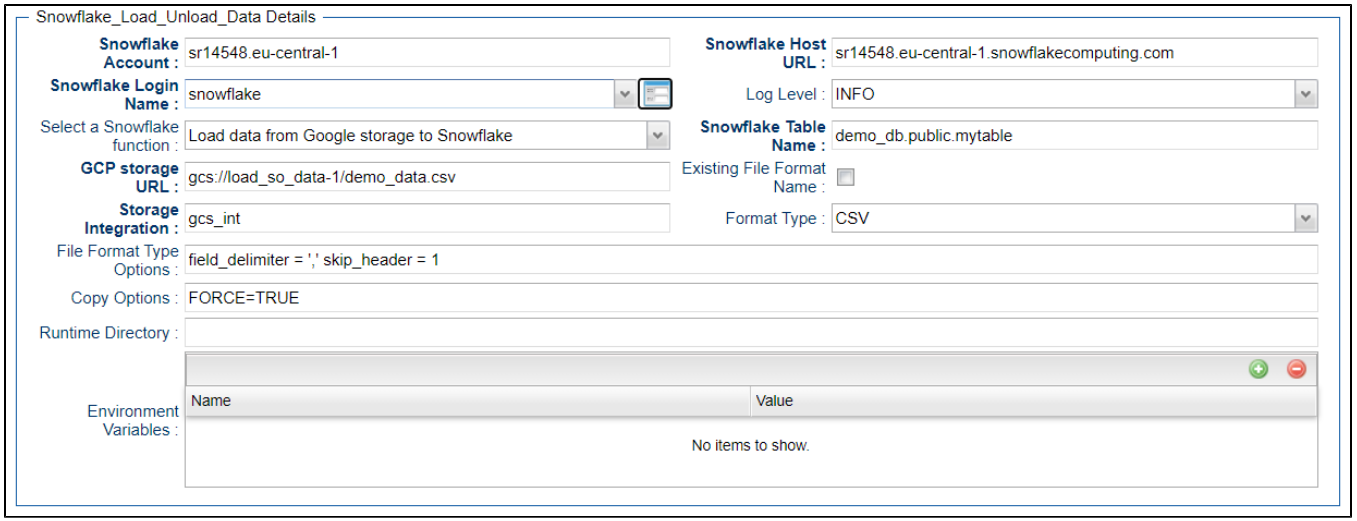
Load Data from Azure Storage to Snowflake Table



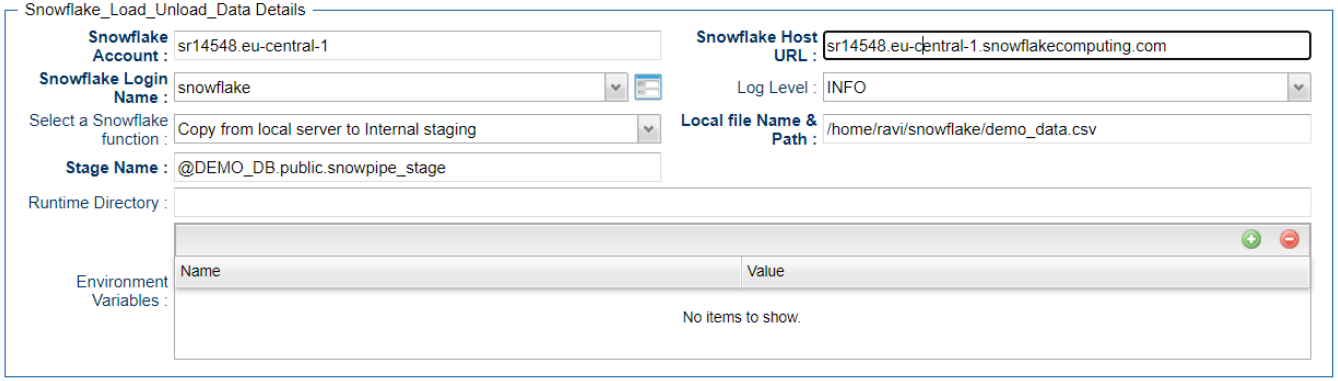
Load Data from AWS S3 to Snowflake Table



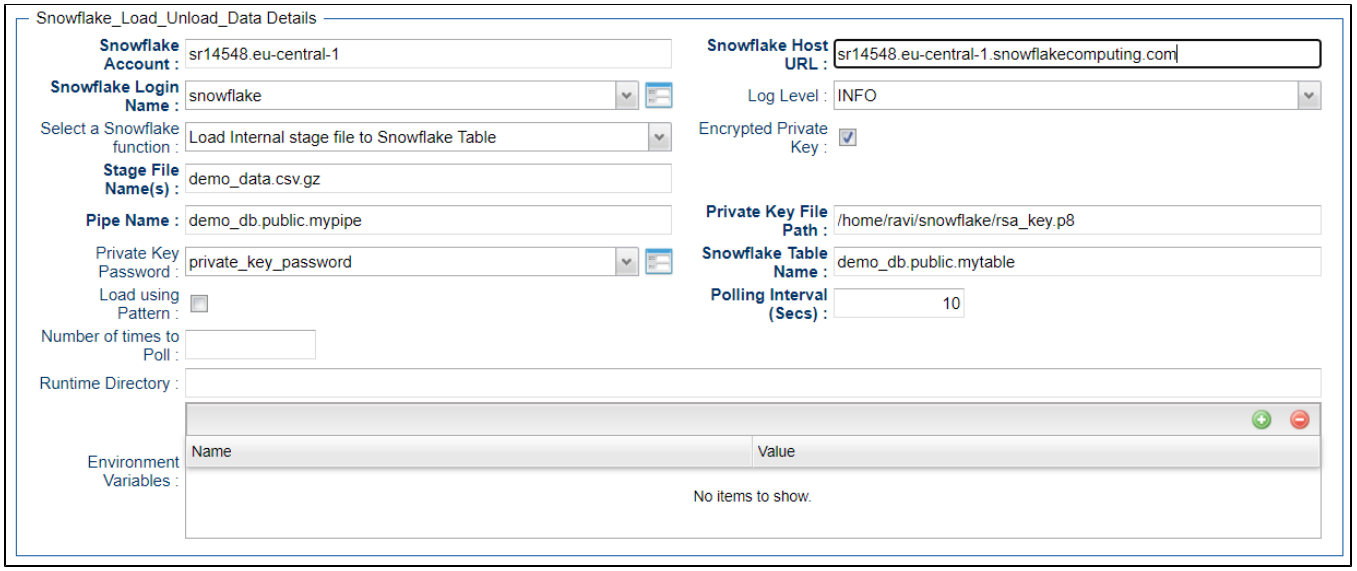
Load Data from Google Cloud Storage to Snowflake Table



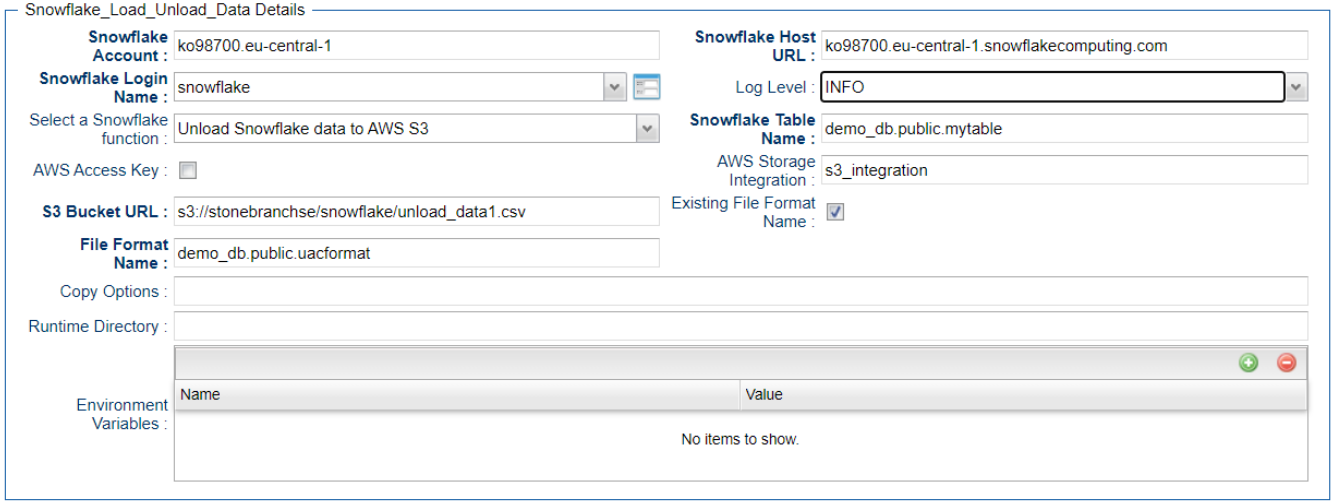
Copy Local File to Snowflake Staging



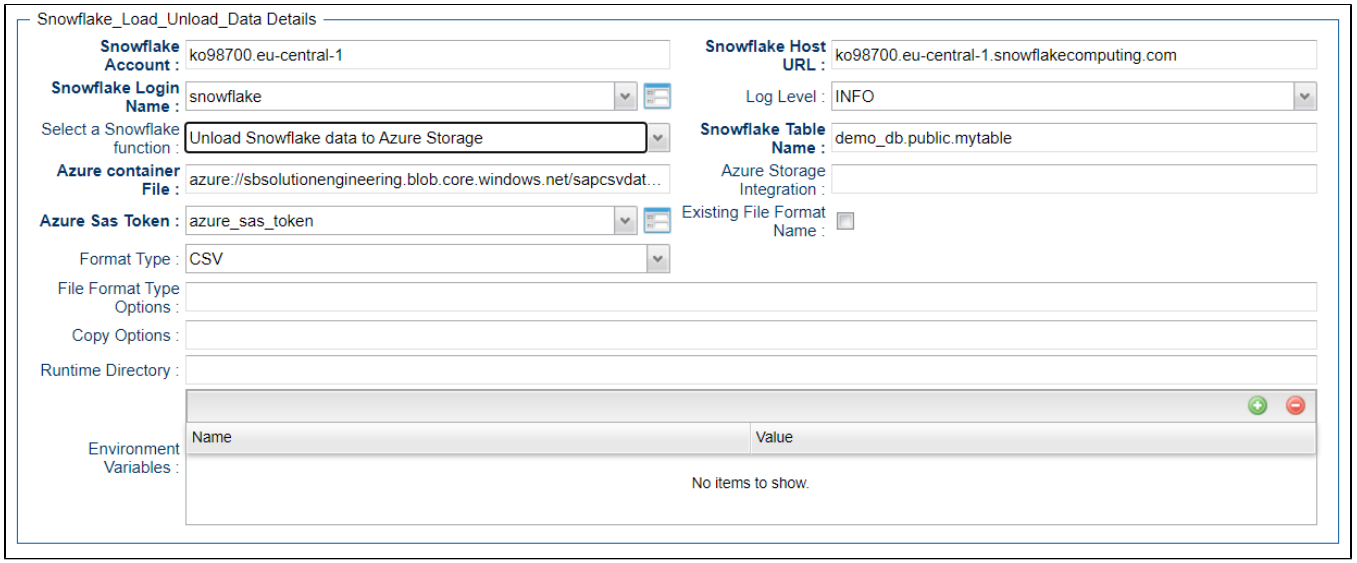
Load Snowflake Staging File to Table



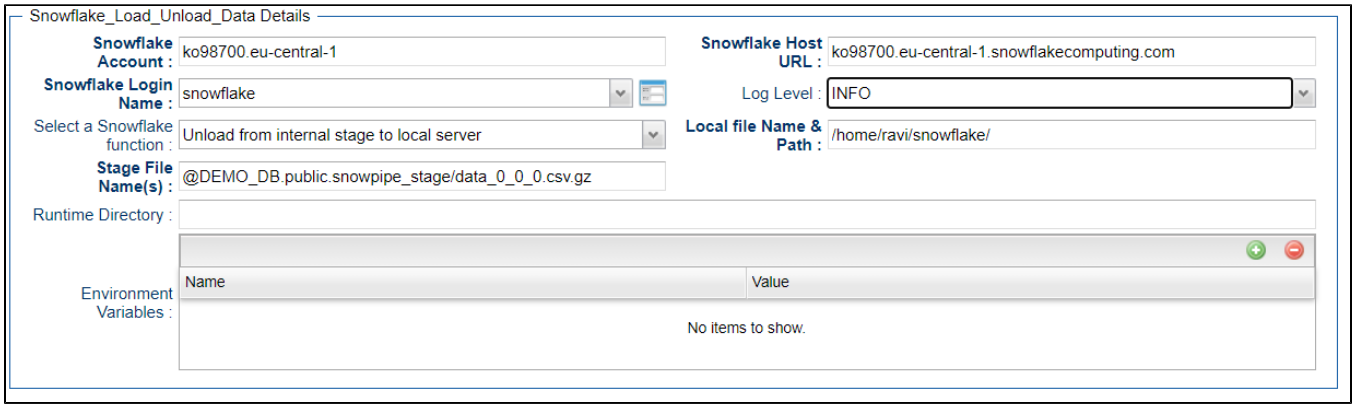
Unload Snowflake Table to AWS S3 Storage



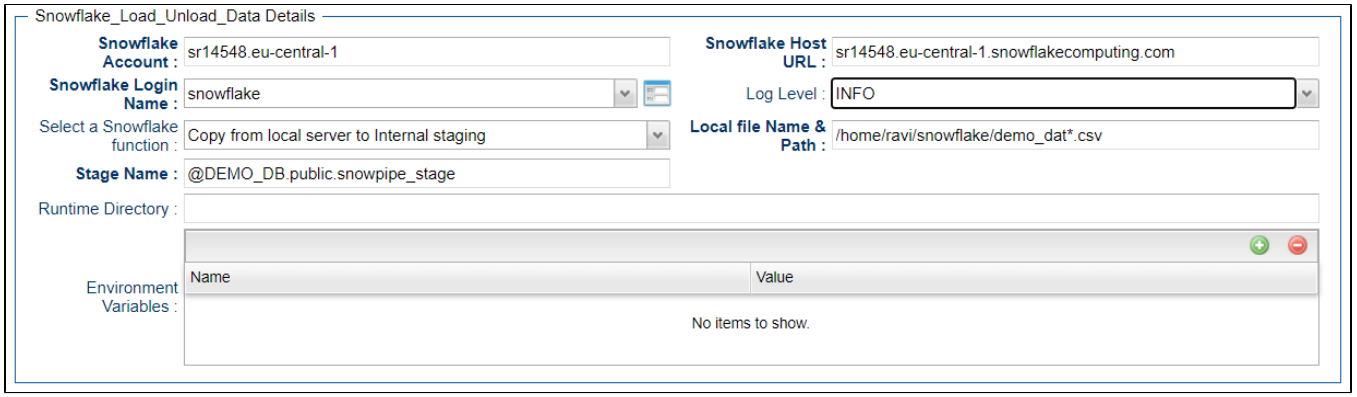
Unload Snowflake Table to Azure Storage



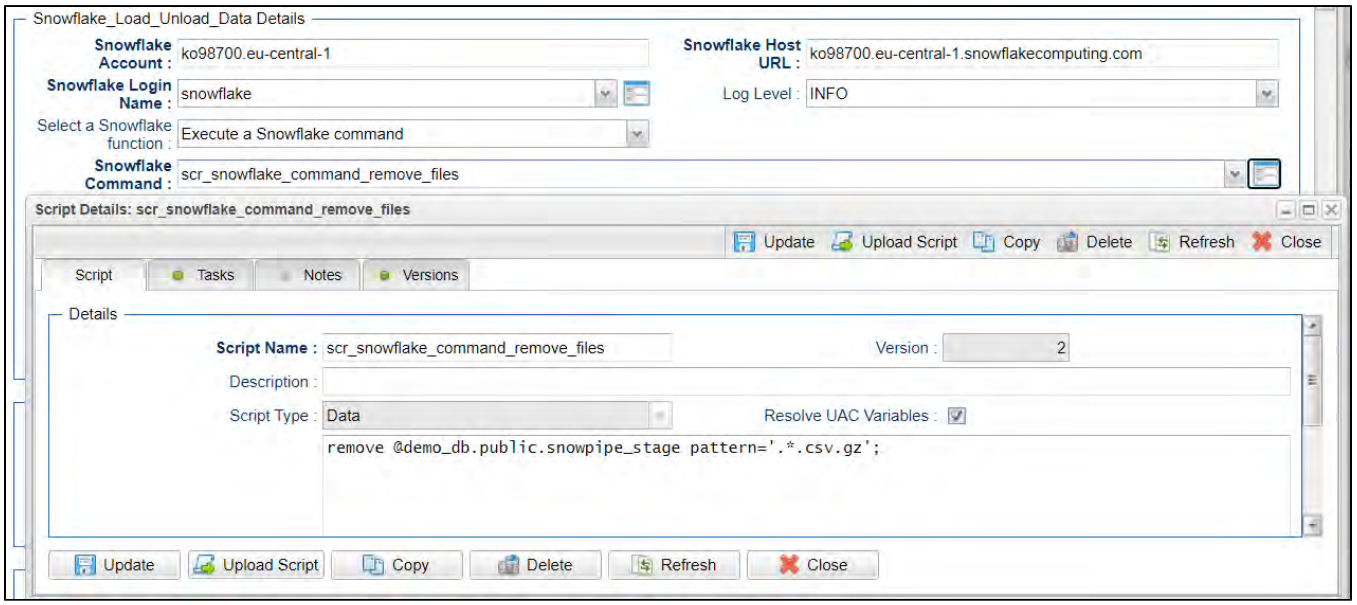
Download Snowflake Stage File to Local Linux Server



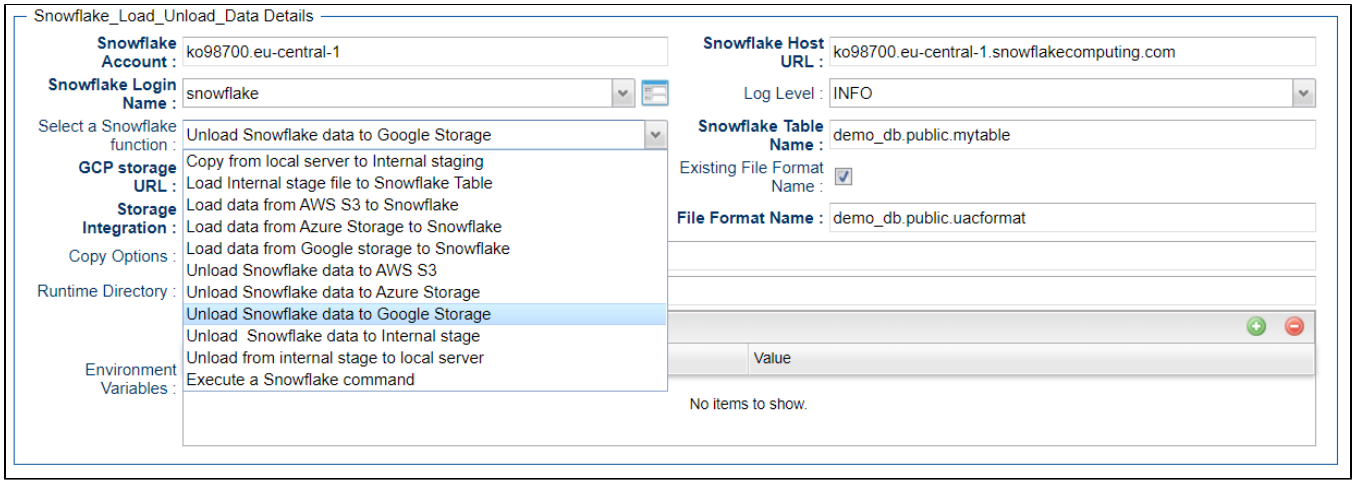
Copy Multiple Files (Linux Server) to Snowflake Staging Area



Executing a Snowflake Command



Snowflake Universal Task Functions



Document References

This document references the following documents:

Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.

SQL

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    - Example: Run a SQL Script on Oracle - SQL
  - Database Type: Oracle - PLSQL Block
    - Example: Run an Oracle - PLSQL Block
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  - Database Type: Microsoft SQL Server
    - Example: Run a SQL Script on Microsoft SQL Server
  - Database Type: SAP HANA
    - Example: Run a SQL Script on SAP HANA
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Disclaimer

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Introduction

This Universal Task allows users to execute SQL scripts and functions against a MySQL, PostgreSQL, Microsoft SQL Server, Oracle and SAP HANA database.

It uses an agentless connection via ODBC towards SQLSERVER, MySQL and PostgreSQL and the oracle basic instant client to connect to an Oracle database.

Software Requirements

Software Requirements for Universal Template and Universal Task

- Universal Agent for Linux or Windows Version 6.9.0.0 or later are required.
- Universal Agent needs to be installed with python option (--python yes).
- The python ODBC module pyodbc v4.0.30 needs to be installed for MySQL, PostgreSQL and Microsoft SQL Server connections.
- The python SAP HANA module hdbcli v2.6.58 needs to be installed for SAP HANA connections.
- The python Oracle module cx_oracle 8.0.1needs to be installed for Oracle Database connections.

Software Requirements Universal Controller

- Universal Controller 6.9.0.0. or later is required

Software Requirements for the Application to be Scheduled

The Universal Task has been tested for the following databases, Versions and Connector. Please make sure that the connector is installed for your database.

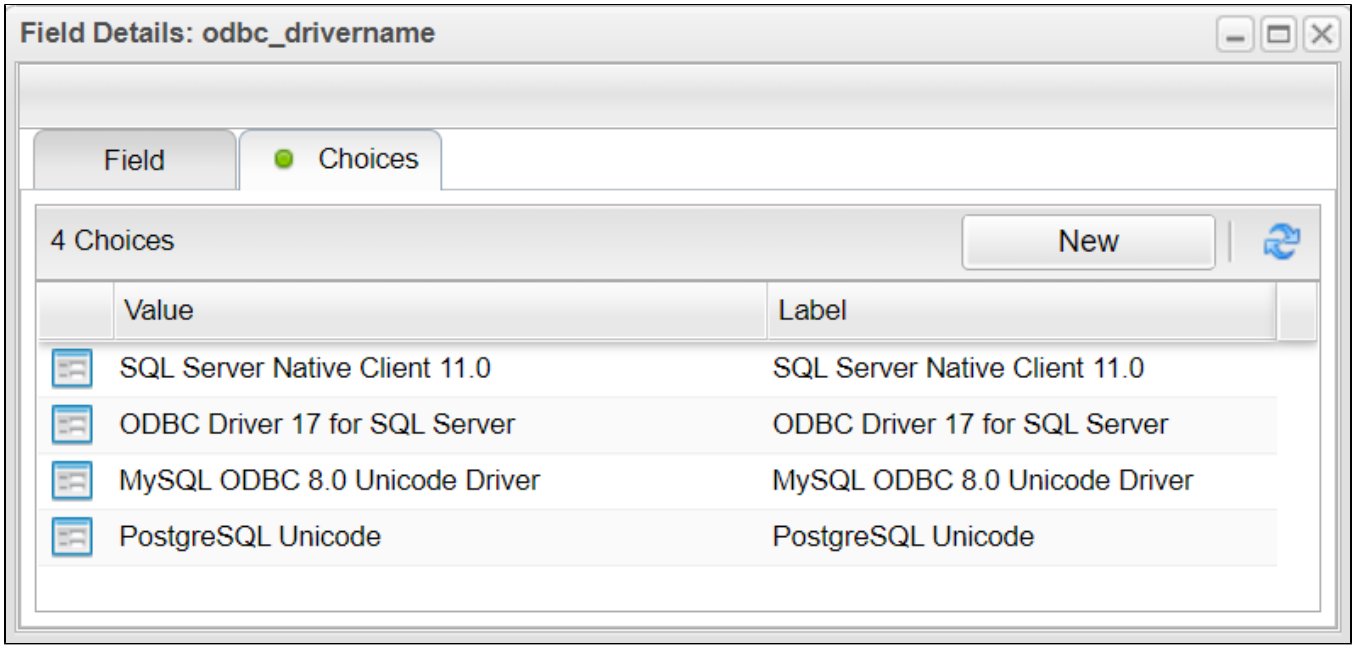
Name	Version	Database Connector
MySQL	8	*MySQL ODBC 8.0 Unicode Driver*
PostgreSQL	13	*PostgreSQL Unicode*
Microsoft SQL Server	15	either one of them: • *SQL Server Native Client 11.0,* • *ODBC Driver 17 for SQL Server*
Oracle	18XE	*Oracle Instant Client v19.6.0.0.0*
SAP HANA		not required - part of the SAP Python hdbcli module

Note

If you have a different Database Connector than mentioned in the table above. you can add a new connector to the Universal Task by adding it to the Universal Template of the Universal Task with name SQL.

In Universal Controller

Administration Universal Templates SQL Fields odbc_drivername New - button



SQL Universal Task Key Features

The solution supports the following file transfer scenarios:

- The Universal Task supports execution of SQL scripts for Oracle, MySQL, PostgreSQL, Microsoft SQL Server and SAP HANA.
- For Oracle the execution of SQL scripts and oracle PLSQL blocks are supported.
- All connections are agentless via ODBC for SQLSERVER, MySQL and PostgreSQL.
- Oracle connections are performed agentless using the oracle basic instant client.
- SAP Hana Database connections are performed agentless using the SAP HANA client for Python.
- The Universal Task supports both Universal Agent for Linux/Unix and Windows.
- You can select different log-levels e.g. Info and debug.
- You can decide whether or not the SQL-output is provided in the standard out.
- All Passwords are encrypted using Controller Credentials.
- For SQLSERVER *Windows Authentication* and *SQLSERVER Authentication* is supported.

Import SQL Universal Task Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.
5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure SQL Universal Tasks

For the new Universal Task type, create a new task and enter the task-specific Details that were created in the Universal Template.

Field Descriptions for SQL Universal Task

The following will provide a configuration Example for each of the supported Databases:

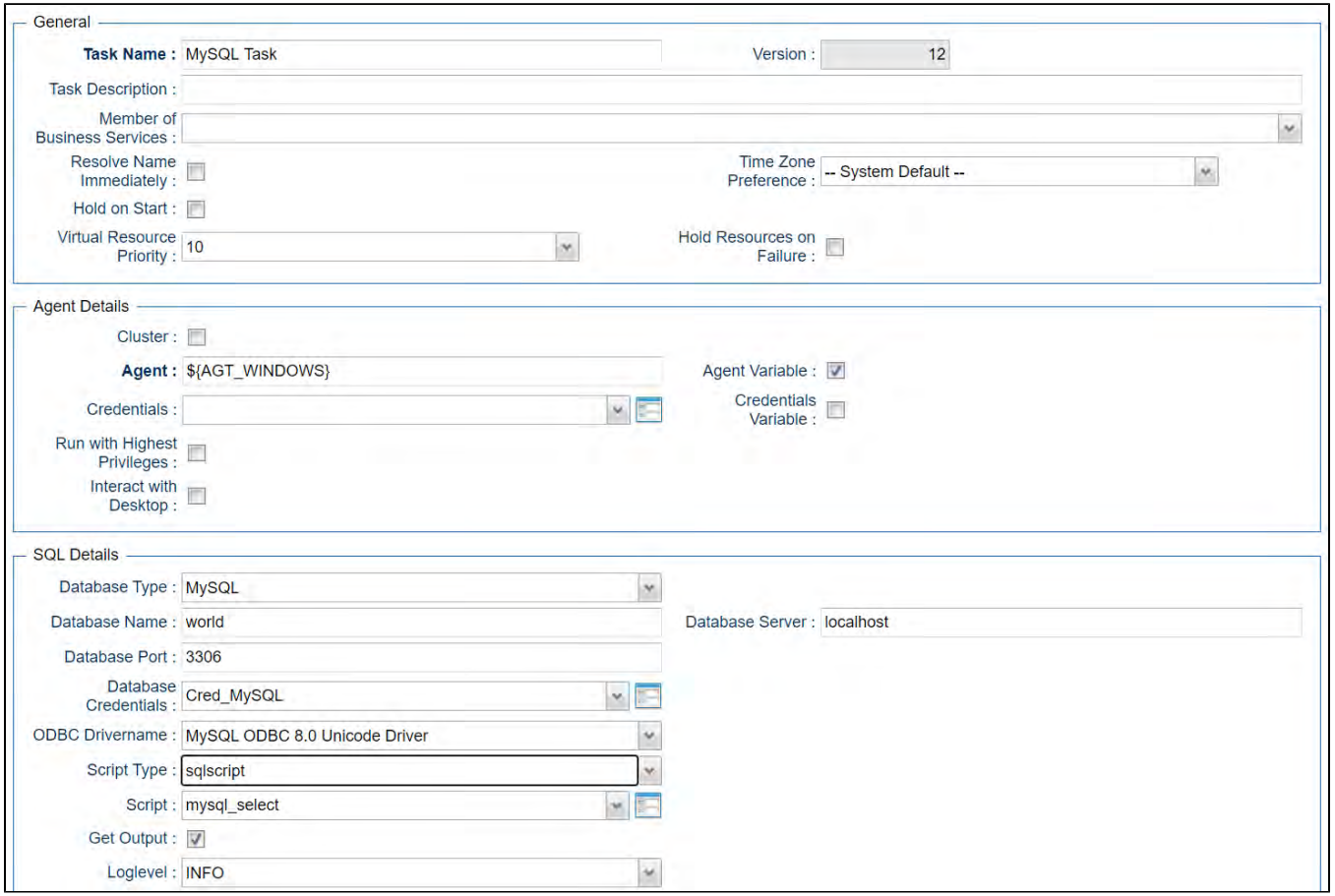
- Database Type: MySQL
- Database Type: Oracle - SQL
- Database Type: Oracle - PLSQL Block
- Database Type: PostgreSQL
- Database Type: Microsoft SQL Server
- Database Type: SAP HANA

Database Type: MySQL

Field	Description
Database Type	Type of database to connect: • **MySQL** • Oracle • PostgreSQL • Microsoft SQL Server • SAP HANA
Database Name	**Database name** or oracle service name
Database Server	Database Servername e.g. localhost
Database Port	Port of the Database e.g. • **MySQL: 3306** • Oracle: 1541 • PostgreSQL: 5432 • Microsoft SQL Server: 1433 • SAP HANA: 39013
Database Credentials	Database Connection Credentials
ODBC Drivername	Name of the ODBC driver - the field is only relevant for MySQL, PostgreSQL and Microsoft SQL Server. The following driver are available for selection: • ***MySQL: MySQL ODBC 8.0 Unicode Driver*** • *MS SQL Server: SQL Server Native Client 11.0,* • *MS SQL Server: ODBC Driver 17 for SQL Server*

	• *PostgreSQL: PostgreSQL Unicode* Additional driver can be added in the SQL Task Universal Template under: *Administration Universal Templates SQL Fields odbc_drivername New*
Script	The database script to execute Note: The name should not contain a Universal Controller Variable e.g. script name: *sb-${**ENV**}-proc01* will **not** work, because it contains a variable (${ENV}) in the name.
Get Output	*prints the SQL output to STDOUT* *In case of an Oracle Stored procedure print the dbms_output to STDOUT.*
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

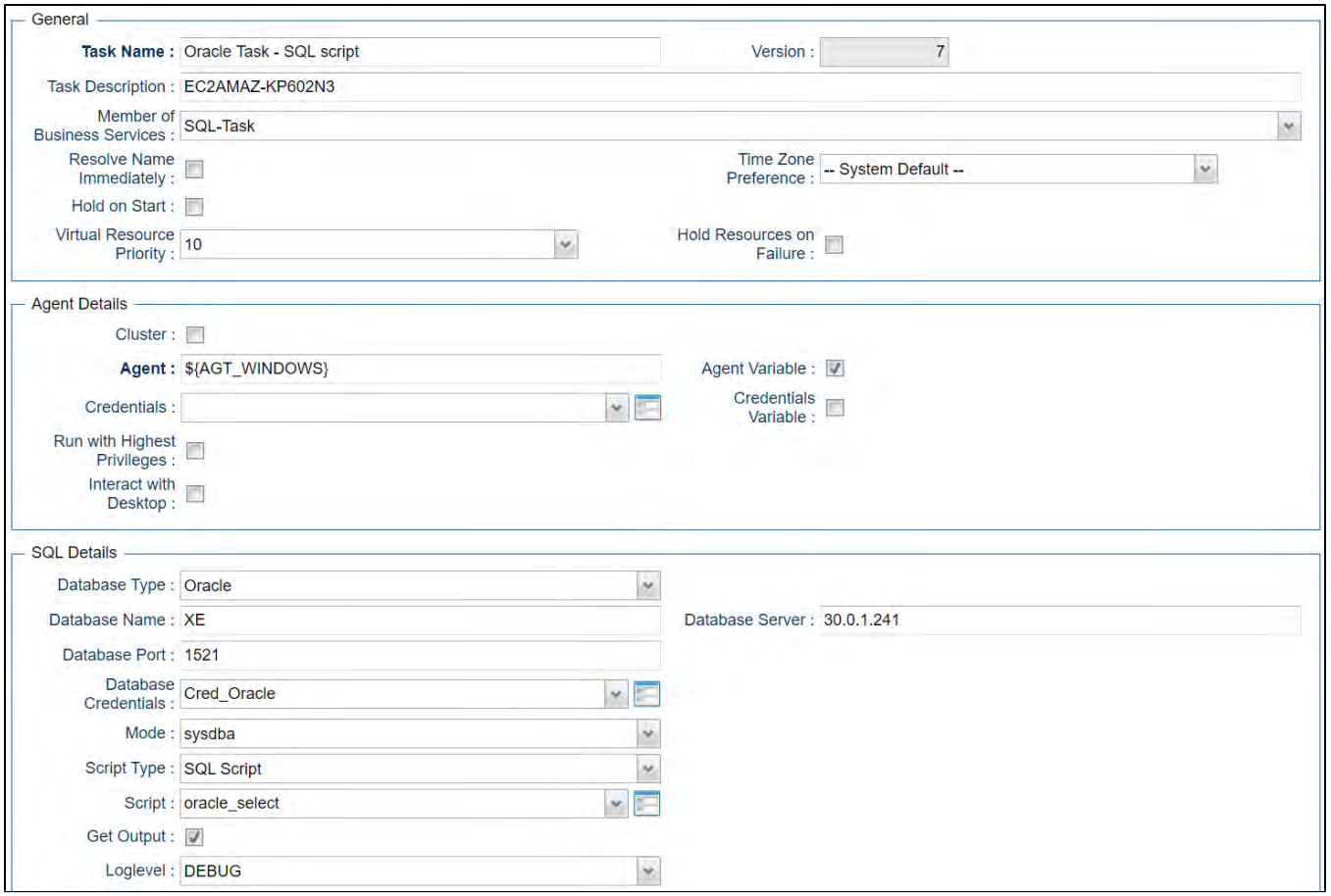
Example: Run a SQL script on MySQL



Database Type: Oracle - SQL

Field	Description
Database Type	Type of database to connect: • MySQL • **Oracle** • PostgreSQL • Microsoft SQL Server • SAP HANA
Database Name	Database name or **oracle service name**
Database Server	Database Servername e.g. localhost
Database Port	Port of the Database e.g. • MySQL: 3306 • **Oracle: 1541** • PostgreSQL: 5432 • Microsoft SQL Server: 1433 • SAP HANA: 39013
Database Credentials	Database Connection Credentials
Mode	Connection Authorization Mode: [sysdba | sysasm | sysoper | sysbkp | sysdgd | syskmt | None] The field is only relevant oracle connections
Script Type	The field is only relevant for oracle connections [**SQL Script** | PL/SQL Block] • **SQL Script - select to execute an SQL Script** • PL/SQL Block - select to run an PL/SQL Block
Script	The database script to execute Note: The name should not contain a Universal Controller Variable e.g. script name: *sb-${**ENV**}-proc01* will **not** work, because it contains a variable (${ENV}) in the name.
Get Output	*Prints the SQL output to STDOUT* *In case of an Oracle Stored procedure print the dbms_output to STDOUT.*
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

Example: Run a SQL Script on Oracle - SQL

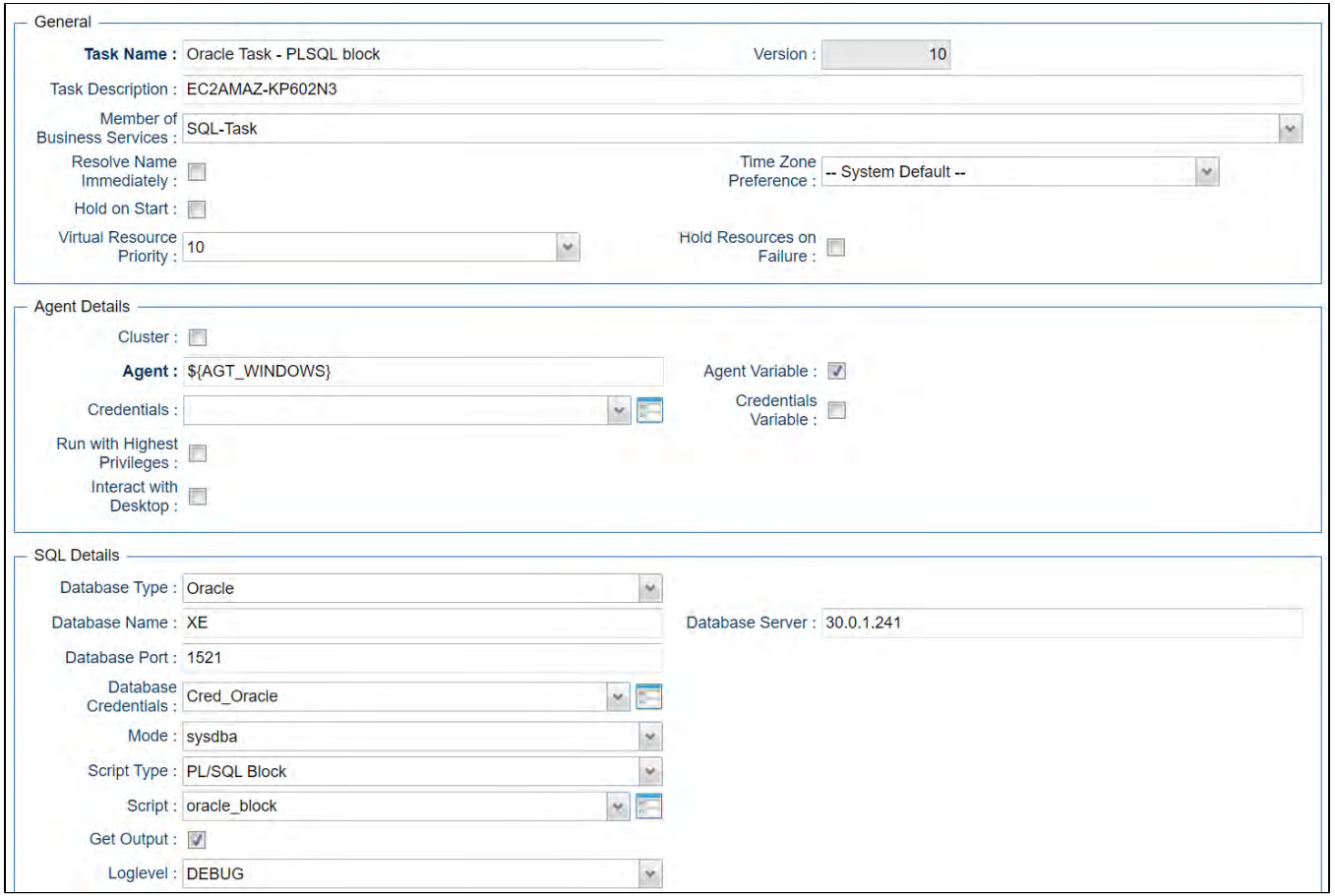


Database Type: Oracle - PLSQL Block

Field	Description
Database Type	Type of database to connect: • MySQL • **Oracle** • PostgreSQL • Microsoft SQL Server • SAP HANA
Database Name	Database name or **oracle service name**
Database Server	Database Servername e.g. localhost

Database Port	Port of the Database e.g. • MySQL: 3306 • **Oracle: 1541** • PostgreSQL: 5432 • Microsoft SQL Server: 1433 • SAP HANA: 39013
Database Credentials	Database Connection Credentials
Mode	Connection Authorization Mode: [sysdba | sysasm | sysoper | sysbkp | sysdgd | syskmt | None] The field is only relevant oracle connections
Script Type	The field is only relevant for oracle connections [SQL Script | **PL/SQL Block**] • SQL Script - select to execute an SQL Script • **PL/SQL Block - select to run an PL/SQL Block**
Script	The database script to execute Note: The name should not contain a Universal Controller Variable e.g. script name: *sb-${**ENV**}-proc01* will **not** work, because it contains a variable (${ENV}) in the name.
Get Output	*prints the SQL output to STDOUT* ***In case of an Oracle Stored procedure print the dbms_output to STDOUT.***
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

Example: Run an Oracle - PLSQL Block

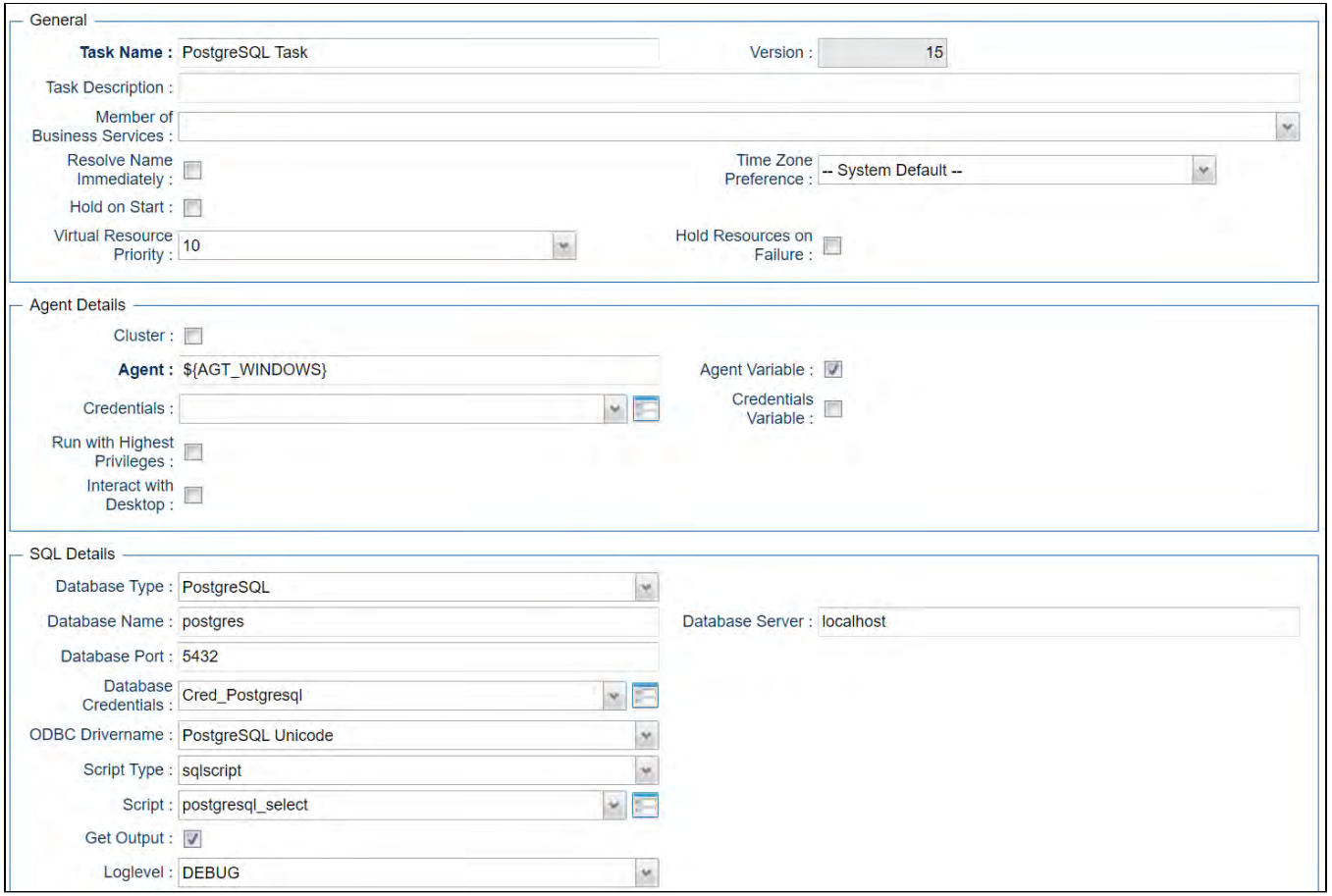


Database Type: PostgreSQL

Field	Description
Database Type	Type of database to connect: • MySQL • Oracle • **PostgreSQL** • Microsoft SQL Server • SAP HANA
Database Name	Database name or oracle service name
Database Server	Database Servername e.g. localhost

Database Port	Port of the Database e.g. • MySQL: 3306 • Oracle: 1541 • **PostgreSQL: 5432** • Microsoft SQL Server: 1433 • SAP HANA: 39013
Database Credentials	Database Connection Credentials
ODBC Drivername	Name of the ODBC driver - the field is only relevant for MySQL, PostgreSQL and Microsoft SQL Server. The following driver are available for selection: • *MySQL: MySQL ODBC 8.0 Unicode Driver* • *MS SQL Server: SQL Server Native Client 11.0,* • *MS SQL Server: ODBC Driver 17 for SQL Server* • ***PostgreSQL: PostgreSQL Unicode*** Additional driver can be added in the SQL Task Universal Template under: *Administration Universal Templates SQL Fields odbc_drivername New*
Script	The database script to execute Note: The name should not contain a Universal Controller Variable e.g. script name: *sb-**${ENV}**-proc01* will **not** work, because it contains a variable (${ENV}) in the name.
Get Output	*prints the SQL output to STDOUT* *In case of an Oracle Stored procedure print the dbms_output to STDOUT.*
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

Example: Run a SQL Script on PostgreSQL

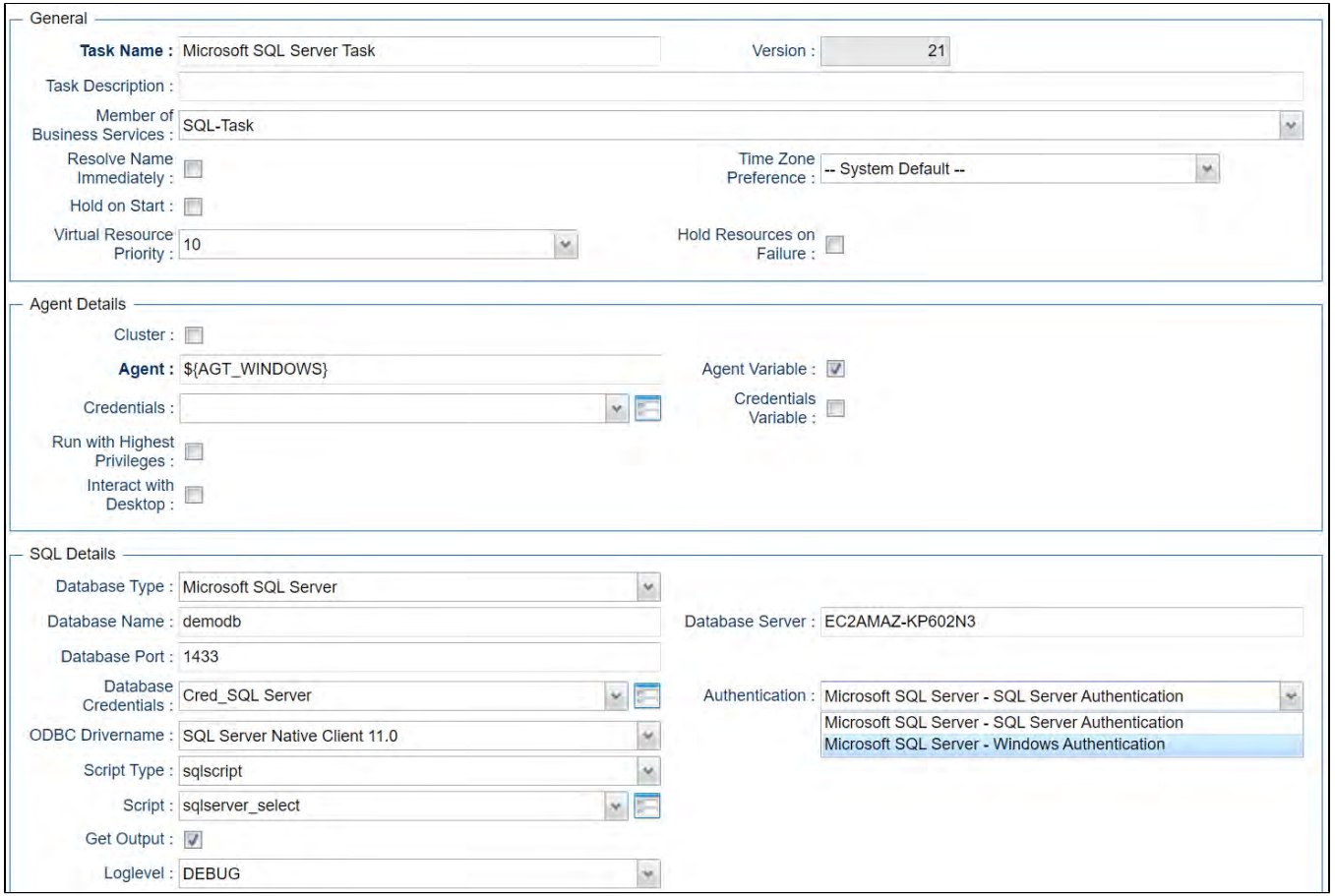


Database Type: Microsoft SQL Server

Field	Description
Database Type	Type of database to connect: • MySQL • Oracle • PostgreSQL • **Microsoft SQL Server** • SAP HANA
Database Name	**Database name** or oracle service name
	Database Servername e.g. localhost

Database Server	
Database Port	Port of the Database e.g. • MySQL: 3306 • Oracle: 1541 • PostgreSQL: 5432 • **Microsoft SQL Server: 1433** • SAP HANA: 39013
Database Credentials	Database Connection Credentials
Authentication	*Supported Methods:* • *Microsoft SQL Server - Windows Authentication* • *Microsoft SQL Server - SQL Server Authentication* Note: If "*Microsoft SQL Server - Windows Authentication*" is chosen you should select under the Agent "Credentials" the Windows user, who should execute the script. The database credentials are not used for SQLSERVER -Windows Authentication.
ODBC Drivername	Name of the ODBC driver - the field is only relevant for MySQL, PostgreSQL and Microsoft SQL Server. The following driver are available for selection: • *MySQL: MySQL ODBC 8.0 Unicode Driver* • ***MS SQL Server: SQL Server Native Client 11.0,*** • ***MS SQL Server: ODBC Driver 17 for SQL Server*** • *PostgreSQL: PostgreSQL Unicode* Additional driver can be added in the SQL Task Universal Template under: *Administration Universal Templates SQL Fields odbc_drivername New*
Script	The database script to execute Note: The name should not contain a Universal Controller Variable e.g. script name: *sb-${**ENV**}-proc01* will **not** work, because it contains a variable (${ENV}) in the name.
Get Output	*prints the SQL output to STDOUT* *In case of an Oracle Stored procedure print the dbms_output to STDOUT.*
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

Example: Run a SQL Script on Microsoft SQL Server

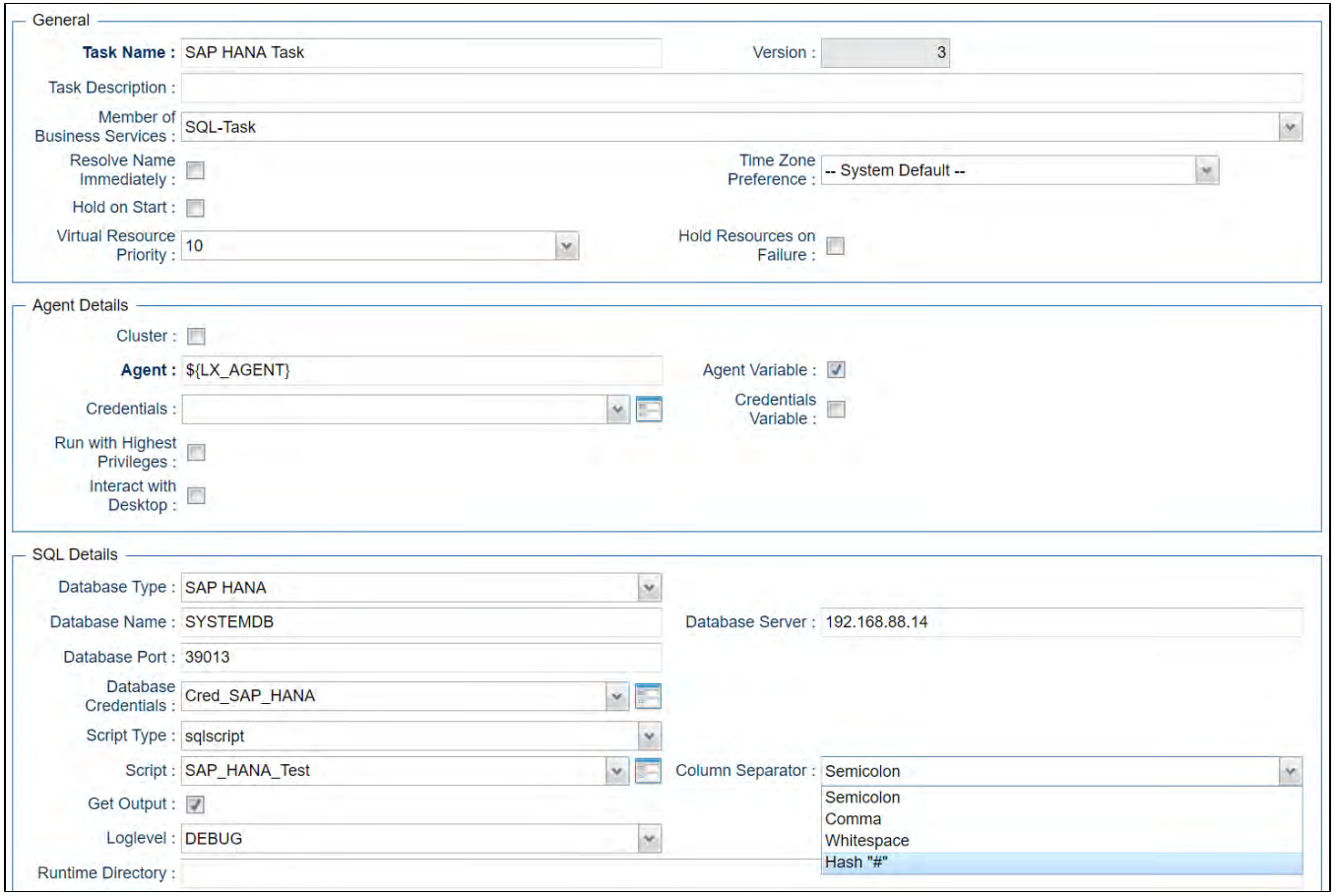


Database Type: SAP HANA

Field	Description
Database Type	Type of database to connect: • MySQL • Oracle • PostgreSQL • Microsoft SQL Server • **SAP HANA**
Database Name	Database name or oracle service name
Database Server	Database Servername e.g. localhost

Database Port	Port of the Database e.g. • MySQL: 3306 • Oracle: 1541 • PostgreSQL: 5432 • Microsoft SQL Server: 1433 • **SAP HANA: 39013**
Database Credentials	Database Connection Credentials
Script	The database script to execute Note: The name should not contain a Universal Controller Variable e.g. script name: *sb-${**ENV**}-proc01* will **not** work, because it contains a variable (${ENV}) in the name.
Column Separator	The field is only relevant for SAP HANA connections Output separator [Semicolon | Comma | Hash | Whitespace]
Get Output	*prints the SQL output to STDOUT* *In case of an Oracle Stored procedure print the dbms_output to STDOUT*.
Loglevel	Universal Task logging settings [DEBUG | INFO| WARNING | ERROR | CRITICAL]

Example: Run a SQL Script on SAP HANA



Document References

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Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
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UiPath for UAC Integration

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- Examples for UiPath Universal Tasks
  - UiPath Sample Universal Task
  - Sample webservices Task for Access Token Generation
  - Generated Access Token can be Stored in a Global Variable by Using the UAC function for the Above webservices Task in Action Set Variable
- Document References

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Introduction

This Universal Task allows Stonebranch users to schedule, trigger, and monitor the UiPath (RPA) process directly from the Universal Controller.

Overview

- This task uses a Python request module to make REST-API calls to the UiPath orchestrator.
- It can trigger the RPA process in UiPath using just UiPath process name, orchestrator base URL, UiPath account name and service instance.
- The task triggers the UiPath process for execution, monitors until process completion, and populates the results in Universal Controller.
- It also features a tight integration with ITSM tools, meaning that it can auto-create incidents in case of UiPath RPA process execution failure.

Software Requirements

This integration requires an Universal Agent and a Python runtime to execute the Universal Task against a UiPath orchestrator instance.

Software Requirements for Universal Template and Universal Task

- Requires Python 3.6 or higher. Tested with the Universal Agent bundled Python distribution.
- Python modules required:
    - requests

Software Requirements for Universal Agent

Either:

- Universal Agent for Windows x64 Version 6.7.0.0 and later with python options installed
- Universal Agent for Linux Version 6.7.0.0 and later with python options installed

Software Requirements for Universal Controller

- Universal Controller Version 6.6.0.0 and later

Software Requirements for the Application to be Scheduled

This Universal Task can work with the following UiPath Orchestrator versions:

- 2020.10.1
- 2020.4.1
- 2019.10.14
- 2018.4.1

Technical Considerations

Please note that the UiPath access token is consumed by this Universal Task from the Global Variable named: Uipath_access_token. You can update the access token periodically through a web services task.

UiPath Key Features

Feature	Description
Trigger a UiPath Job	Trigger a UiPath job/process and monitor the UiPath (RPA) process directly from the Universal Controller.

Import UiPath Built-In Universal Template

To use the built-in Universal Template, you first must perform the following steps:

1. This Universal Task requires the Resolvable Credentials feature. Check that the Resolvable Credentials Permitted system property has been set to **true**.
2. Copy or Transfer the Universal Template file to a directory that can be accessed by the Universal Controller Tomcat user.
3. In the Universal Controller UI, select Configuration > Universal Templates to display the current list of Universal Templates.
4. Right-click any column header on the list to display an Action menu.

5. Select Import from the menu, enter the directory containing the Universal Template file(s) that you want to import, and click OK.

When the files have been imported successfully, the Universal Template will appear on the list.

Configure UiPath Universal Task

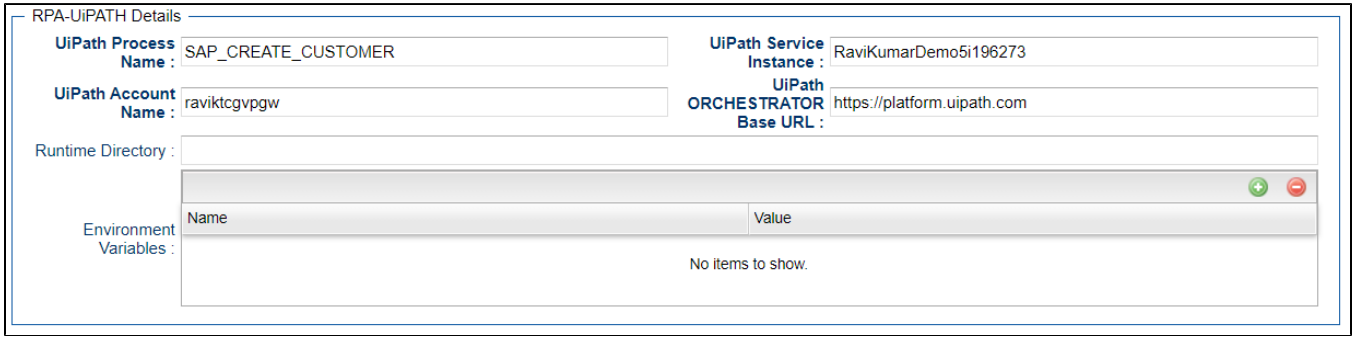
For the new Universal Task type, create a new task and enter the task-specific details that were created in the Universal Template.

Field Descriptions for UiPath Universal Task

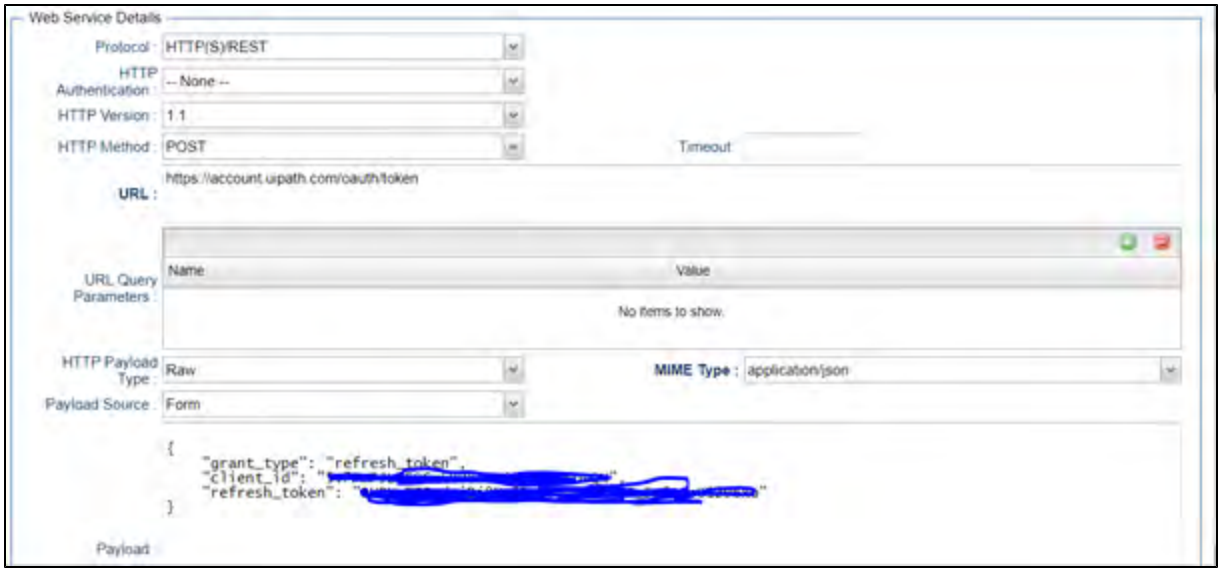
Field	Description
UiPath Process Name	Actual RPA workflow name that needs to be executed by UiPath Bot
UiPath service Instance	Service instance name can retrieve using the Api get: https://platform.uipath.com/cloudrpa/api/account/[account_logical_name]/getAllServiceInstances
UiPath Orchestrator URL	URL for the UiPath Orchestrator where its installed. Normally the cloud orchestrator/Community URL is https://platform.uipath.com:
UiPath Account Name	This is the UiPath Orchestrator Tenant Name: https://platform.uipath.com/cloudrpa/api/getAccountsForUser

Examples for UiPath Universal Tasks

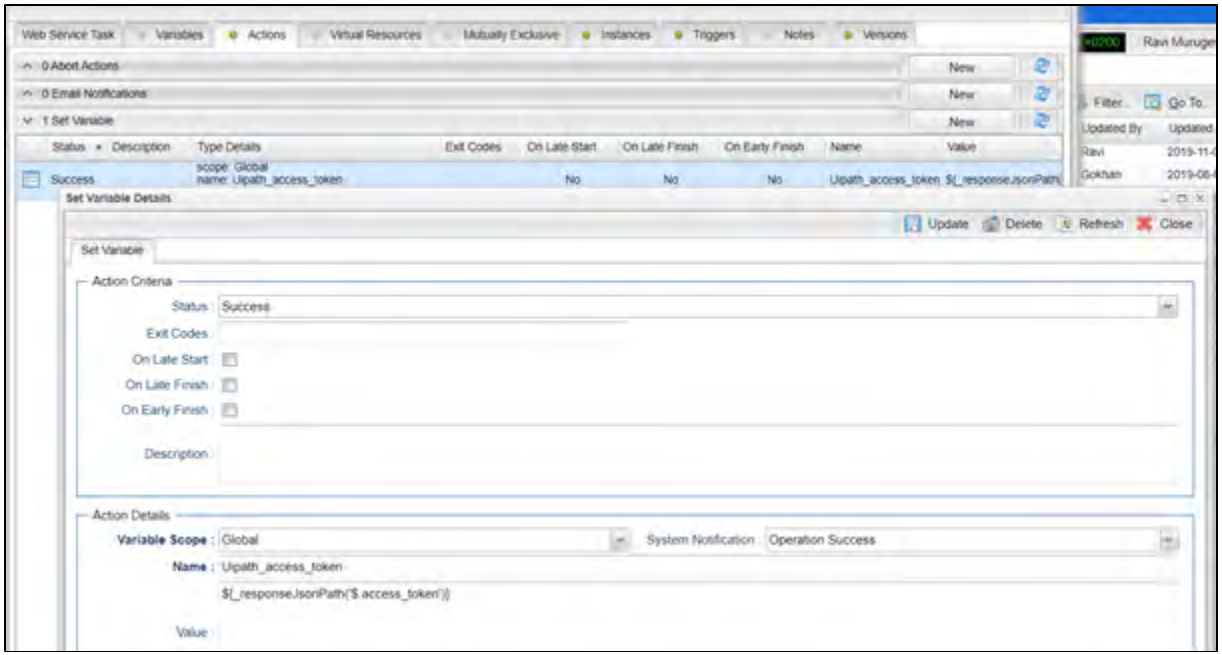
UiPath Sample Universal Task



Sample webservices Task for Access Token Generation



Generated Access Token can be Stored in a Global Variable by Using the UAC function for the Above webservices Task in Action Set Variable



Document References

This document references the following documents:

Name	Location	Description
Universal Templates	https://docs.stonebranch.com/confluence/display/UC70/Universal+Templates	User documentation for creating Universal Templates in the Universal Controller user interface.
Universal Tasks	https://docs.stonebranch.com/confluence/display/UC70/Universal+Tasks	User documentation for creating Universal Tasks in the Universal Controller user interface.